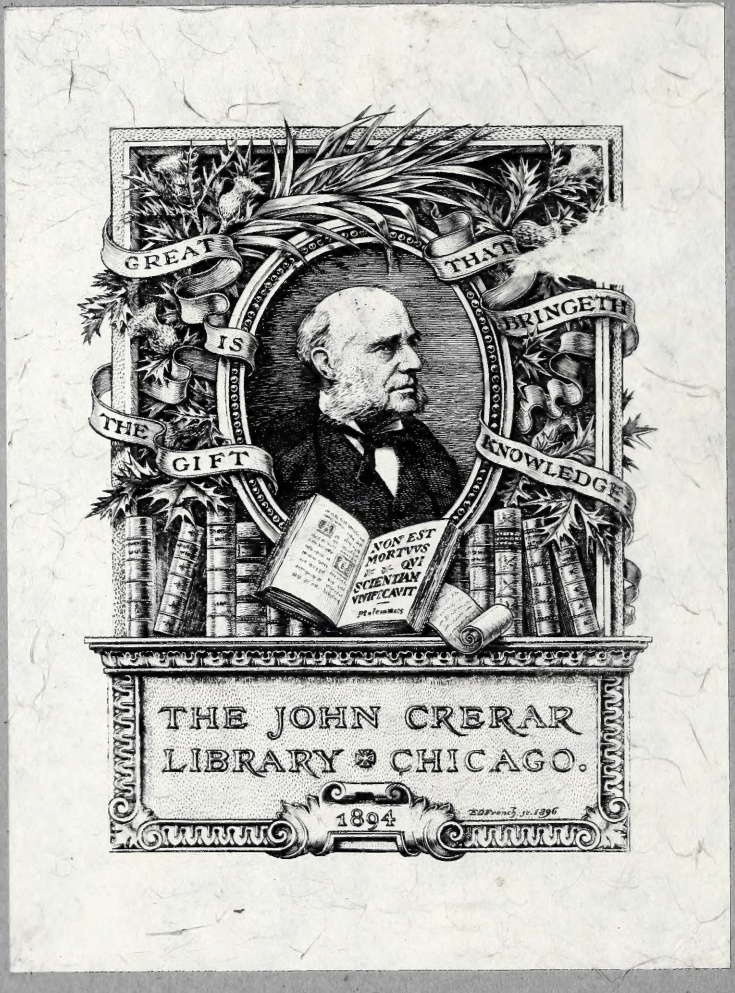
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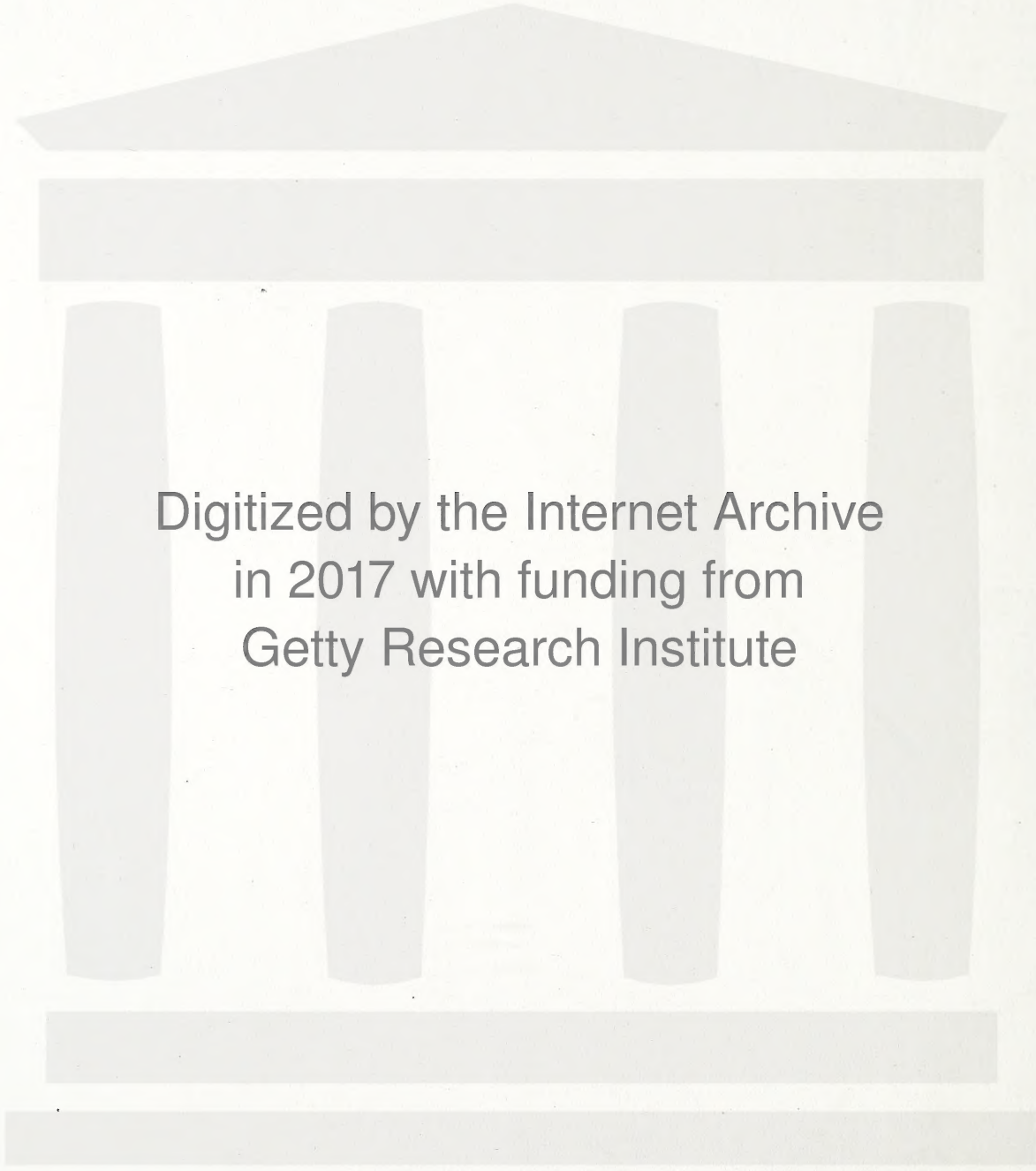
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GETTY MUSEUM RESEARCH

INDEX.

PAGE

"A Blind Leader of the Blind." By Horsley Hinton 741, 759
Accidentally Exposed Plates, Using 211
Albumenised Prints, Silver in. By Edward Dunmore 101
Albumen Paper Prints, The Amount of Silver in. By Herbert S. Starnes 262
Alien Skies. By Hector Maclean 69
Alkalies, The Developing Equivalent of the. By W. B. Bolton 387
Alkalies, The Equivalence of the. By G. E. Brown, A.I.C.... ... ... 295, 376
Alkalies, The Equivalence of the. By W. B. Bolton 326
Aluminium, Lens Mounts in 17
American Notes and News... 196
Ammonia and its Carbonates 434
Ammonium Carbonate Developer. By M. Wilson ... 130, 282, 298
Anti-halation Pads, A Note on. By W. B. Bolton ... 692
"A. P." Jottings. By Leslie Selby ...311, 331, 346, 359
Arrangement of Subject and Point of Sight 545
Art Craze, The. By Walter D. Welford 199
Artificial Atmosphere 145
Artificial Light Portraiture 65
Artigue Papier Velours and Direct Pigment Processes. By A. Maskell, F.S.A. 788
Asphaltum and Etching. By C. B. Talbot 11
Astigmatism, what it is and what it does 129
"Auto, Ortho, Chromatic" 345

Bacteria in Gelatine 632, 663
Battle of the Baths, The 482
Bichromate Infection, The. By J. F. Sachse ... 553
Binary Pictures 561
Book Illustrations, Photographs for. I. and II. By T. N. Armstrong 613, 631
Brin's Oxygen Works, A Visit to. By A. D. F. ... 697
Brown versus Lancaster 523
Burnished or Matt-surface Pictures 715
Business Topic, A 705

Camera and its Adjustments, The. By Walter C. Boyce... 492
Camera Club Conference 231
Camera in the East, The. By J. W. Hadfield ... 521
Carbonates 193
Carbonates in Development, A Point in the Use of 498, 515
Carbon Jottings. By Leslie Selby 742, 757
Carbon Printing, Installation of. By E. W. Foxlee... 38
Carbon Printing Notes. By W. B. Bolton 294
Carbon Printing without Transfer 769
Carbon Transparencies. By S. Herbert Fry 295
Caustic Alkalies versus Carbonates 226
Cause of "Devils" or Pits in Photo-engraved Copper Plates. By E. Sanger Shepherd 263
Celluloid Films, The Keeping Qualities of 459
Changing the Stop. By Edwin C. Middleton ... 743
Children's Portraiture. By Arthur Hands 167
Chino-Japanese War, Photography in the. By Shyozabaro Totani 593
Chloride of Gold and the Acetate Toning Bath ... 275
Cloud Catching 225
Collinear Lens, Voigtlander's 291
Collodio-chloride Paper 657
Collodio-chloride Paper. By J. H. Harvey 378
Collodio-chloride Paper, On the Preparation of. By G. H. Moss 503
Collodion Emulsion, Notes on. By W. B. Bolton ... 820
Collotype, Art and Practice of. By Wm. A. Denovan 215
Collotype Plant and its Cost 289
Colour Photography 599

PAGE

Colour Photography. By F. E. Ives 103
Colour (?) Photography. By Julius F. Sachse ... 773
Colour Photography, Lippmann's Process of. By R. Child Bayley 342
Colour Process, Gelatine Emulsion for the Lippmann 353
Colours, Photography in. By E. J. Wall ... 470, 484
Colour-sensitive Plates and Screens, A Note on. By E. J. Wall 375
Colours, The Action of Light on 355
Colour Values, The Correct Rendering of. By Hall Edwards, L.R.C.P. 230
Colour Values, The Influence of Orthochromatic Plates and Yellow Screens on. By J. H. Baldock, F.C.S. 70
Combining Negatives 18
Coming Exhibition, The 58
Commercial Collotype 242
Comparison of the Spectroscopic and Photographic Examination of Dark-room Illumination. By J. H. Baldock, F.C.S., and A. Roods, F.S.I. 805
Composite Photographs 82
Continental Notes and News 195
Convention, Photographic, of the United Kingdom... 360
Convention Possibilities 369
Convention, The :—
Camera, The, as an Aid to Technical Instruction, with Special Reference to Photo-micrography. By F. R. Armytage 470
Interference Colour Photography 473
Photography in Colours. By E. J. Wall ... 474, 484
Pictorial Photography, The Old and New. By Alfred Maskell, F.S.A. 471
President's Address 453
Toning and Fixing Gelatino-chloride Prints. By C. H. Bothamley 468
Copying Drawings, Iron Processes for. By Thos. A. Scotton 822
Copyright Action, Another Successful 449
Copyright Decision, Important 312
Copyright Decisions 210
Copyright in Photographs. By E. J. Richards ... 89
Copyright Law in Practice 50
Copyright Matters from the Owner's Standpoint ... 625
Copyrights, The Enjoyment of 593
"Cosmos" at the Convention. By "Cosmos" ... 476
Critics. By Abraham Bogardus 519
Crucial Focussing by Eyepieces 337
Cycling and Photography. By E. H. Bayston ... 214

"Daily Chronicle's" Attack of Photographic Hysterics, The 635
Decadents and the Salon. By Apς 101
Decomposition of Gelatine Films, The 546
Decomposition of Sodium Thiosulphate, The 258
Defective Negatives, Suggestions for Improvement of. By J. Von Norath 515
Defective Skies 674
Defence of Photographic Copyright, The 753
Definition, Softness in. By Edward Dunmore ... 296
Definition, Softness of. By J. K. Tulloch, M.B. ... 343
Dennis Taylor New Lens, The 353
Developing Orthochromatic Plates 753
Development and Fixing. By James Cadett 133
Development by Means of Nascent Hydrogen. By W. B. Bolton 660
Development, Control in—A Reply to Mr. Edwards. By Alfred Watkins 132
Development, Controlling Over-exposure and Obtaining Density in. By W. E. Debenham 677
Does Marriage Cause Likeness? By Geo. C. Rockwood 827
Doings at the Camera Club 695, 773

PAGE

Double-coated Films for Process Work 818
Dramatists' Photography. By T. C. Hepworth, F.C.S. 808
Dry-plate Films, Want of Homogeneity in 338
Dry-plate Making, Extemporised 321
Dry Plates for Half-tone Work 665
Dry Plates for Process Work 406
Dry Plates, Preparing, in Daylight 481

Edinburgh Photographic Chemists and the Poisons Act 634
Editorial Table :—
Adams and Co.'s *Photographic Annual for* 1895-96 283
Adams's Popular Pantascope 728
Amateur Photography: How to become a Successful Photographer 778
A New Lens... 44
Anti-halation Backing Pads, Wratten's 524
Art Photography 524
"Barnet" Platino-matt Bromide Paper 121
Belgian Dry Plates, Guequier's 333
Binocular Camera, How to Use the 171
Birds, Beasts, and Fishes of the Norfolk Broads. By P. H. Emerson, B.A., M.B., M.R.C.S., &c ... 233
Burton's *Modern Photography* 152
Camera Club Interchangeable Album 233
Collodio-chloride Paper, Formstecher's 58
Collodio-chloride Paper, The Piget Prize 588
Convention Photographs 539
Cooke Lens, The 589
Cyclopædic Photography 184
Developers and Developing 152
Developers: their Use and Abuse 184
Dictionary of Photography 379
Film and Plate-holder combined 152
Fitch's Films 379
"Fram" Dark Slides for Cut Films 698
"Gem" Dry Plates 411
Graphic Prize Pictures 90
Hand-book of Illustration 121
Hesekiel's Grain Bromide Paper 152
Higgins' Photo Mounter 699
Hintokinone 715
Holborn Restaurant, Illustrated 268
Imperial Flashlight Plates 300
Instantaneous Photography 682
Lantern Slides: their Production and Use 136
Law of Copyright in Designs 364
Lens Work for Amateurs. By Henry Orford ... 59
Letts's *Photographic Diary* 12
Lighting in Photographic Studios 184
Lumière's Tribasic Phosphate of Sodium 283
Mariona 29
Moonlight Lamp, The 397
Mounting Prints by Rule 268
Movement 682
Paragon Focusser 251
Perfection Lime Case 643
Photographic and Optical Electric Lamps 442
Photographic Lenses, How to Choose and How to Use 121
Photographic Lenses, New Catalogue of J. H. Dallmeyer's 136
Photographic Supplements to the *Graphic* 59
Photography: Artistic and Scientific 649
Photogravures, Rembrandt 300
Picture-making by Photography 75
Platinotype 636
Presto Paper, The 792
"Primus" Glass-cleaning Apparatus 793
"Primus" Magnum Finder 420
Primus Stereoscopic Attachment 569
Process Work Year-book 301
Queen Films, Austin Edwards 4
Retouching Medium, Harold Baker's... 12
Round the World 29
Science and Practice of Photography, Introduction to the 285
Shadowit 17
Skate Blade Print Trimmer 66
Strand Magazine 59, 121
Thomas's Antihalation Plates 22
"Three Swans" Collodio-chloride Paper, The ... 74
"Venus" combined Toning and Fixing Bath ... 52
Venus Paper, The 37
Watch Exposure Meter, The Watkins' 34
Workshop Receipts. By Ernest Spon 1
Wratten's Ordinary Plates 77
Wratten's Sensitised Albumenised Paper 26
Election Portraiture... 45

GETTY CENTER LIBRARY

PAGE

Emulsion Films, Line Reproductions on 786
Emulsion Photography, The Invention of 353
Enlarged Negatives. By W. B. Bolton... 451
Enlargement. By E. H. Micklewood 678
Enlargements, Apparatus for. By J. Pike ... 7, 42
Enlargements by way of Enlarged Transparencies ... 801
Enlarging Apparatus, Our. What to do with it. By J. Pike 297
Essentials to Success in Photography, A Few. By T. N. Armstrong VI., 299; VII., 441; VIII., 488; IX., 537; X., 550
Examination in Photography, The City and Guilds Institute 570
Examination of Photographic Lenses, The. By J. R. Gotz 281
Exhibition, Photographic, at the Imperial Institute 305, 332

EXHIBITIONS :—
Agricultural Hall 424
Birmingham and Midland Institute 58
Birmingham Photographic Society 313
Bournemouth Photographic Society 111
Brixton and Clapham Camera Club 220
Glasgow and West of Scotland Amateur Photographic Association 12
Hackney Photographic Society 762
Leeds... 615
Leicester 120
Leytonstone Camera Club 777
Liverpool Spring 183
North Middlesex 776
Photographic Society of Ireland 119
Royal Aquarium 493
Royal Cornwall Polytechnic 620, 633
Royal Photographic Society 423, 628
Stanley Show 761
Wemyss Bay Amateur 41
West London Photographic Society 333, 697
Woodford Photographic Society 809

Experiments with Formalin: Washing Negatives with Boiling Water 257
Explosion of an Oxygen Cylinder 201
Exposure, A Note on. By F. B. Taylor 535

Fading of Pigments, Means for Mitigating the. By Captain Abney, C.B., F.R.S. 361
Filmax Hand Camera, The 504
Films and How to Work them. By J. Pike 723
Fixing Bath, The Economic Use of the... 706
Focussing a Lantern Projection 529
Focussing and Retouching, Optical Aids to 513
Focussing Finder, A Telescopic 385
Focussing with Non-aplanatic Lenses. By W. E. Debenham 483
Foregrounds with Lenses of Flat Field... 241
Foreign and British Photogravure 578
Formaldehyde, Some Reactions of. By T. H. Lee ... 632
Formalin, Photo-medical Notes on. By R. H. Cunningham 406
Frena Film Holder, The 314
Frena, The, No. 2 170
Future of Photography, The. By Hector E. Murchison 823

Garden and Greenhouse Portraiture 577
Gas Cylinder Explosion, The 232
Gelatine and Alum 610
Gelatine Films, Washing in Hot Weather 434
Gelatine Papers, A Continuous Toning Bath for 402, 419
Gelatine Prints, The Treatment of 466
Gelatine Negatives, Methods of Stripping 632
Gelatino-chloride Papers, Suggestions in Connexion with. By W. B. Bolton 213
Gelatino-bromide Plates, On the Sensitising Action of Dyes on. By C. H. Bothamley, F.I.C., F.C.S. ... 727
Gelatino-chloride Prints, Points on Toning and Fixing. By C. H. Bothamley 468
Gelatino-chloride up to Date. By W. Lindsay ... 373
Genre Work and its Future. By G. B. Sperry ... 697
Gold in Photography 529, 562
Gold Sulphides and Sulphocyanides 338
Gwynne's New Double-carbon Electric Lamp ... 507

Half-tone Blocks, The Printing of 727
Half-tone Engravings by the Enamel Process. By R. Whittet 572, 584, 600
Half-tone Theory, The 392
Hand Camera and Hand-camera Workers, The. By S. L. Coulthurst 824
Hand Camera, The—Then and Now. By Walter D. Welford... 54
Hand-camera Work, Notes on. By W. Thomas ... 458
Heating Studios 115
Heavenly Bodies, Photographing the, by an Ordinary Camera 417

PAGE

Heliogablotype, The. By J. Focus Snappschotte ... 680
How I was Nearly Had 614
How to Change and Develop the most Rapid Dry Plates in an Ordinary Room. By J. T. Hackett ... 808
How to Find Negatives 809
Hyposulphite of Soda, A Note on. By Edward Dunmore 549

Ilford Matt P.O.P., Platinum Toning of 73
Illumination of a Photograph, Equalising the ... 177
Intensification of Process Negatives, The 594
Intensification, The Choice of Methods in 642
Intensity First or Detail? 179
Invisible Photographic Image, The Destruction of the 690
Iron in Platinum Prints 709
Is Hand Work Legitimate on Process Blocks and Photogravure Plates? 641

Jottings. By Cosmos 21, 52, 85, 116, 149, 181, 208, 260, 292, 336, 371, 405, 437, 500, 532, 580, 596, 644, 676, 708

Kinetoscope, Who is the Inventor of the? By A. T. Story 772

Laboratory Notes and Notions. By E. Banks 390, 489, 647
Lantern Prospects 497
Lantern-slide Making 664
Lantern-slide Making, Processes for 673
Lantern Slides Pictorially Considered. By J. K. Tullock, M.B. 309
Large Paper Negatives 609
"Lay Figure, The," and Photography. By the Lay Figure in the *Studio* 633

LEADERS :—
Accidentally Exposed Plates, Using 211
Aluminium, Lens Mounts in 17
Ammonia and its Carbonates 434
Arrangement of Subject and Point of Sight ... 545
Artificial Atmosphere 145
Artificial Light Portraiture 65
Astigmatism, what it is and what it does 129
Battle of the Baths, The... 482
Binary Pictures 561
Business Topic, A 705
Carbonates 193
Carbonates in Development, A Point in the Use of 498, 515
Carbon Printing without Transfer 769
Caustic Alkalies *versus* Carbonates 226
Chloride of Gold and the Acetate Toning Bath ... 275
Cloud Catching 225
Collodio-chloride Paper 657
Collotype Plant and its Cost 289
Colour Process, Gelatine Emulsion for the Lippmann 353
Colours, The Action of Light on 355
Combining Negatives 18
Commercial Collotype 242
Composite Photographs 82
Convention Possibilities 369
Copyright Action, Another Successful 449
Copyright Decisions 210
Copyright Law in Practice 50
Copyright Matters from the Owner's Standpoint ... 625
Copyrights, The Enjoyment of... 593
Crucial Focussing by Eyepieces 337
Decomposition of Gelatine Films, The 546
Decomposition of Sodium Thiosulphate, The ... 258
Defective Skies 674
Defence of Photographic Copyright, The 753
Developing Orthochromatic Plates 753
Double-coated Films for Process Work 818
Dry-plate Films, Want of Homogeneity in 338
Dry-plate Making, Extemporised 321
Dry Plates, Preparing, in Daylight 481
Emulsion Films, Line Reproductions on 786
Emulsion Photography, The Invention of 353
Enlargements by way of Enlarged Transparencies. 801
Exhibition, Photographic, at the Imperial Institute 305
Experiments with Formalin: Washing Negatives with Boiling Water 257
Fixing Bath for Positive Prints, The... 274
Fixing Bath, The Economic Use of the 706
Focussing a Lantern Projection 529
Focussing and Retouching, Optical Aids to 513
Focussing Finder, A Telescopic 385
Foregrounds with Lenses of Flat Field 241
Foreign and British Photogravure 578
Garden and Greenhouse Portraiture 577
Gelatine and Alum 610
Gelatine Films, Washing, in Hot Weather 434
Gelatine Papers, A Continuous Toning Bath for 402, 419
Gelatine Prints, The Treatment of 466
Gold in Photography 529, 562
Gold Sulphides and Sulphocyanides 338
Heating Studios 115
Heavenly Bodies, Photographing the, by an Ordinary Camera 417
Illumination of a Photograph, Equalising the ... 177
Intensification of Process Negatives, The 594
Intensification, The Choice of Methods in 642
Intensity First or Detail? 179
Invisible Photographic Image, The Destruction of the 690

EDITORIAL TABLE (*continued*) :— PAGE
Iron in Platinum Prints 709
Is Hand Work Legitimate on Process Blocks and Photogravure Plates 641
Lantern Prospects... 497
Lantern-slide Making, Processes for 673
Large Paper Negatives 609
Lenses, Achromatic *versus* Spectacle 81
Lenses, Concerning Jena Glass for 33
Lenses, Large Apertures for Landscape 1
Lenses Old and New 209
Lighting, A Note on 433
Lightning, Photographing 516
Lightning, The Actinic Value of 516
Line Subjects, Developing Gelatine Negatives of 18, 34
Line Subjects, Intensification of Gelatine Negatives of 51
Mechanical *versus* Chemical Methods of Improving Negatives 737
Metoquinone Developer in Winter 2
Mountants, Photographic 322
Mounting Prints of Large Dimensions 592
Naturalistic Focussing 113
New Light for Photographers—Important Discovery 49
New Stereoscopic Attachment to the Camera, A ... 273
Oil Paintings, Photographing 370, 402
Ownership of Negatives 114
Ownership of Negatives: A Trade Question ... 146
Partially Printed Proofs, Development of ... 66, 82
Photo-chromy as it is 514
Photographers as Draughtsmen: The Camera Obscura 401
Photographic Perspective and the Critics 689
Portraiture, Artistic Backgrounds in... 97
Portraiture, The Swing Back in 98
Practical Expedients in Connexion with Emulsion Films for Process Work 802
Press, Photography for the 1
Printing Papers with Glossy Surfaces 305
Prints, Gelatine Finished 323
Print Washing 148
Process Blocks and the Illustrated Press 546
Process Negatives, The Intensification of 626
Professional Portraiture—A Business Matter ... 385
Pyrosulphite's Yellow Stain 34
Rendering the Carbonates Caustic for Development 578
Residue Collecting, Some Practical Aspects of ... 242
Residues from Fixing Baths 530
Retouching Surfaces 290
Reversal of the Image, Another Phase of 243
Reversed Negative Process in Practice, The ... 770
Reversed Negatives on Gelatine Plates 722
Reversed Negatives on Wet Plates 738
Reversed Negatives, Prisms and Negatives for ... 418
Salon, The Photographic 611
Sayce, B. J., The late 340
Single Lenses, A Useful Application of 161
Spots, Recent Experiences in 306
Stereoscopic Pictures, Combining Badly Mounted... 449
Stereoscopic Slides for the Million 721
Studio Building, Practical Hints on 178
Subjects, Photographing Abnormally Lighted ... 146
Thunderstorms on Gelatine Plates, The Effect of... 516
Time Development 162
Traill Taylor, The late Mr. J. 725
Transferring Films while Wet 785, 817
Uneven Toning 211
Use of the Swing Back in Photography 658
Varnishing Difficulties 499
Wholesale Developing 465

Lenses, Achromatic *versus* Spectacle 81
Lenses, Concerning Jena Glass for 33
Lenses for Process Work 664
Lenses, Large Apertures for Landscapes 1
Lenses, Old and New 209
Lick Telescope 136
Liesegang's Collodion Transfer Paper. By K. Isawa 806
Lighting, A Note on ... ...
Lightning, Photographing 516
Lightning, The Actinic Value of 516
Line Subjects, Developing Gelatine Negatives of 18, 34
Line Subjects, Intensification of Gelatine Negatives of 51
Lippmann Process, Emulsion for the. By R. Child Bayley 388

Manxland, A Holiday in. By W. Fenton-Jones ... 554
Marvellous Printing Method, A. By D. Bachrach ... 694
Mechanical Aids in Print Washing. By W. B. Bolton 581
Mechanical Development. By F. S. Lewis 43
Mechanical *versus* Chemical Methods of Improving Negatives 737
Medal and Muddle. By Hector Maclean 38
Method in Photography. By W. F. Miller ... 634, 649
Metoquinone Developer in Winter 2
Microscopy, on the Use of Coloured Light in. By A. M. Edwards, M.D.... 505
Mirrors 28
Modern Illustration, Some Aspects of. By Gleeson White... 484
Modern Solutions, More Notes on the Use of. By J. Pike 807
Modified Emulsion, Further Notes on a. By Edwin Banks 165
"Monococoylmetadihydroxylbenzolzirconallylauromethylphtalein." By G. Watmough Webster, F.C.S. 326

L770.52 183263 4616C

PAGE

Moselle, The: A Continental By way. By an Itinerant Photographer 534, 587
Mountants, Photographic 522
Mounting Prints of Large Dimensions 552
Moving Objects and Pictorial Photography. By H. W. Bennett 425, 438
Mr. H. P. Robinson and the Convention 505
My Business Methods. By B. L. H. Dabbs 698

National Association of Professional Photographers 728
Natural and Artificial Light, The Combination of .. 571
Natural Colours, A Method of Photography in ... 774
Naturalistic Focussing 113
Negatives and Prints, Various Methods of Improving. By Edward Dunmore 9
New Light for Photographers—Important Discovery 49
New Printing and Enlarging Works at Twickenham 442
News and Notes 461
Newspaper Illustrations. By Thomas Wakeham Lane 329
New Sport, A 523
New Stereoscopic Attachment to the Camera, A ... 273

Official Photographic Company of the Cotton States Exposition... 681
Oil Paintings, Photographing 370, 402
Old South London Photographic Society, Annals of the. By Frank Howard... 304
Old-time Negative Processes. By John C. Brown ... 409
One Thing, The. By J. M. Appleton 619
Orthochromatic Photography, Remarks on. By Dr. J. M. Eder 791
Orthochromatic Photography with Ordinary Plates. By F. E. Ives 517
Our Enlarging Apparatus and what to do with it. By J. Pike 246
Outside Specimen Display as a Business Persuader, The. By John A. Tennant 619
Ownership of Negatives 114
Ownership of Negatives: A Trade Question 146

Paris Photographic Club, The Exhibition of the. By Alfred Maskell 341, 374
Partially Printed Proofs, Development of ... 66, 82
Pharmaceutical Society, The, and Photographic Chemists 713
Phosphorescence of Gelatine Plates. By R. Neuhauss 728
Photo-chemical Notes. By G. E. Brown, A.I.C. 88, 219, 264, 565, 823
Photo-chromy as it is 514
Photo-engraving, Mercurographic Methods of. By Thomas Bolas, F.I.C , F.C.S. 553
Photo-engraving, the Use of Dry Plates in. By John Carbutt 518
Photo-etching, A Simple and Practical Process. By W. B. Bolton 99
Photographic Colour Printing, Remarks on. By William Hume 25
Photographic Convention of the United Kingdom 397, 452, 463, 471, 473, 474, 620, 649
Photographers as Draughtsmen: The Camera Obscura 401
Photographers' Copyright Union Annual Meeting ... 760
Photographic Copyright and the Illustrated Press ... 555
Photographic Copyrights 583
Photographic Critics Criticised. By Thomas Bedding 278
Photographic History, Some Forgotten Pages of. By W. H. Harrison 55
Photographic Impressions and Finger-posts. By Hector Maclean, F.G.S., F.R.P.S. 755
Photographic Lenses, The Examination of. By J. R. Gotz 264
Photographic Mordants. By Jean Helouis and Saint-Père 824
Photographic Naturalist, The. By J. Vincent Elsden 24, 41, 71, 440, 457
Photographic Perspective and the Critics 689
Photographic Printing by Machinery 551
Photographic Telescope Equatorially Mounted, Description of a. By Prof. J. M. Schraberle 665
Photographing Lightning. By W. N. Jennings ... 392
Photographs, Good *versus* Bad. By Technique. ... 344
Photographs of the Moon taken at the Paris Observatory 584

PAGE

Photography, A Few Essentials to Success in. By T. N. Armstrong 6, 72, 102, 198, 245
Photography: Practical and Artistic. By Wm. F. Miller 616
Photogravure Methods, Modern. By Horace Wilmer 216
Photogravure, Prize for 378
Photology. By J. Vincent Elsden 744
Photo-mechanical Notes. By William Gamble 245, 328, 407, 456, 549, 662, 790
Photo-mechanical Work in Japan. By W. K. Burton 86
Photometric Standard, the New. By F. B. Grundy 391
Photo-micrography at the Antipodes 538
Photo-micrography, The Camera as an Aid to Technical Instruction, with Special Reference to. By F. R. Armytage, M.A. 470
Photo-process Work. By John Hislop 102
Pictorial Treatment of Landscape. By H. H. Mummery 709
Pigeon Post, Micrographic Dispatches during the Siege of Paris, 1870–71 740
Pinhole Photography. By Y. Isawa 421
Plain Salted Silver Paper, The Preparation of. By G. H. Moss 507
Platinotype Printing, Some Remarks on. By Valentine Blanchard 562
Platinotype Prints, The Reduction of, by Nitro-hydrochloric Acid... 88
Platinous Salts for Photographic Use, A Method of Preparing. By J. Vincent Elsden 248
Platinum Black to Sepia and Vandyke. By Hector Maclean 135
Platinum Prints, Changes that they are Liable to. By Chapman Jones, F.I.C., F.C.S. 357
Platinum Toning: Mr. J. Kidson Taylor's Method ... 268
Portraiture, Artistic Backgrounds in 97
Portraiture, The Swing Back in 98
Practical Expedients in Connexion with Emulsion Films for Process Work 802
Practical Photography, Colour Screens in. By F. H. Burton 821
Press, Photography for the 1
Printing and Toning Rooms, The. By C. L. Weed ... 714
Printing Frames, An Idea in 551
Printing-out Papers in Practice. By J. Pike ... 501
Printing-out Papers, The Stability of. By Dr. Maximilian Toche 712
Printing Papers with Glossy Surfaces 305
Printing Process, A Promising. By Hector Maclean, F.G.S. 389
Printing Processes, Photo-mechanical. By Ernest Edwards 105
Prints, Gelatine Finished 323
Prints, Toning Platinum. By A. W. Dollond ... 134
Print Washing 148
Process Blocks and the Illustrated Press 546
Process Engraving 491
Process Negatives, The Intensification of 636
Process Work, Collodion Emulsion for. By W. B. Bolton 36
Professional Portraiture—A Business Matter ... 386
Pyrosulphite's Yellow Stain 34

Quantity of Silver in Photographic Preparations, Method for Rapidly Determining the. By Prof. Alexander Lainer 11

Reactions accompanying the Decomposition of Sodium Thiosulphate in Fixing Photographic Plates. By MM. Seyewetz and G. Chicandard 249
Rendering the Carbonates Caustic for Development 578
Reply to Mr. Watkins. By B. J. Edwards 133
Residue Collecting, Some Practical Aspects of ... 242
Residue Jar, The Genesis of a. By G. Watmough Webster, F.C.S. 597
Residues from Fixing Baths 530
Residues from P.O. Papers. By J. Pike 487
Retina, Photography of the 555
Retouching Surfaces 290
Reversal of the Image, Another Phase of 243
Reversed Negative Process in Practice, The 770
Reversed Negatives on Gelatine Plates 722
Reversed Negatives on Wet Plates 738
Reversed Negatives, Prisms and Negatives for ... 418
Rough Surface Papers. By J. Watson 745

PAGE

Royal Photographic Society 645
Royal Photographic Society's Exhibition. By Dr. P. H. Emerson 169

Salon, The Photographic 611
Sayce, B. J. By W. B. Bolton 340
Sayce, The late B. J. 340, 588
Screen, The, and its Effect. By W. B. Bolton ... 151
Screen, The, and its Effects. By E. C. Middleton ... 118
Screens. By Edwin C. Middleton 182
Seasonable Novelties 232, 426, 459
Self-lighting Gas-burner 457
Shrewsbury Convention, Delegates' Report of the. By J. S. Teape 548
Shutters, Simple Apparatus for Testing the Speed of 113
Silver in Solarised Albumen Paper. The Amount of. By A. Haddon and F. B. Grundy 68
Simple Subjects and their Treatment 119
Singapore Forts, Photographing... 396
Single Lenses, A Useful Application of... 161
Sizes of Plates and Paper. By W. B. Bolton... ... 262
Small Quantities of Developers, Arrangement for Drawing Off. By Wilson Noble 229
Sodium Thiosulphate, Tests for. By Matthew Wilson 490, 555, 570
Softness of Definition. By Edward Dunmore ... 247
Softness of Definition. By J. K. Tulloch, M.B. ... 280
Solarisation: A Lecture Experiment. By Arthur Richardson 216
Some Facts about Glass 746
Some Idle Thoughts on Photographic Societies. By W. D. Welford 679, 693
Somerset. By Tom Coan 409
Spectroscope, The. By J. J. Stewart, B.A. 538
Spots, Recents Experiences in 306
Stereoscopic Photographs on the Screen 807
Stereoscopic Pictures, Combining Badly Mounted ... 449
Stereoscopic Slides for the Million 721
Studio Blinds and Reflectors. By Edward Dunmore 89
Studio Building, Practical Hints on 178
Studio Furniture and Accessories. By Valentine Blanchard 329
Subjects, Photographing Abnormally Lighted ... 146
Summer Excursion of the N.A.P.P. 395
Sunshine to Shadow and Back. By Hugh Brebner... 22, 166, 197
Supplementary Lenses, The Use of. By A. L. Eidemiller 553

"Technical Examinations" in Photography 347
Tele-photographic Lenses, The Rendering of Photographic detail with. By E. Marriage 661
The late Mr. J. Traill Taylor 725
Things in General. By "Free Lance" 308, 421, 536, 660, 804
Thiosulphuric Acid, On the Decomposition of. By A. F. Holleman 508
Three-colour Process 507
Thunderstorms on Gelatine Plates, The Effect of ... 516
Time Development 162
Tintometer, The 712
Toning and Fixing Baths, Combined *versus* Separate. By A. Haddon and F. B. Grundy 40
Toning Bath for Positive Prints, The 274
Touring "Tips." By John A. Hodges 506
Transferring Films while Wet 785, 817
Transparencies, Collodio-chloride for. By J. S. Teape 24
Trimming and Mounting Photographs. By Edward Dunmore 502
Two New Lenses 807

Uneven Toning 211
Useful Varnish, A. By Hall Edwards, L.R.C.P., &c. 458
Use of the Swing Back in Photography 658

Varnishing Difficulties 499
Wholesale Developing 465
Visit to Messrs. Morgan & Kidd, A 441

Weather Fallacies 66

AUTHORS' INDEX.

PAGE

Abney, Captain, C.B., F.R.S.—
Means for Mitigating the Fading of Pigments ... 361

A. D. F.
A Visit to Brin's Oxygen Works 697

Appleton, J. M.—
The One Thing 619

Armstrong, T. N.—
Photographs for Book Illustrations 613, 631
Photography, A Few Essentials to Success in 6, 72, 102, 198, 245, 299, 441, 488, 537, 550

Armytage, F. R., M.A.—
The Camera as an Aid to Technical Instruction, with Special Reference to Photo-micrography ... 470

Apς—
Decadents and the Salon... 101

Bachrach, D.—
A Marvellous Printing Method... 694

Baldock, J. H., F.C.S.—
The Influence of Orthochromatic Plates and Yellow Screens on Colour Values 70

Baldock, J. H., F.C.S., & Roods, A., F.S.I.—
Comparison of the Spectroscopic and Photographic Examination of Dark-room Illumination 805

Banks, E.—
Further Notes on a Modified Emulsion 165
Laboratory Notes and Notions 390, 489, 647

Bayley, R. Child—
Emulsion for the Lippmann Process 388
Lippmann's Process of Colour Photography ... 342

Bayston, E. H.—
Cycling and Photography 214

Bedding, Thomas—
Photographic Critics Criticised 278

Bennett, H. W.—
Moving Objects and Pictorial Photography... 425, 438

Blanchard, Valentine—
Some Remarks on Platinotype Printing 562
Studio Furniture and Accessories 329

Bogardus, Abraham—
Critics 599

Bolas, Thomas, F.I.C., F.C.S.—
Mercurographic Methods of Photo-engraving ... 553

Bolton, W. B.—
A Note on Anti-halation Pads 692
B. J. Sayce 340
Carbon Printing Notes 294
Collodion Emulsion for Process Work 36
Development by Means of Nascent Hydrogen ... 660
Enlarged Negatives 451
Mechanical Aids in Print Washing 581
Photo-etching: a Simple and Practical Process ... 99
Sizes of Plates and Paper 262
Suggestions in Connexion with Gelatino-chloride Papers 213
The Developing Equivalence of the Alkalies ... 387
The Equivalence of the Alkalies 326
The Screen and its Effects 151
Working Notes on Collodion Emulsion 820

Bothamley, C. H., F.I.C., F.C.S.—
On the Sensitising Action of Dyes on Gelatino-bromide Plates 727
Toning and Fixing Gelatino-chloride Prints ... 468

PAGE

Boyce, Walter C.—
The Camera and its Adjustments 429

Brebner, Hugh—
Sunshine to Shadow and Back I., 22; II., 166; III., 197

Brown, G. E., A.I.C.—
Photo-chemical Notes 88, 219, 264, 565, 823
The Equivalence of the Alkalies 295, 376

Brown, J. C.—
Old-time Negative Processes 409

Burton, F. H.—
Colour Screens in Practical Photography 821

Burton, W. K.—
Photo-mechanical Work in Japan ... ...

Cadett, James—
Development of Fixing 133

Carbutt, John—
The Use of Dry Plates in Photo-engraving 518

Coan, Tom—
Somerset 409

"Cosmos"—
"Cosmos" at the Convention 476

Coulthurst, S. L.—
The Hand Camera and Hand-camera Workers ... 824

Cunningham, R. H.—
Photo-medical Notes on Formalin 406

Dabbs, B. L. H.—
My Business Methods 698

Debenham, W. E.—
Controlling Over-exposure and Obtaining Density in Over-development 677
Focussing with the Non-aplanatic Lenses 483

Denovan, William A.—
Art and Practice of Collotype 215

Dollond, A. W.—
Toning Platinum Prints 134

Dunmore, Edward—
A Note on Hyposulphite of Soda 549
Silver in Albumenised Prints 101
Softness of Definition 247, 296
Studio Stands and Reflectors 89
Trimming and Mounting Photographs 502
Various Methods of Improving Negatives and Prints 9

Edwards, A. M., M.D.—
On the Use of Coloured Light in Microscopy ... 505

Edwards, B. J.—
Reply to Mr. Watkins 133

Edwards, Ernest—
Photo-mechanical Printing Processes 105

Edwards, Hall, L.R.C.P.—
A Useful Varnish 458
The Correct Rendering of Colour Values 230

Eidemiller, A. L.—
The Use of Supplementary Lenses 553

Elsden, J. V.—
A Method of Preparing Platinum Salts for Photographic Use 248
Photographic Naturalist 24, 41, 71, 440, 457
Photology 744

PAGE

Emerson, Dr. P. H.—
On the Royal Photographic Society's Exhibition ... 169

Fenton-Jones, W—
A Holiday in Manxland 554

Foxlee, E. W.—
Installation of Carbon Printing 38

Free Lance—
On Things in General ... 195, 303, 421, 536, 660, 804

Fry, S. Herbert—
Carbon Transparencies 295

Gamble, William—
Photo-mechanical Notes 245, 328, 407, 456, 549, 662, 790

Gotz, J. R.—
The Examination of Photographic Lenses ... 264, 281

Grundy, F. B.—
The New Photometric Standard... 391

Hackett, J. T.—
How to Change and Develop the most Rapid Dry Plates in an Ordinary Room 808

Haddon, A., and Grundy, F. B.—
Combined *versus* Separate Toning and Fixing Baths 40
The Amount of Silver in Solarised Albumen Paper 68

Hadfield, J W.—
The Camera in the East 521

Hands, Arthur—
Children's Portraiture 167

Harrison, W. H.—
Some Forgotten Pages of Photographic History ... 55

Harvey, J. H.—
Collodio-chloride Paper 378

Hepworth, T. C., F.C.S.—
Dramatists' Photography 808

Hinton, Horseley—
"A Blind Leader of the Blind" 741, 759

Hislop, John—
Photo-process Work 102

Hodges, John A.—
Touring "Tips" 506

Holleman, A. F.—
On the Decomposition of Thiosulphuric Acid ... 508

Howard, Frank—
Annals of the Old South London Photographic Society 394

Hume, Wm.—
Remarks on Photographic Colour Printing ... 25

Isawa, Y.—
Liesegang's Collodion Transfer Paper 806
Pinhole Photography 421

Ives, F. E.—
Colour Photography 103
Orthochromatic Photography with Ordinary Plates 517

Jean Helouis and Saint Père—
Photographic Mordants 824

Jennings, W. N.—
Photographing Lightning 392

Jones, Chapman, F.I.C., F.C.S.—
Changes that Platinum Prints are Liable to ... 357

PAGE

Lainer, Prof. Alex.—
Method for Rapidly Determining the Quantity of Silver in Photographic Preparations 11

Lane, Thomas Wakeham—
Newspaper Illustrations 329

Lee, T. H.—
Some Reactions of Formaldehyde 632

Lewis, F. S.—
Mechanical Development 43

Lindsay, W.—
Gelatino-chloride up to Date 373

Maclean, Hector—
Alien Skies 69
A Promising Printing Process 389
Medal and Muddle 38
Photographic Impressions and Finger-posts ... 755
Platinum Black io Sepia and Vandyke 135

Marriage, E.—
The Rendering of Photographic Detail with Telephotographic Lenses 661

Maskell, A., F.S.A.—
Artigue Papier Velours and Direct Pigment Processes 788
Pictorial Photography: the Old and the New ... 471
The Exhibition of the Paris Photo Club 341

Micklewood, E. H.—
Enlargement 678

Middleton, E. C.—
Changing the Stop 743
Screens 182
The Screen and its Effects 118

Miller, W. F.—
Method in Photography 634, 649
Photography: Practical and Artistic 616

MM. Seyewetz and G. Chicandard—
Reactions Accompanying the Decomposition of Sodium Thiosulphate in fixing Photographic Plates 249

Moss, G. H.—
On the Preparation of Collodio-chloride Paper ... 503
The Preparation of Plain-salted Silver Paper ... 507

Mummery, H. H.—
Pictorial Treatment of Landscapes 709

Murchison, Hector E.—
The Future of Photography 823

PAGE

Neuhauss, R.—
Phosphorescence of Gelatine Plates 728

Noble, Wilson—
Arrangement for Drawing off small Quantities of Developers 229

Pike, J.—
Apparatus for Enlargements 742
Films, and How to Work Them 726
Our Enlarging Apparatus, and What to Do with It 246, 297
Printing-out Papers in Practice 501
Residues from P.O. Papers 487
Some Notes on the Use of Modern Solutions ... 807

Richards, E. J.—
Copyright in Photographs 89

Richardson, Arthur—
Solarisation: a Lecture Experiment 216

Rockwood, Geo. C.—
Does Marriage Cause Likeness? 827

Sachse, J. F.—
Colour (?) Photography 773
The Bichromate Infection 553

Schraberle, Prof. J. M.—
Description of a Photographic Telescope Equatorially Mounted 665

Scotton, Thomas A.—
Iron Process for Copying Drawings 822

Selby, Leslie—
"A. P." Jottings 311, 331, 346, 359
Carbon Jottings 742, 757

Shepherd, E. Sanger—
The Cause of "Devils" or Pits in Photo-engraved Copper Plates 263

Snappschotte, J. Focus—
The Heliogablotype 630

Sperry, G. B.—
Genre Work and its Future 697

Starnes, Herbert S.—
The Amount of Silver in Albumen Paper Prints ... 262

Stewart, J. J., B.A.—
The Spectroscope 538

Story, A. T.—
Who is the Inventor of the Kinetoscope? ... ...

Tache, Dr. Maximilian—
The Stability of Printing-out Papers 712

PAGE

Talbot, C. B.—
Asphaltum and Etching 11

Taylor, F. B.—
A Note on Exposure 535

Teape, J. S.—
Collodio-chloride for Transparencies 24
Delegates' Report of the Shrewsbury Convention... 548

Tennant, John A.—
Outside Specimen Display as a Business Persuader 619

Thomas, W.—
Notes on Hand-camera Work 458

Totani, Shyozabaro—
Photography in the Chino-Japanese War 598

Tulloch, J. K., M.B.—
Lantern Slides Pictorially Considered 309
Softness of Definition 280, 343

Von Norath, J.—
Suggestions for Improvement of Defective Negatives 519

Wall, E. J.—
A Note on Colour-sensitive Plates and Screens ... 375
Photography in Colours 474, 484

Watkins, Alfred—
Control in Development. A Reply to Mr. Edwards 132

Watson, J.—
Rough-surface Papers 745

Webster, G. Watmough, F.C.S.—
"Monococylmetadihydroxylbenzolzirconallylauromethylphtalein" 326
The Genesis of a Residue Jar 597

Weed, C. L.—
The Printing and Toning Rooms 714

Welford, Walter D.—
Some Idle Thoughts on Photographic Societies 679, 693
The Art Craze 199
The Hand Camera—Then and Now 54

White, Gleeson—
Some Aspects of Modern Illustration 484

Whittet, R.—
Half-tone Engravings by the Enamel Process 572, 584, 600

Wilmer, Horace—
Modern Photogravure Methods 216

Wilson, M.—
Ammonium Carbonate Developer ... 130, 282, 298
Tests for Sodium Thiosulphate ... 490, 555, 570

THE LANTERN RECORD.

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JANUARY—DECEMBER, 1895.

	PAGE
Acetylene Gas	94
Adventures with an Oil Lantern	8
American Lantern Trade, The	72
Anaglyph, The, and How it is Made. By A. F. Watch	93
Anaglyph, The. By Julius F. Sachse	7
Anaglyph. By F. E. Ives	16
Apparatus for making Lantern Slides by Artificial Light. By A. Kapteyn	28
Aptus Museum Stand and Camera	56
Artificial Light for Photographic Purposes. By John H. Janeway	39, 44, 54, 71
Astronomical Camera at the Sydney Observatory	95
Binocular Photo-micrography. By Hon. A. A. Adee, A.M.	51
Breath-Figures. By Dr. J. G. McPherson	47
Brown's Pocket Stereoscope	88
Camera, The, in the Rockies. By H. H. Buckwalter	77
Chadwick's No. 2B Patent Lantern	22
Chadwick's Stereoscopic Hand-and-Stand Camera	56
Colour Photography	63
Colour Projection	80
Curious Optical Phenomenon	77
Cylinder Explosions	53
Davenport's Combined Curtain Slide and Panoramic Carrier	38
Day's Portable Stereoscope	88
Electric Light for Lantern Work. By Cecil M. Hepworth	66, 75, 85
Electric Light for the Optical Lantern. By G. R. Baker	45
Electric Light in the Optical Lantern. By C. Higgs	13, 50, 76
Flashlight Wonders	96
Gas Cylinders. By W. I. Chadwick	37
Hand-camera Exposures	64
Have Telescopes reached their Limit?	70
Hepworth's Arc Lamp for the Optical Lantern	69
How to Use a Lantern. By Major Wilkinson	15
How to Use and Take Care of a Gas Regulator. By G. R. Baker	30
Incandescent Gaslight as an Illuminant for the Enlarging Lantern. By John A. Hodges, F.R.P.S.	83
Kinematograph, The	72
Kinetoscopes, Improvements in	93
Kodaks as Enlarging Cameras	64
Kodak, The, Inside the Great Pyramid	56
Lantern and Box, An Improved. By W. D. Askew	92
Lantern Mems. By G. R. Baker	4, 12, 20, 28, 36, 43, 50, 59, 68, 74, 82, 90
Lantern Notes and News	1, 9, 17, 25, 33, 41, 57, 89
Lantern-slide Making. By J. O. Grant	87
Lantern-slide Making. By Surgeon-Major J. L. Van Geyzel, M.B., F.I.C.	60
Lantern Slides, A New Method of Making	69
Lantern Slides. By Joseph Cottier	53
Lantern Slides by Reduction, Experimentally Demonstrated. By J. H. Baldock, F.C.S.	78
Lantern Slides by the Arc Light	23
Lantern Slides, or Transparent Pictures. By Prof. A. H. Sexton, F.I.C., F.C.S., &c.	46
Magnesium Torch, A. By G. M. Hopkins	70
Mechanical Part of Lantern-slide Making. By C. R. Pancoast	15
Microscope for the Examination of Opaque Objects	83
Modern Lantern-slide Methods. By John Carbutt	38
New Combined "Cut-off" and Fine Adjustment Valve	88
New Form of Lantern	87
Newton's New Photo-micrographic Apparatus	26
Newton's "Universal" Electric Hand-feed Arc Lamp	94
Oil Lamp, The Care of the	71
Perception of Colours, On a Physical Theory of the. By George Darzens	72
Perception of Light. By G. G. Stokes, F.R.S.	90
Philip's Incandescent Gas Burner for the Optical Lantern	27
Photographing Interiors by Flashlight. By Dr. Hugo Erichsen	78
Photographs and Lantern Slides of Life Models	59
Photography by Lightning. By W. Lindsay	67
Photo-micrography. By T. E. Freshwater, F.R.M.S.	14
"Primus" Lantern Specialities	79
Primus Novelties	8
Printing Direct and in the Camera	1
Projected Portraits, by Limelight	5
Recent Lantern Patent	48
Searchlight, The. By Radiant	3, 11, 19, 26, 35, 42, 49, 58, 66, 73, 81
Shaw's Stereoscopic Tripod Head	15
Spectrum of the Limelight	1
Spratt Brothers "S. B." Patent Camera	63
Stereoscope, A much-needed Improvement in the. By Professor Charles F. Himes, Ph.S.	59
Stereoscopic Projection, A Method of. By E. W. Scripture	94
Stereoscopic Transmitter, A	40
Vignetting by Artificial Light. By W. B. Bolton	18
"Wet" Lantern Slides for Colouring, To Prepare	80

CONTRIBUTORS.

	PAGE
Adee, Hon. A. A., A.M.—	
Binocular Photo-micrography	51
Askew, W. D.—	
Lantern and Box, An Improved	92
Baker, G. R.—	
Electric Light for the Optical Lantern	45
How to Use and take Care of a Gas Regulator	30
Lantern Mems 4, 12, 20, 28, 36, 43, 50, 59, 68, 74, 82, 90	
Baldock, J. H., F.C.S.—	
Lantern Slides by Reduction Experimentally Demonstrated	78
Bolton, W. B.—	
Vignetting by Artificial Light	18
Buckwalter, H. H.—	
The Camera in the Rockies	77
Carbutt, John—	
Modern Lantern-slide Methods	38
Chadwick, W. I.—	
Gas Cylinders	37
Cottier, Joseph—	
Lantern Slides	53
Darzen, George—	
On a Physical Theory of the Perception of Colours	72
Erichsen, Dr. Hugo—	
Photographing Interiors by Flashlight	78
Freshwater, T. E., F.R.M.S.—	
Photo-micrography	14
Geyzel, J. L. Van, M.B., F.I.C., Surg.-Major—	
Making Lantern Slides	60
Grant, J. O.—	
Making Lantern Slides	87
Hepworth, Cecil M.—	
Electric Light for Lantern Work	66, 75, 85
Higgs, C.—	
Electric Light in the Optical Lantern	13, 50, 76
Himes, Prof. Charles F., Ph.D.—	
A Much-needed Improvement in the Stereoscope	59
Hodges, J. A., F.R.P.S.—	
Incandescent Gaslight as an Illuminant for the Enlarging Lantern	83
Hopkins, G. M.—	
A Magnesium Torch	70
Ives, F. E.—	
The Anaglyph	16
Janeway, John H.	
Artificial Light for Photographic Purposes	39, 44, 54, 72
Kapteyn, A.—	
Apparatus for Making Lantern Slides by Artificial Light	28
Lindsay, W.—	
Photography by Lightning	67
McPherson, Dr. J. G.—	
Breath Figures	47
Pancoast, C. R.—	
Mechanical Part of Lantern-slide Making	15
Radiant—	
The Search Light 3, 11, 19, 26, 35, 42, 49, 58, 66, 73, 81	
Sachse, Julius F.—	
The Anaglyph	7
Scripture, E. W.—	
Stereoscopic Projection, A Method of	94
Sexton, Prof. A. H., F.I.C., I.C.S.—	
Lantern Slides or Transparent Pictures	46
Stokes, G. G., F.R.S.—	
Perception of Light	90
Watch, A. F.—	
Anaglyph, The, and How it is Made	93
Wilkinson, Major—	
How to Use a Lantern	15

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'*The British Journal Photographic Almanac.* The new edition of this excellent almanac for 1896, published by Henry Greenwood & Co., 2 York Street, Covent Garden, London, is a distinct advance on previous issues, both in the diversity and usefulness of its contents and in its size. Year by year it has grown until the present book is a thick volume of nearly 1,400 pages. From cover to cover it contains matter that is of the greatest interest to both the professional and amateur photographer. There are a host of hints which will be invaluable to artists of the camera, most of them contained in short articles by various contributors, and a very well-written and lengthy paper on the "Wet Collodion Process," which should prove of great service. The book contains a number of good photographs, and a portrait of Sir Henry Trueman Wood, M.A., the president of the Royal Photographic Society.'—*Liverpool Journal of Commerce.*

'The *British Journal of Photography Almanac* for 1896 fully maintains the reputation of former issues as one of the indispensable adjuncts to the photographer's library. The various improvements in lenses, cameras, printing-papers, &c., are carefully and concisely treated, while many valuable "technical tips" with regard to cloud effects, toning development, stereoscopic and lantern-slide work, and many other subjects are contributed by various correspondents. The *Almanac* also contains all the best developing formulæ up to date. Altogether it is a remarkable shilling's-worth. We may here note that, since the lamented death of Mr. J. Traill Taylor, that able and popular journalist and photographic expert Mr. Thomas Bedding has been appointed editor-in-chief of the *British Journal of Photography.*'—*Hare and Hounds.*

'*The British Journal Photographic Almanac and Photographer's Daily Companion*' for 1896 has reached its thirty-fifth year of publication. The book is as usual a photographic library in itself, and should prove a priceless boon to the photographer, whether professional or amateur. The information contained in its 1334 pages is most varied and of great value, and such as can be found nowhere else, and it is wonderful to think that it can be produced at the absurdly low price of a shilling.'—*Hearth and Home.*

LONDON: HENRY GREENWOOD & CO., PUBLISHERS, 2 YORK STREET, COVENT GARDEN.
And may be obtained from all Photographic Dealers and Booksellers throughout the World.

THE BRITISH
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LARGE APERTURES FOR LANDSCAPE LENSES.

A large aperture in a landscape lens confers the advantage of reducing of the time of exposure; but, in the case of a lens of even moderately long focus, such is of comparatively little use, for, if distant objects are rendered sharp, nearer ones are "nowhere" as regards definition, and *vice versâ*. We are not now specially referring to any one form of lens in particular, but to every class of lens that can be employed in the production of landscapes.

Incidentally, we may observe that absolute flatness of field cannot with the vast majority of lenses be obtained when they are used with a large aperture, such as that assumed in the preceding paragraph, although we are aware of this property existing concurrently with other good features in certain lenses of German inception.

When our English, or even foreign-made, cemented lenses of the so-called "rapid" type of long focus are stopped down to a degree sufficient to secure sharpness of objects ranging from foreground to distance, then is the requisite flattening of the field simultaneously obtained, and then is the original "Steinheil," or "rapid rectilinear," able to compete with all comers. Not that we would seek to detract from lenses having absolute flatness with the largest of apertures, Phœbus forbid! for we look upon such as optical triumphs, and appreciate them accordingly; only we do not blind ourselves to the fact that, in order to secure a lengthening outwards of definition, even the most perfect instrument, optically considered, must be employed with a more or less reduced aperture, which brings it nearly on a par with those in every-day use. We reiterate the statement that this has mainly reference to the delineation of landscapes by lenses of long focus—say, twelve inches or upwards. The optical reasons for this have elsewhere already been sufficiently discussed, hence they need not be alluded to again further than to say that they are referable to the law of conjugate focus. Hence, the longer is the focus of any lens, the more in proportion must it be stopped down in order to bring even to moderate uniform sharpness scenes situated at a distance from each other.

As the foci of lenses shorten, so is the depth of defining power increased, and with those of five or six inches focus, working, say, at from *f*-8 to *f*-11, there is but little need for the employment of a diaphragm, so far as concerns the bringing into harmonious sharpness objects beyond a few yards' distance from the camera. It is in lenses of this class that the advantage of *absolute* flatness of field will be most apparent, especially for hand cameras, in which great rapidity of action is needed. What is here desired is largeness of aperture, conjoined with the flattest obtainable field. It is only by the most recently introduced lenses that this desideratum has hitherto been obtained.

But we do not think slightingly of the good old friends which have rendered so much good service during the past two or more decades, in which the glass of more than a quarter of a century finds a place. They will continue to live on, despite the theoretical beauty of modern rivals.

Reverting to the discriminating of planes at various distances, by large lenses of long focus on the one hand and small short-focussed objectives on the other, we have had trials made of both the smallest and the longest one in our possession, the focus of which is eighty-eight inches with an aperture of nearly five inches. As it gives absolute sharpness of the axial rays, it affords facilities for a practical study of conjugate focus as applied to landscapes. Within a distance of something over a mile it has no "depth of focus" whatever. We need scarcely say that it is of very limited use in landscape photography, for which purpose, however, it was not made, for, when focussed sharply on a prominent building at the distance of a half mile, objects about a hundred yards nearer were found to be sensibly out of sharp focus when examined by a small Ramsden eyepiece. And this discrepancy was found to exist even when the objective was stopped down to one-half of its area; but, with the smaller lens of short focus, when even worked with a comparatively much larger aperture, the depth was so great that there was no appreciable difference in the sharpness of an object only seven feet away and that of the building to which we have just made allusion.

PHOTOGRAPHY FOR THE PRESS.

Every observant photographer must have noticed—indeed, had forced upon his attention—the growing use of photography in the illustrated journals of the day. Portraits, landscapes, ceremonials, scenes of accidents, every popular event, every popular or notorious personage, all are pressed into the service of journalism, all form an important and integral part of its system. It has occurred to us that, as there is here a perennial source of income to photographers generally, if not to any particular photographer, a few hints on the subject may be of service.

Naturally the first thought will be given to the manufacture of the blocks by photographic means; but we must at once say that we shall make a passing allusion only to them. The production of these "process blocks" is a very large and growing business, the various conductors of which need no business hints from us; but what we would here say is, that it is quite certain that every year the demand will grow for this work, which is by no means confined to London, as so many suppose.

For newspaper work, of course, it is almost essential that the place of production should be within easy reach, on account of the need for extreme promptitude of production; but, apart from that, our readers may be assured that in the provinces much of this work is done, and excellently well done.

Turning now to what we may now term photography proper, what are the chief requirements for this work? The reply is, When the subject is one of interest for the immediate present only, extreme promptitude; when the subject is interesting from its intrinsic beauty, or strangeness, or rarity, artistic excellence in the work.

Dealing with this part of the matter first, it may be said that there is always a market, limited, of course, for a certain number of beautiful photographs, as also for photographs of objects that would command widespread interest on account of any specially rare or curious character they may possess.

Any one possessing photographs of this kind, and offering them in a business-like way, will stand quite as good a chance as, probably much better, than one who has literary wares to dispose of, and will receive courteous treatment at editorial hands.

But the class of work most likely to command attention is a photograph of any one who for the hour is famous or talked about—from the highest to the lowest in the land, it is enough that he is talked about—or any place or event that has become equally a prominent topic. If photographs are in existence already, the photographer will not have much chance of making money, unless he happens to have registered to own the copyright. When the person, or the event, or place, has not been photographed, then arises the chance of the up-to-date photographer. Let him, by the best means he can, secure a photograph, and send copies at once to such illustrated papers as seem most suitable. Our readers may remember some correspondence that occurred a few months ago in these pages which touched upon this matter, and will give point to our advice. For a photograph to be of any use it must arrive at the office of the paper several days before the day of publication. If a paper goes to press on Wednesday for its Saturday-dated edition, it is no manner of use sending a photograph on Wednesday morning, and so on.

Therefore all that a photographer can do to ensure dispatch he should do. Our recent remarks on quick printing will have a bearing on this point. Let us suppose the happening of an event of sufficient importance to make it probable that an illustration of it would be given. The camera being taken to the spot, and due exposures made, there is little chance of success unless the negatives be developed and printed from, and the prints dispatched all in one day. There is not the slightest difficulty in this, even in dull weather, if developed prints are made. If there be time, the process-block maker greatly prefers an albumenised paper print, but can utilise one produced by development where time is an object. Those of our readers who were at the Dublin Convention will remember that Mr. Werner had a mounted platinotype print at the Lady Mayoress's garden party within two or three hours of the plates being exposed upon the "Convention Group"—very quick work, indeed, but the only kind of way, as a rule, to make use of photography for press work. Where great dispatch is needed, it is quite easy to print from the wet gelatine negative by squeegeeing the bromide paper, and then developing before the paper dries, fix and wash but slightly—for this special purpose—soak in methylated spirit, paste and mount, and any smart man would be able, if necessary, to get his print dry and mounted within an hour after he entered his dark room with an undeveloped plate.

Finally, we will just give a little worldly advice on this subject. Editors are known, of course, to be very superior persons, but they are liable to some of the usual human failings. Particularly are they jealous! If a photograph is offered to one editor one week and accepted, it is no use offering it to another if the editor would have to use on a subsequent date. Even if at the outset he had accepted it, he would, in all probability, return it when the "other man's" picture appeared.

THE METO-QUINONE DEVELOPER IN WINTER.

During the past twelve months we have alluded on more than one occasion to the excellent working qualities of the combined metol and hydroquinone developer, for which we gave a formula, on which we have since received numerous laudatory comments. In the course of the last fortnight, however, we have received two or three complaints that the mixture, which has hitherto fulfilled every requirement, shows an incapacity for the performance of its duty now that the weather has become really cold, and that it is, in fact, inferior in action to either of its constituents singly instead of combining their good points.

That, under certain circumstances, these complaints may be well founded we shall not for a moment deny, but that it is not necessarily so we at once assert, and shall try to show, lest others who have hitherto found the combination work satisfactorily may be induced to relinquish its use from similar reasons. The causes that bring about this apparent change of behaviour are perfectly natural, and are simply traceable to the fall in temperature and the neglect on the part of those who have complained to take the necessary precautions to counteract the effect.

In more than one instance the dissatisfied parties have announced their intention of "going back to pyro," another fact which goes far to justify us in the opinion we have expressed, that the cause of complaint is mainly negligence. Pyro is so freely soluble in water to almost any extent, that even the most concentrated stock solutions usually employed exhibit not the least tendency to precipitate with a sudden lowering of temperature; consequently, those who have been in the habit of using pyro only may have experienced comparatively little difficulty in the colder months, even though they may altogether neglect the advice so frequently given with regard to regulating the temperature of the dark room and developing solutions.

But, as we have long ago pointed out, first in connexion with hydroquinone and subsequently with para-amido-phenol and others of the newer introductions including metol, the solubility of these substances is far less, and consequently their stock solutions require much closer attention in cold weather; in fact, in the case of the happy-go-lucky operator, who altogether disregards temperature, or who, at the best, takes a jug of warm or tepid water into the dark room to dilute his stock

solutions with, he had better stick to pyro and especially let hydroquinone alone. The solubility of the latter is, in fact, so low, that a stock solution that is perfectly clear at a moderate temperature of, say, 60° Fahr. will deposit crystals long before anything approaching winter weather is experienced, and when these are once thrown down it is pretty certain that they will not be taken up again unless artificial heat is applied to the solution for the purpose.

Further than this, it has long been recognised that the developing action of hydroquinone becomes rapidly lower, as well as weaker, as the temperature decreases, in fact it was recommended, in the early days of its use, to warm the solution to 65° or 70° in order to secure rapidity and vigour of action. So marked is this falling off in energy that a solution of hydroquinone, which at the normal temperature of 60° develops with moderate rapidity and gives ample density, will, with a drop of only five or six degrees, become inconveniently slow in action, and refuse to give proper printing strength, however long its application may be continued.

Metol is more soluble than hydroquinone, but, as compared to pyro, it is liable to the same objections, though to a less extent, and, if kept in stock solution of anything like the degree of concentration of the formula given by us, it is very apt to partially crystallise and then lead to uncertainty and dissatisfaction.

To come to the point of our remarks, then, we can only say that there is little doubt as to the cause of the alleged falling off in the good behaviour of the meto-quinone developer complained of. If our correspondents will take the trouble to examine their bottles of stock solution, we do not hesitate to foretell that they will discover a very copious precipitate, if no artificial means of warming the dark room have been adopted; indeed, at the state of concentration of the formula we gave, it is scarcely safe to allow the temperature to fall below 60°. Even in the late summer and early autumn, before the necessity for general purposes of using artificial heat had arisen, we have found copious crystals, needle-shaped, showing they were mainly hydroquinone, formed in the compound stock solution; but at this time of year, and in the weather we have had during the last fortnight, the crystalline formation will be quite different.

A day or two ago we made a quantity of meto-quinone solution, observing the proportions given in our formula of last year, and using hot water in its preparation. When solution was complete, and while still warm, it was filtered, and set aside to cool down to the atmospheric temperature—probably about 40°—when, in a very short time, long, in fact, before it could have reached that temperature, a powdery precipitate began to form, and in a few hours there was a thick layer of the same character at the bottom of the bottle.

To demonstrate the effect of using such a solution, equal quantities of the newly made and of our ordinary stock were diluted with similar volumes of water, and brought to a temperature of 65°. An exposed plate was cut in half and the two portions developed separately in the rival solutions. The result was that, though there was no practical difference in the rapidity of action, or, at least, in the appearance of the image, while that given by the new solution was thin and weak, the other was as rich and vigorous as could be wished, although in the former case the action was much further prolonged, in order, if possible, to work up the density.

There is another point in connexion with hydroquinone which may be referred to here as bearing upon the winter behaviour of the combined developer. It is well known that, in conjunction with the caustic alkalies, it forms a far more energetic developer than when the carbonates are used; in fact, it has been stated that carbonate of soda is practically inert with hydroquinone. With this argument we do not for one moment hold, though we recognise the greater proportionate energy of the alkali when in the caustic state; but it will be found that, when carbonate of soda is used with hydroquinone, the developing action falls off with great rapidity as the temperature is lowered, with far greater proportionate speed, in fact, than when caustic soda is used, and a developer that answers satisfactorily in summer may prove utterly useless when the colder weather comes.

Here we have another reason why the combined meto-quinone developer should behave differently and less satisfactorily at this time of the year than in summer. The function of the hydroquinone in the solution is to give greater density to the developing image; but, if a portion of it be allowed to crystallise out through lowered temperature, and the remainder has its active power so seriously reduced from the same cause, there is little benefit remaining from the addition.

During the early portion of last year, and later on in the summer, we made a number of trials with metol alone, and with the mixture with hydroquinone, using caustic soda instead of the carbonate; but, owing to a strong tendency to veil except in the presence of a large dose of restraining bromide, we saw no reason to depart from the formula we then gave. Seeing, however, the possibility that, under altered circumstances of temperature, an advantage might be gained, we have made a further trial, and with decidedly beneficial results. While, even at a temperature of 65° to 70°, there is little if any tendency to fog or veil when bromide is altogether absent, and with the usual dose there is absolutely none, the full benefit as regards density is derived from the addition of the hydroquinone, and the rapidity of action of the metol at the same time retained. The following is the modified formula we would recommend:—

Metol	60 grains.
Hydroquinone	30 „
Sulphite of soda	1 ounce.
Sodium hydrate	120 grains.
Bromide of potassium	10 to 15 grains.
Water	15 ounces.

The bromide may be omitted if preferred, or kept in separate solution for use as desired. The alkali also may be kept in separate solution by those who object to single-solution developers, though this keeps admirably for several weeks or months.

Lantern Screens.—From a recent report of the annual *conversazione* of the Port Elizabeth Amateur Photographic Society, it seems that a little novelty in connexion with lantern screens was shown. Instead of the usual plain white sheet, the screen was embellished with a tastefully designed border. It is a little surprising that lantern screens are not generally provided with a border of some kind to relieve the plain monotonous appearance of the sheet when the lights are turned up. It may be argued that the introduction of a border would necessitate a larger sheet; so it might, but not to any great extent. A ten or twelve-inch ornamental margin on a ten-feet screen would be quite sufficient, and would be far more agreeable to look at than the raw edges of the fabric.

Mounting, Titling, and Plate-marking in One Operation.—Apropos of the subject of plate-marking alluded to below, we are reminded of a method of mounting we saw in practice in a Continental establishment, that did a large publishing business a year or two ago. By that method the prints were mounted on India paper, titled, and plate-marked at a single operation, while all cockling of the mounts, however thin, was avoided. The method was this: The prints were starched at the back and allowed to dry. They were then trimmed. The India paper, cut to size, was then damped and brushed at the back, as was also the mount on the front, as for copper-plate printing. A copper plate bearing the title was inked up in the usual way, and on it was laid the print, face downward, on that the damp India paper, and on that the mount. The whole was then passed through a copper-plate press, and the operation was complete. Neither the print nor the mount was damped, except by contact with the India paper, therefore there was no cockling whatever in the finished pictures.

Art Lantern Slides.—Seeing the great success that the "Living Pictures" have met with at the different places at which they have been shown, one cannot help wondering that the same and similar subjects are not published as slides for the lantern. One thing that has greatly conduced to the success of these representations is that the subjects portrayed are popular pictures, with which the public have become familiar from seeing the photographic reproductions of them in so many shop windows. If lantern slides of these works were forthcoming, there is little doubt they would command a ready sale; but, so far as we are aware, they are not to be had. Again, reproductions from the old masters as lantern slides would be of great value in art schools if they were of the same excellence as the copies which are published by some Continental houses, but we do not know of any in the market. Knowing the enterprise of these publishing houses, it seems surprising that they do not issue lantern slides as well as paper prints of their most popular works. The reason they do not may, however, be this: in Germany, where the major proportion of these fine reproductions are made, the lantern is but little used or thought of as compared with what is the case in this country. Indeed, in no other country has the lantern assumed the importance that it has in the United Kingdom. If our Continental friends realised the extensive trade there is in lantern slides in England, those of works of art would soon be forthcoming.

Frozen Water Supply.—Up to the present we have had no such severe weather as would cause material inconvenience to the photographer, but there is no saying how near it may be at hand. One of the greatest winter troubles in a photographic establishment is a frozen water supply, and what is worse is its often accompaniment, burst pipes. Yet how few take the timely precaution to guard against them. It is an easy method to prevent the pipes freezing; but, when once they are frozen, it is not an easy thing to thaw them, until there is a change in the outside temperature. It is rarely that the water freezes during the daytime, because then it is seldom at rest. It is at night that the mischief generally occurs, and it is easily avoided. If, at the close of a day's work, the supply from the cistern be cut off, and the lowermost taps opened, the pipes will be emptied, and then there is nothing to freeze. The pipes, however, will not be emptied unless air be admitted at the upper part; a tap near the cistern will answer the purpose. The best contrivance is to have a tap near the cistern, and a little below it a small air cock. Then, when the former is turned off, and the latter opened, the water can be drained out of the pipes at the lower taps. The same end may be gained, extemporally, by plugging the pipe in the cistern with a piece of tube that will reach above the surface of the water. Air will then be admitted to the pipe when the lower taps are opened. The old notion, that pipes burst with the thaw, dies hard, even with some plumbers. But it is needless to tell our readers that the burst takes place at the freezing, and only makes itself manifest with the thaw. Therefore, if perchance a pipe becomes frozen, it should at once be examined throughout its length, when the fracture, if there be one, will be easily discovered; the service of the plumber can then be invoked, thereby avoiding an annoying flooding of the premises when the "general thaw" comes, and perhaps damp walls for months. There is an old adage about "a stitch in time," &c., and this well applies in the case of the water supply in severe winter weather.

Plate-marking.—A somewhat novel method of "plate-marking" mounts was demonstrated at one of the late meetings of the Richmond Camera Club. It consists in cutting a piece out of a sheet of cardboard, the size of the plate-mark, and using it as a die, while the other portion, from which it was cut, forms a mould. Between the two the mount is placed, and the whole subjected to pressure in a copying press. The method answers well. There are, however, other simple means of plate-marking which yield good results. Here is one: Cut a piece of hard cardboard the size of the desired mark, and *slightly* round off the corners. Place this on the bed of a rolling press, and on it the print to be plate-marked; after it has been rolled, back up with a couple of thicknesses of blanketing as used by copper-plate printers, and pass through the press. The print will then have a better appearance than if the mount had been impressed first and the picture mounted on it afterwards. If a number of prints of the same size have to be dealt with, it will be well, instead of cardboard as the "plate," to use a piece of sheet zinc. If a rolling press is not at command, an ordinary letter-copying press will do as well, but, in that case, an extra thickness of blanket will be desirable. With an elastic backing, such as printers' blanketing or sheet indiarubber, no mould or matrix is necessary. In order to secure accurate registration of the marking, a sheet of paper should be cut the size of the mount, and the die fixed in position to it with a touch of gum. All that has then to be done is to lay the mounted print exactly over the sheet of paper.

ON THINGS IN GENERAL.

HEARTILY do I wish my *confrères* a Happy New Year, with health to enjoy a prosperous one. I can speak feelingly upon the question of health, for since my last lucubration I've been in a way—whether through dark-room work or not I am unable to say—of losing my eyesight, as for a week or two I was unable either to read or write. Hence I commend strongly to my readers' notice some very valuable editorial advice a few months ago about care of the eyes in the dark room. I must say I thought I had been careful, for it is my invariable practice when developing to screen the light in such a way as entirely to exclude any light from falling upon my eyes, except when holding the negative up to the light, and this I do through a kind of peep-hole to reduce the glare to a minimum. Possibly the greatest danger to the eyes—apart from the inability to properly gauge the depth of the intensification—is brought about by the constant change from the bright light of the studio to the sombre illumination of the dark room. This is a strong argument in favour of developing in batches instead of plate or plates as exposed.

I suppose I am generally taken seriously. At this time, at the beginning of a new year with all its possibilities before it, I desire to call my brother workers of the camera in the most serious way to a very growing danger to their interests. I refer to the shameless way in which so many, not all, of the illustrated papers make use for their own benefit of the work of photographers. Let any one take up a dozen of the illustrated papers of the day, and see the immense use made by them of photographs, pure and simple; I do not mean process-block work legitimately employed, but photographs of persons and places, the sole origin of their illustrations. Most of these papers actually live by photography: take the pictures so produced away, and what have we left? In some cases not ten per cent. of their interesting pictorial contents. But what is the net result to photographers? Occasionally, no doubt, something good, more often nothing. If a man buys shares in a company, and from some unexpected cause their price goes up with a rush, no one would argue that he was not entitled to all their increased value; but, if the

possessor of a photograph that has suddenly become in demand—I care not whether he was paid or not paid for taking it—he is laughed at if he asks to be paid by the proprietors of the papers for their using it, if he does not happen to have registered it—and in the proper way. At present the only remedy is to make all photographs copyright that are remotely likely to become valuable, and to see that the copyright is duly vested in the producer. A popular artist sells a painting; but that sale does not entitle the owner to the copyright, for the artist makes a bargain that the copyright is his own.

There are cases where such copyright in artistic work has been of more value than the cost of the picture itself. Therefore, by every moral law, a photographer is entitled to the same privileges; but, as he only gets his five, ten, or twenty shillings for a picture, such as the leading illustrated papers are glad to use to ornament their pages with, he does not, as a rule, trouble about the copyright, and therefore he may be robbed of his brains with impunity. It is too often the photographer's own fault; he is so pleased to see his name in a big paper that, unless he is an old hand, he would be almost foolish enough to pay instead of being paid for such an insertion. In the strongest way possible I would urge them to cast aside such an erroneous idea. One of the foremost photographers in the metropolis once said to me, and I agree with him entirely, "I never experienced one shilling of benefit from seeing my name in the papers as the author of the photograph used." This is very like a sermon, but it is a point of vital interest, and should be well brought forward. Let every photographer put his shoulder to the wheel to elevate the importance of his art or science—it matters not which it be called—and teach the papers that he wants paying for his contributions to the value of the paper, just as much as is the scribe, whose work is duly acknowledged by *l. s. d.* Finally, let me advise every one to join the Photographers' Copyright Union, and so protect himself and aid in forming public opinion in our favour, so that, when next the Copyright Bill is passed, we may not get pushed to the wall. To show how such an opinion is needed, I could cite the case of a professional photographer who, finding his copyright infringed, and writing to the paper for explanation, was told the editor had paid a blockseller for the pirated block, and, of course, it did not matter to him who he paid it to. No doubt he thought he was in the right. That is the sort of opinion we want to alter!

We are so used to seeing valuable papers over the signature of Mr. Haddon that we begin to look for them as a matter of course. Not the least valuable of the papers he has been engaged on alone, or with Mr. Grundy's aid, is that on the fading of albumen prints, read at the London and Provincial Photographic Association. He has hit a great many blots with his accustomed accuracy; but, to my mind, he has not attached sufficient value to the action of the atmosphere as a factor; I consider it a prime factor. At this moment I can point to photographs numbered by thousands, that are ten or twenty years old, as good as when first toned and fixed, except where the air has acted upon them; then they have faded into nothingness. Here was, however, distinct proof, and that is what is wanted, of the vast effect produced on a good print when air has access to it. Mr. Levy's letter (page 814) might, for its first paragraph, have this last sentence of mine as a partial reply; for, indeed, it is true that the reasons for fading are not known—only some reasons are. I would add one other reason—the quality of mounts. I have a large number of prints in a particular set of mounts that have all faded, though kept in a packet free from access of air, while other similar prints done the same time are perfect. This is not proof, but it is a close approach thereto.

FREE LANCE.

PREPARATION OF PLATINO-CHLORIDES.

THE improved methods of preparing potassium chloroplatinites just introduced by Mr. Carey Lea must tend to further advance the employment of platinum for toning and other photographic purposes. For the benefit of those who are not able to obtain the salts used by Mr. Lea, I may say that potassium acid sulphite is prepared by passing sulphurous acid gas to saturation into a solution of the normal salt, potassium sulphite. On subsequently adding alcohol, the acid salt separates in white needles, and may be drained on a funnel and dried.

Potassium hypophosphite may be obtained from large dealers in chemicals at a cost of about 5*s.* per pound. Hence it is not economical to make it oneself. Should its preparation, however, be a matter of necessity, it may be stated that it is produced by dissolving yellow phosphorus in solution of caustic potash until no more gas is evolved, evaporating to dryness on a water bath, extracting the residue with alcohol, and crystallising.

G. E. BROWN, A.I.C.

PHOTO-MECHANICAL NOTES.

SOME attention has been directed of late to what is known as the swelled gelatine process, and the lay reader of process matters, no doubt, finds it difficult to determine, amidst the conflicting opinions of those who have written on the subject, whether this is a practicable process or not. While on the one hand an experienced zinco etcher, as is Mr. Calmels, tells us that the process "is absolutely uncertain in its results," that "it never answered from a practical point of view," and "is infinitely slower than the more modern processes," we have Mr. Donald Macbeth writing in its defence on behalf of a firm which in the course of many years' experience has proved the contrary in at least the first two respects. To my mind the real point at issue rests in the third clause of Mr. Calmels' condemnation of the process. Herein, in fact, is one of the chief reasons for the lack of enthusiasm in this country in the process. In these days of hurry-scurry the patron of the process worker will not give him a chance to do the best work when it requires the maximum length of time, and a process which takes time, comparatively speaking, is *per se* a process that comes expensive to the clients of the process worker, so that we come down to the gist of the matter, which lies in what Mr. Macbeth terms "the bad old principle of buying in the cheapest market, regardless of any consideration, except immediate profit."

There is another consideration which has, no doubt, militated against the swelled gelatine process, and that is, it is immensely more difficult to work than any of the zinc or copper etching processes of to-day. It requires skill and experience, such as cannot easily be obtained without long apprenticeship and arduous application. It also requires an expensive plant and well-appointed work rooms. A further consideration is the fact, that when the relief plate has been obtained it is necessary, except for comparatively short editions, to either take an electrotype or stereotype from it. In either case this makes the process additionally slow and more expensive.

I will grant that for certain classes of work such as the reproduction of old prints, of pencil or crayon drawing, and similar subjects where it is almost impossible to obtain a sufficiently dense negative for the etching processes, the results are unrivalled. For instance, early editions of Shakespeare's works and other rare books have been produced by this or similar processes, when it would have been absolutely impossible to have done them satisfactorily by etching. By the "wash-out" gelatine process, which is of a kindred nature to the swelled gelatine, the cheap American editions of the *Encyclopædia Britannica*, and the reprint of *Webster's Unabridged Dictionary*, were entirely produced at a cost which was much less than that of type composition, and of course saving also the expense of re-engraving the illustrations in the text.

The swelled gelatine process is practically the result of the invention of Paul Pretsch, and the "wash-out" gelatine, which is the preferable process, is the result of improvements made in methods of working in course of practice. Both these processes have been worked in the United States to the highest point of success it was, perhaps, possible to attain, yet it is significant that, so far as I can learn—without speaking from any personal experience—both are being largely if not almost entirely superseded by the etching processes, such as the dragon's-blood powdering process for line work, and the enamel processes on copper for half-tone.

These gelatine processes seem wonderfully simple when one reads the description in a book, but the uncertain factor which is too often overlooked by those who are unaccustomed to handling gelatine is that atmospheric conditions and temperature affect the work at almost every stage of the operation, and that is where the uncertainty comes in. But I do not wish to deter any one from reading up the process and even experimenting with it to determine its merits. In all old or superseded processes there is always a germ of something useful, which can often be applied to the every-day practice of other processes. For instance one who is familiar with wash-out or swelled gelatine processes will find his way more easily paved for some of the modern processes, of which the fish-glue method is representative and typical; for, after all, the fish-glue process in some of the earlier stages of its operations is nothing more than a modification of the wash-out gelatine process, and I can well believe that the inventor

of the fish-glue process, whoever he may be—and this is a matter of doubt—was a man well up in the wash-out process.

For working the swelled gelatine process in its simplest form a half-pound packet of Nelson's No. 1 gelatine is soaked in cold water sufficient to cover it, and allowed to stand for about one honr. The mass is then heated in a porcelain-lined glue pot, and heated up to 120 degrees Fahr. which temperature it must not exceed. When entirely dissolved, add to it one ounce of a saturated solution of bichromate of ammonia, stirring thoroughly, and again raising the temperature to 120°, at which heat it must be kept for five minutes. The solution is then filtered through muslin into a beaker warmed to the same degree, and thence poured on to slabs of quarter-inch plate glass, also warmed to the temperature of the solution and levelled. The quantity of solution poured on must be sufficient to cover the plate well without running over the edges. When set, which can be distinguished by touching a corner of the surface with a damp finger, the gelatine should feel pliable, but not sticky. The slabs are then removed to a light-tight drying cupboard through which a current of air, tempered to 95° Fahr., is made to circulate until the gelatine is perfectly dry. The sensitive plate is placed in contact with the negative in a wedge frame and exposed to good sunlight for about fifteen minutes or to diffused light for about one hour. The plate, on removal from the frame, is placed in a shallow tray containing clean cold water, when the swelling begins immediately. If allowed to proceed too far, the surface of the lines will be convex, whilst, if not swelled sufficiently the relief will be shallow and the surface of the lines concave. When sufficiently in relief, some workers, after washing the plate under the tap, immediately place it in a saturated solution of ferrous sulphate, in which it is allowed to remain for three minutes, and then washed thoroughly. Others dispense with this operation, and immediately dab the plate with a soft rag until surface dry. It is then placed on a level slab, and iron bars framed around it half an inch thick. A paste of finest plaster of Paris of the consistency of treacle is poured over the plate, until level with the bordering irons. A little salt dissolved in the water in which the plaster is mixed makes it set quickly and lessens its liability to crack when casting. The back of the plaster should be levelled with a straight edge, the mass being previously worked well in to the relief by the same means. When fully set and hard, the bordering irons are pulled away and a knife inserted between the glass and plaster in order to separate them. Before being handed to the stereotyper, the cast should be flowed several times with a solution of half an ounce of silicate of soda in twenty ounces of water, and washed well under the tap. The mould is again laid on the casting slab and type-high bordering irons placed around it. Plaster of Paris is again poured in and levelled up to the bars. When hardened, the two casts are separated easily with a knife, and the second cast is the one that is handed to the stereotyper, who will readily know how to print it in order to secure a metal block. If an electrotype is desired, the silicate solution is omitted, and, instead of taking a second cast in plaster, the original mould is immersed in water until the plaster will absorb no more, which may be seen by the surface being evenly moist. Electrotypers' moulding wax is then poured in, and when set is lifted away from the plaster cast, blackleaded, and put into the depositing tank. It has been found practicable to dispense entirely with plaster moulds for electrotyping by steaming the gelatine surface, if dried, and brushing over with black lead, or by brushing over a solution of nitrate of silver, and reducing it to the metallic state by some such agent as sulphuretted hydrogen or pyrogallic acid, but there is a great risk in this method of direct depositing of the gelatine relief being attacked.

The wash-out gelatine process differs from the swelled gelatine in several respects. The gelatine has to be rotted by being placed in basins covered with water in an oven, in which the heat is regulated to the uniform degree of 120° Fahr. for twenty-four to thirty-six hours. Nelson's amber gelatine is used, and is covered with distilled water. The mass is occasionally turned, and the experienced operator knows when it is sufficiently done by its odour. A sensitising solution of potassium bichromate, dissolved in warm water, and with liquor ammonia added until turned to a light yellow colour, is mixed in with the gelatine, stirring constantly. A certain amount of glycerine — the quantity depending on temperature and humidity — is also added, to give flexibility to the sheet. The solution is then strained through canvas into a pouring dish, which has a fine wire gauze strainer over the lip. Setting frames are made of plate glass, framed in with a raised flange of wood or tin. The glass is thoroughly rubbed with a solution of wax in benzole, and the gelatine poured in and allowed to set, after which they are placed in a drying oven, and will be desiccated in about forty-eight hours. The dried sheets are rubbed with French chalk, and placed in contact with the negative in a frame which is shielded from side light by means of a box three or four feet long, with both ends open, which is placed in front of the frame, thus ensuring the light striking perpendicularly. The exposure may vary from two to twenty minutes. The washing out of the gelatine is done by first bringing the sheet into contact under water with a plate of glass, the water being pressed from between them, and the exposed side being next the glass. The back of the gelatine is flowed with alcohol to remove the moisture and grease. Basins of hot and cold water are placed alongside, and with a brush, such as jewellers use for cleaning plate, the gelatine is brushed freely in a circular motion with hot water until sufficient relief is shown. The gelatine film is then removed from the glass dipped into cold water and quickly drained, thence being immersed immediately in a tray of methylated spirit. Sometimes a second washing out is given by filling in the relief with an opaque paste, consisting chiefly of fish glue, treacle, and lamp-black, which is applied with a spatula to the relief, and when set is wiped off the surface of the lines with a damp cloth pad. The film is then placed on a black board, and exposed to light for a longer time than the first exposure. The black paste is then brushed out, and the washing out of the relief continued with a thicker brush. It is then dried off in alcohol, and mounted with shellac to a zinc plate, when it can be printed from, though it is generally desirable to make an electrotype in the usual way.

It will be seen from this brief description that the wash-out gelatine process is much the more difficult of the two, and, if we take the time occupied in preparing and drying the films, it is a very slow process. Even when the films are already prepared, it is hardly possible to make a relief plate in less than eight hours, so that it can be readily seen that such a process can never seriously compete with the zinc or copper etching processes, in which it is quite possible to produce a block throughout, including the taking of the negative and the mounting of the finished plate, in from one and a half to three hours.

WILLIAM GAMBLE.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

I.

IN the term "photography" itself, meaning as it does "the art of writing by light," a photographer has placed before him, without any ambiguity, the key-note to first of all essentials to a successful practice, viz., light. And, just as in the case of a painter, who, without his colours is powerless to produce any painting on a canvas, so with the photographer, possessed of the most expensive outfit in the shape of camera, lens, &c., all necessary enough in their own sphere, no doubt, but without light, he simply stands powerless also to bring into existence those marvellous changes on a sensitive plate which he eventually develops from the latent invisible to the visible positive or negative image.

Light is undoubtedly the all-important factor; and any student anxious to succeed in photography cannot ignore its importance, for, whichever branch of the art he is pursuing, the question of employing not only the quality best suited to the particular class of work he is undertaking, but also the proper quantity of light to use, will, at all times, form important considerations.

Broadly speaking, the practice of photography may be divided into two classes, viz., indoor and outdoor exposures. I propose to offer a few remarks, in the first place, on a few essentials to the successful practice of outdoor working.

In outdoor work there are five distinct kinds or qualities of light which as a rule, luckily or unluckily, a photographer will find at his disposal. These are:—

1. Bright sunshine.
2. Sun visible through haze or thin clouds.
3. Sky overcast, with sun hidden in places, but with part of the sky clear.
4. Sky overcast, with sun hidden entirely.
5. Sky overcast with heavy clouds.

In the application of each of the above conditions of light to an outside subject, say, a landscape, were any one to expose a sensitive plate on same, under each of the above kinds of light, all of which exposures were correct as to time, with the greatest care in development, he would, as a result, obtain negatives in the following order of merit:—

No. 1, excellent; No. 2, good; No. 3, medium; No. 4, poor; No. 5, bad.

From this we gather how essential bright sunshine is in nearly every class of landscape work.

To demonstrate this, let any one proceed to select a suitable outside subject, such as an old castle surrounded with trees and other foliage; let him do this on a day when the light is coming and going between brilliant sunshine, and at other moments it is just glimmering through thin, fleecy, misty clouds. A suitable position for the camera having been selected, let a plate be exposed, when the view is lighted by the sun slightly shining through thin, misty clouds. A practised worker in landscape will at once detect the absence of those charming high lights, middle tints, and rich shadows, although the building and view may seem to any one not possessed of much experience to be extremely well lighted. Let him, however, expose a plate under these conditions, and then wait patiently, without in any way altering the position of the camera; or, in other words, simply proceed to take a duplicate, only this time let him wait until the sun is quite clear of any misty or fleecy clouds. When such occurs, what a change the building and surroundings will show in their appearance from a photographic point of view! Not only will the deepest shadows appear more intense, but there will be a distinct improvement in the range of half-tones in those places where the shadows are thrown from the brightness of the sunlight which now exists; and most marked of all the improvements will be the presence of charming high lights, which were entirely absent when the sun was slightly obscured. A plate exposed under these conditions of lighting, carefully developed, alongside each other, and in the same manner will yield a result strikingly different from the plate exposed with the sun slightly obscured. Prints from the latter negative will appear flat and poor when compared with the brilliancy of those pulled off from the negative produced by strong sunlight, for in the one case there will be an almost total lack of vigour, while in the other this will be most noticeable from the range of tones running between strong high lights and deep shadows.

This is a very instructive experiment for any beginner in photography to undertake, and one that will perhaps open his eyes more than anything else to the great importance that must be attached to the question of lighting, for the careful study of such is most essential to success in every branch of the art.

From what I have stated it may be gathered that, as a rule, no plate ought to be exposed on a landscape subject other than in bright sunshine, the brighter the sun the more brilliant the result; if there is no sun, there will be no shadow, and hence an entire absence of brilliancy, so essential to success in landscape work.

A beginner, having firmly established in his mind the necessity of exposing his plates on such subjects when sunlight only lights up the view, must go a step further; and this means a careful study of the particular hour of the day when any view is best lighted, for there is in every case an exact moment when a view just looks its best, and the great aim in landscape work is to so study beforehand the ever-varying appearance a view will present as the sun and shadows pass over and around it. This is also most essential to success, and should never, if possible, be neglected. It is wonderful what difference in appearance many views will present under the ever-varying conditions of light and position of the sun. Often a poor foreground is much improved by having some deep shadows thrown upon it, whereby it is charmingly broken up into middle tints and shadows, but it is only by constant and close watching that real advantage can be taken of such a mode of working.

Here is another experiment for a beginner, and it will also prove highly instructive in this particular class of landscape work.

Perhaps one of the most difficult examples of outdoor subjects to photograph successfully is that in which the smallest possible amount of contrast is present. Such an example will often be found in an open field or view having no decided objects in the foreground. Cases of this kind require, as I have said, especial study, so that a worker may judge of the exact time of day when any little stone, tuft of grass, or other rough portion, throw their little shadows.

Let a beginner select such a subject, and proceed to expose a plate upon such, with the sun at almost danger point. By this I mean that, having fixed up the camera at that time of day when the sun has just passed off and round from shining into the lens, and then, by waiting until the sun comes round behind the camera, let him, without in any way moving the position of the camera, expose a plate with the sun in this position also, and proceed to develop both plates in the same manner. The result will be most instructive, and perhaps somewhat surprising. A good example of such a subject to experiment upon will be found in the bed of a river, with its stony banks. In the first instance, every stone will be found to stand out in fine relief by reason of the shadows which are thrown backwards and slightly to their sides; whilst in the latter instance, viz., where the sun was from behind the camera, there will be an almost total absence of shadow, and nothing but a poor, flat, weak negative result, from which it is almost impossible to throw a passable print.

In marine work also the advantages of front lighting are most marked, and some of the most beautiful results ever achieved in photography have been secured by it. While many a good seascape is ruined by exposing when the sun or source of light is from behind the camera, the latter always tends to produce a flat, mirror-like appearance, quite void of contrast and feeling of movement on the water. With direct lighting, however, the utmost amount of life and vigour is obtained, and this applies also to those charming cloud effects so much sought after by the photographer having also a keen perception of the artistic side of photography.

From what I have said it must not, however, be inferred that there are no instances in which rear lighting may be resorted to, for, doubtless, in many circumstances, it will be found that such a direction of light is preferable. I was forcibly struck with this when recently photographing the Falls of Clyde. One of the most lovely views of Cora Linn is that where the Clyde is seen careering madly along its stony bed, tumbling over its miniature falls just previous to making its final leap of eighty feet into the salmon pool beneath. The spot (in fact, the only one) where this is seen is from the river's right bank, at a point where it is virtually visible through a lovely avenue of trees. In this case we have the seething cataract with its mass of white foam standing out in strong contrast to the dark surroundings of the trees and their foliage. To employ a front light only adds intensity to the dark shadows, which are already intense enough. A side light does not mend matters, because it throws one side of the chasm into almost total darkness; therefore, in such an example, the most suitable source of light is from the rear, and this I have proved by experience, for it is only in the early hours of the morning that sufficient light can be had on the rear of the trees to produce an harmonious result in a case of this kind, so fruitful in violent contrasts. Such a subject, however, requires the utmost care in development, seeing that an exposure of one minute on such was necessary to bring out detail in the dark foliage, which, of course, was too much for the white foam in the background; but to this I hope to refer later on when I speak of a few essentials necessary to success in development. As a rule, however, it may be taken that a rear light is only applicable when very dark or distinct foregrounds are being dealt with.

A side source of lighting or, as some term it, a three o'clock light, is perhaps the most generally useful of all, yielding as it does such fine cross shadows, and when these are lengthened out, as they can be by exposing late on fine summer evenings, then the most beautiful and effective results in certain kinds of landscapes are obtained.

The selection of the best, in fact only time of day on which to make exposures, very often means the expenditure of much toil, perseverance, and early rising, for some of the finest atmospheric effects in landscape work are only secured by the early riser.

I have often been on foot at daybreak to secure some of those delightful cloud effects now and again seen on the mountain tops, and can look back with pleasure to visits paid to the Trossachs, where, up to my middle in heather and brackens, I have waited patiently for the sun's first beams to illumine Ben Venue, and when that grand mountain had not yet taken off his night-cap of thin, fleecy clouds, which are so soon dispelled by the sun's first beams, such are only got by patiently waiting, for they disappear in almost a moment whilst being gazed upon.

4.30 a.m. is a fruitful hour in summer, for very many of the most charming results in mountain scenery effects in atmosphere, and light, and shade are then obtained, which have entirely disappeared later on when the sun is high in the heavens.

T. N. Armstrong.

APPARATUS FOR ENLARGEMENTS.

During the past few years my own enlarging operations have been carried on under a variety of conditions, and in a strange assortment of dark rooms. No matter, however, where these were situated—and they roamed from basement to attic—in all, by more or less dexterous arrangement of the amount of daylight available, enlargements, positive and negative, were to be made without much difficulty.

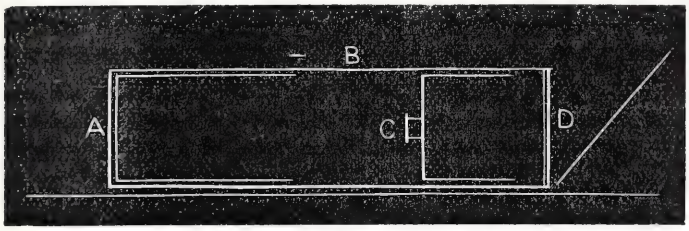
It seems hardly to be realised, but the fact remains, that many of our brother-workers actually have no convenience whatever for this kind of work, as carried on in the manner familiar to all professionals and many amateurs—viz., by making the dark room itself the camera wherein to expose the sensitive material. They have a dark or developing room maybe, but cut off from all source of daylight.

It is for such workers that apparatus complete in itself is devised and sold, whereby they are enabled in theory to do work of this kind under what ought to be fairly easy conditions. It is rather to be deplored that apparatus of this simple (?) character falls naturally into the hands of those least able to make use of it, for the truth of the matter is, this simple apparatus often requires a skilled and expert operator to get any effective results. Therefore a few observations on the selection of apparatus designed for enlarging purposes may not be considered out of place.

There is a "fixed focus" variety, which will suit many people of small means and limited ambition: this is a rigid body box camera; the negative is placed in an aperture at one end, and the sensitive paper, enclosed in a kind of bastard combination of dark slide and printing frame, at the other; the lens is fixed in a position midway between these two points but nearer to the negative than to the paper, the whole arrangement being such that no *focussing* is required. This is very simple, but not satisfactory to one who takes negatives of various sizes, and who desires a free hand in the selection of his subjects and the degree of enlargement.

Now, there is no manner of doubt, that a *sliding* or focussing camera is a much more satisfactory and business-like apparatus, for we can not only vary the size and degree of our pictures, but there is a saving in regard to *portability;* but, of course, this latter point is not of much importance where one has plenty of elbow room.

Below is figured the general design of an enlarging camera:—



A, The dark slide, fitted to a sliding body.
B, The outer case, at one end of which is the frame or aperture for
D, The negative.
C, Being the lens frame, movable backwards and forwards within reasonable limits.

In all the better-class outfits we have the body of folding leather or cloth, the ends, A and D, being two frames to serve their special purposes, a third frame intervening at C to support the lens. Of these frames it is quite necessary that two, viz., A and D, should move, as thereby we provide for the size and degree of enlargement.

Some very fine and useful outfits are made with body of sliding polished wood, and there is no reason why such apparatus should not be made to serve an ornamental as well as a useful purpose. I remember some years ago, in the house of a friend, observing an "old time" enlargement camera, beautifully made in mahogany, polished and panelled. It was a gigantic affair; compressed and stood on end, it resembled a plain but very solid and substantial cabinet; with a bust of Daguerre on the top, what more fitting embellishment to the library of the enthusiastic amateur?

It is, however, practically immaterial what the outside body of the camera is made of, but it must be opaque, to keep out light, and heavy and strong enough to stand wear and tear, and give the necessary solidity, without which there will be no facility and ease of movement and adjustment.

I have on another occasion given an opinion of the working capacity of certain cheap field cameras. Only recently I assisted at the christening of a newly bought enlarging camera; it was a sliding-body structure, rather light and flimsy-looking. Firstly, we had to withdraw the end A in order to remove C, which required to be pierced for the lens. At this point I scented danger and trouble, for the only effectual method by which A was to be removed was for one of us, myself in fact, to bodily embrace B, much in the same way that you would your first sweetheart, only with less of fervour and affection, while the other able-bodied individual forcibly hauled upon A. As this part came out an inch or two at a time and then suddenly "all of a run," our condition may be imagined. To re-insert C at a position from D, estimated by calculating its focus and the degree of enlargement wished for, was the next business; but, in order to *focus*, the struggle already briefly described had once more to be gone through.

Imagine a sitting-room with a north light, a table drawn up to an open window; upon the table, with one end resting upon the window-sill, a long coffin-like structure, with red and black drapery; upon this, again, a man astride, as if endeavouring to suppress some hidden vitality struggling to escape; at the posterior end another man in shirt sleeves, grimly wrestling with a something under the "pall!" What does it mean? Is it a foul desecration of the dead? No, my friend; it is only a couple of amateurs trying to focus an enlargement.

Imagine the hatred and loathing with which one comes to view this erstwhile object of our affections. There it lies, in all its virgin beauty, but "fair, frail, and false," like—— Well, there are so many fair photographers, I had better not finish my simile. To think that so much coaxing and embracing is necessary to move it even one inch from its course!

Admitting some slight exaggeration of detail, the fact remains that, if we have to use brute strength in order to do the bare mechanical part of our work, we have little energy left for the operation requiring the exercise of our mind and thought.

Reverting to our sketch once more, the position at D is very important. Here, by a judicious arrangement, such as may be seen on any high-class square-front field camera, we should have a double movement, lateral and vertical, so that the negative can be shifted in order to bring certain parts of it to the centre, we can get only a small range, but that little will be found extremely useful. We shall find it much more convenient when a certain bit of detail is to be enlarged, and we can, with greater ease, bring this bit to a better balance and position on the focussing screen. No such adjustment is possible at A, therefore we must make our arrangements at D as perfect as possible. Having selected a negative, block out with a black paper mask all of it *not required* for enlargement, and then endeavour to bring the remainder into correct position and focus on the screen.

The position, A, should be fitted, not only with a dark slide available for plates or sensitive paper, but a proper focussing screen, a separate frame unhinged and detachable, the dark slide well fitting, easy to work, and light-proof. If for use with bromide paper, one of Eastman's carriers should certainly be used; any arrangement whereby the paper has to be exposed beneath a plate of *glass* is likely to be unsatisfactory and tiresome. Above all, be careful to see that the focus screen and dark slide are in register.

The actual exposing method is to many a puzzle. Some complete outfits have a flap or other shutter fitted on the lens frame and worked from *out*side. Mechanical arrangements, as a rule, are often troublesome and faulty. The act of turning *up* the flap may, in careless hands, mean a little vibration, as also the turning down of the same, the former operations being the more important. A single flap Guerry's shutter, actuated by pneumatic ball and tube, is about the best to use; but, after all, as safe as any other, is a velvet focusssing cloth which may be allowed to hang loosely over the end D, this is readily removed for the purpose of making an exposure and as readily replaced.

A reflector is not generally supplied with enlarging apparatus, but is, as a matter of fact, indispensable, a large sheet of white cardboard placed opposite the negative at an angle of 45° answers every purpose.

A very sensible and convenient camera is one with a plain skeleton baseboard, upon which move three frames, represented in our sketch at A, C, and D, the body of camera being the universal bellows. The movements are very easy and perfect, and all the frames can be shifted from end to end of the baseboard. The ends, A and D, of this camera are similarly grooved; therefore the dark slide will fit in at either end, and thus, by simply reversing the positions, enlargements or reductions, as for lantern slides, by copying, can be made; also, if a print or photograph is to be copied (and it may be remarked here that some very effective enlargements are made by copying), all we have to do is to leave the end A open, shifting the focus screen and dark slide to D, then bring the lens screen forward to the distance required. As turned out by the makers, this camera has but one fault, and that is, each negative is, *nolens volens*, axially centered. You can enlarge as much of the negative as you wish, but it is always a square from the middle of the plate. In my own apparatus I have got over this by making a new front, on the principle of a double rising and sliding front (ordinary camera), and thus am able to get a small but sufficient amount of play, facilitating the adjustment of the picture.

In conclusion, the beginner who essays enlargements—and this is written for beginners—may settle it in his own mind that he will do no good whatever with ill-designed and ill-fitting apparatus.

Outside appearances need not be studied much, except that it is just as easy to make a neat bit of apparatus as a rough, but the internal fitting must be perfect, the body light-proof, and the working parts in the best and easiest order for operating.

J. PIKE.

VARIOUS METHODS OF IMPROVING NEGATIVES AND PRINTS.

THE treatment of negatives and prints in order to effect some improvement, real or fancied, on the purely photographic image has been a source of contention and quibbling ever since photography became a popular occupation or amusement. That negatives especially lend themselves to the skilful manipulations of the improver, few will dispute, and that they may be considerably advantaged by the treatment is also patent, as well as spoiled, witness the elaborately retouched monstrosities that pass for portraits at the present day, more's the pity of it. However, the abuse of retouching is not by any means condemnatory of the process itself, which in the hands of an artist is really valuable, I might add an indispensable aid to truthfulness.

In the following article I purpose to treat of hand work in its various forms, hand work from my point of view being *any* addition, alteration, or modification of the image produced solely by the action of light through the lens on the sensitive surface, or on the positive made from it. The wide divergence of opinions as to the legitimacy of doing *anything* to a negative in certain directions other than stopping out actual blemishes should, I think, with our better knowledge of the process and advanced art training, be non-existent.

Perfection having been attained long since in the production of the chemical image *i.e.*, in the use of our tools—we can hardly expect any further improvement in this direction. What is left us is the modification of this image by hand work so that its shortcomings are lessened, and its artistic and picturesque qualities augmented. There are, of course, certain cases which forbid *any* alteration, even the slightest, of the light-formed image produced by the lens. Legal and other documents are in this category; in such instances, hand work is entirely out of the question, and to such these remarks will not apply. Hand work may be classed under the following heads, all being intended to improve the purely photographic image, namely, local reduction and intensification, pencil and brush work, papering, scraping and cutting out, clouding, masking and tinting, combining several images in one print, stopping out with opaque colour, and the application of varnishes coloured and uncoloured. In this comprehensive list much is approved and adopted by all photographers, but is not usually *termed* hand work, although it undoubtedly is. Brush and pencil alterations are selected for this distinction almost exclusively; why, it is difficult to say, unless it is a survival of a tradition of early days before the capabilities of the process were so well understood, when by a few well-placed touches the artist photographer could so improve his picture that his less artistic brother was placed at a disadvantage in competitive exhibitions, or, it might be, too much was expected of photography, *per se*, in an artistic sense, at any rate there is now a widely disseminated feeling that the *improvement* of the photograph by any means is legitimate. This does not mean that any less skill is required in the first stages of the pictorial inception, for the best work always will be the best, but that it may be afterwards modified in various manners to enhance its pictorial qualities.

There are very few negatives and prints that cannot be improved by hand work of some sort, as indicated by the foregoing catalogue; at the same time, whatever it is, it should not be aggressive or pronounced in character. *Ars celare artem.* With regard to its application, more especially to negatives, it is advisable to make a rough print in strong diffused light, good as it can be made, without partial shading or any other special precautions, before anything is done, with the idea of modifying or improving it; we shall then see exactly the line of treatment necessary to be adopted. The first alterations come under the head of chemical, being local intensification and reduction, mechanical, or rubbing down, or scraping out. The method generally adopted for local chemical reduction is the application of a solution of perchloride of iron mixed with a little gum mucilage to prevent spreading, and applied with a brush, afterwards dissolving the chloride formed with hyposulphite of soda solution, or, dissolving the image with ferricyanide of potassium and hyposulphite of soda mixed in solution, also with the addition of gum, care being exercised not to carry the reduction too far. Chemical intensification cannot be so well performed on *sharply defined spaces*, although there is little difficulty when larger areas are to be dealt with, such as the ends or foreground of a negative.

Mechanical reduction by friction with a pad moistened with spirits of wine is a most useful device, and available during the unvarnished state of the negative. This should be done using as little force as possible, and with *strong* spirit; a weak spirit softens the gelatine and gives rise to trouble. The negative also must be thoroughly dry to begin with. Scraping may also be resorted to in certain cases, when the appearance of a coarse texture is desirable, as, for instance, a rough log of wood or post and rails, that reflect too much light, may by this means be brought into better harmony. Specks of light occurring in masses of shadow can be picked out with a knife point. In seascape the separation of the sea and sky is effected by ruling a pencil line, faint or strong according to the density of the negative, and softening off the line into the sky with a little black lead rubbed on. Thin places may be improved by rubbing them over with black lead on the tip of the finger. In fact, any improvement to be made with the lead pencil is more easily done before varnishing than after. With regard to varnishing, I think all negatives that are worth keeping are worth varnishing, although there are many who have an insuperable objection to protect their negatives by this means. On gelatine films varnish makes *no* perceptible alteration in the printing detail, as it used to do occasionally on wet collodion, especially after intensification. It was, of course, *absolutely necessary* to varnish the collodion film before it could be printed from, even with the knowledge that the negative might be somewhat impaired by the process. Varnishing also, under certain circumstances, improved the wet-plate negative, giving more transparency to lights that would otherwise be too dense. Gelatine is not, however, affected in any way, other than being rendered less liable to injury; if any store is set by the negative, it is as well to do it. It is particularly needful if the negative is sent to the professional printer. Many copies being wanted, it stands to reason, where many negatives have to be printed and attended to, the same care cannot be bestowed upon them as when only a copy or two is worked off at home, nor would it be reasonable to expect it. This applies particularly when albumenised paper prints are required and the printing is conducted in the open air in damp weather. In a very short time the unvarnished negative will become spotty, and eventually quite spoiled, in spite of any care that may be exercised in printing. In case of *many* copies being wanted it is advisable to give the negative a coat of plain collodion before the varnish, which will make the film quite safe with ordinary careful treatment.

The negative having been varnished, we may proceed to further modifications and improvements. In the first place, stop out pinholes, those small defects familiar to photographers. More skill is requisite to do this well than appears at first sight. In a general way, early attempts are anything but successful, the familiar appearance on the print of a large white spot with a black centre being a frequent result. It requires a certain knack to place a small modicum of colour in the centre of each pinhole without smearing it on the surrounding film. The inexperienced generally use too much colour, and that too thin. A very little, dry as it can be worked, should be taken up on the point of a fine sable brush, and the centre of the spot delicately touched. Pinholes appear much larger than they really are, by reason of irradiation. The stronger the light by which they are examined the larger they appear. Begin by stopping out the larger ones; the smaller then become conspicuous, and may be attended to in due course. The *very* small ones will not show on the print, and are better left untouched, as are any that occur in the darker or shadowed parts of the picture. Larger holes or accidental tears must be matched up to the surrounding parts, following the design of the picture in form and texture. A large gap is all the better for a piece of *papier minéral* gummed on the back of the negative over the fault before beginning to work it up, as this tends to harmonise the *printing* effect with that of the gelatine film.

Some parts of a negative, although perfect in technique, may print rather too deeply in comparison with other parts, or the requirements of the picture. We equalise it by gumming *papier minéral* smoothly over the back of the negative, and, when dry, cutting through the paper with a sharp-pointed knife, round those portions requiring added strength, and an eighth of an inch or so outside of them to permit of a rough serrated edge being given, in order to prevent any line showing during printing. With architectural subjects, advantage should be taken of any dark lines which can be followed, in cutting straight ones by the aid of a flat rule. The cutting being finished, a little moisture is applied with a sponge over the portions to be removed. In a minute or two they will be found to strip off quite easily. This is the advantage of using gum as a cement. When *dry*, the edges can be serrated where desirable, and small bits of paper picked off over dense spots, or increased density may be given with a lead pencil.

At this stage clouds can be added, first, by drawing on the back of the negative those of a suitable pattern. If the negative happens to be *very dense*, clouds need be merely *outlined* in black varnish on the bare glass, this showing sufficiently strong to break up an even tint; more cannot be expected with such a rough-and-ready method—it is an improvement, and that is all that can be said for it. Clouds

added from separate negatives is by far the best plan. It frequently happens that clouds showing on the negative are not more than faintly indicated on the print. If the density of this portion of the negative is reduced, the probability is that the clouds will print, but print flat and poor; therefore, unless the development has been so managed that they have the proper relative intensity, it is better to neglect them, and print them in from another negative. It rarely happens with *ordinary* landscapes that the clouds cannot be much improved upon by selection, than contenting oneself with the original pattern as it appeared when the landscape was taken.

With moonlight views it is the general custom to attach a circular opaque disc or portion of one—to represent the moon—but on a much larger scale than the real moon appears, or ought to appear, the result is a round white patch no more like the moon than a plate, and does not convey the idea of solidity, distance, or space. We have been so accustomed to see the moon painted on this gigantic scale, that we *fancy* it all right. The same principle has been applied to distant mountains, but we are gradually realising the mistake. A moon on the correct scale will give expanse to the cloudscape, and, although it occupies such a small space, it is worth while to copy a suitable photograph and insert it, either by printing in or transference of film, the fact of giving solidity and rotundity to the moon more than makes up for its diminished size, adding much to the realistic appearance *especially* if shown as a lantern slide.

In architectural subjects, ornamental work, relieving against the sky, frequently merges into it and becomes lost; in such cases, it is advisable to stop out the sky entirely with opaque colour, *accurately* following the outline of such objects: where large spaces have to be treated, a favourite method is to paint a broad line round the object and fill up the space with opaque paper attached to the back of the negative: waste sensitised paper answers admirably, it can be roughly printed as a guide, cut out, and allowed to darken—a good opaque *water colour* will be found best for lining round, and black varnish for filling up smaller spaces, the reason black varnish is not used entirely for this purpose is because of its disposition to spread, unless of exactly the right consistency so encroaching on the work and obliterating it; but, independently of this, the difficulty of working an intricate edge with it is much greater than with water colour, to which it has almost universally given place for this particular purpose.

Coloured varnishes, made by the addition of a little aniline dye to spirit varnish and applied to the back of the negative, are often very useful, scraping it off over those parts that are already sufficiently dense. Ground-glass varnish used in the same way is good for slight alterations in intensity.

The powder process has heen highly spoken of as a method of improving negatives, but is rarely used in this process. The back of the negatives is covered with a coating of bichromated gum, or dextrine, exposed to the light, and dusted over with finely powdered plumbago, which adheres to those parts unacted on by the light in proportion to the gradations of the negative; the difficulty is in so regulating the hygroscopic nature of the film that the powder development shall be smooth and even, a little glycerine is added proportionate to the humidity of the atmosphere of the apartment in which the process is carried on. A successful worker states that he allows a drop of glycerine for each degree of moisture beyond a certain normal standard. If this process is used, it is requisite to protect the back of the negative carefully from abrasion during printing.

A very thin over-exposed negative can be made to give much improved results by making a very thin duplicate negative, and printing them in close contact, seeing, of course, if they are accurately registered. No matter what means of improvement is adopted, it is requisite that care and skill are exercised, combined with artistic knowledge, or, in all probability, the last state of the negative will be worse than the first.

EDWARD DUNMORE.

A LETTER FROM A YOUNG PHOTOGRAPHER TO "JUNIUS JUNIOR."

II.

JUNIUS JUNIOR ESQ.

RESPECTED SIR,—It is such a very long time since I heard from you that I am beginning to think you have forgotten me. I received the prints sent with your letter of September 21, and much regret that you would not keep them. I am afraid it was because I told you they were the only ones I had, but then, you know, I could have made copies. All the same, I was very glad to have them, because I have not since been able to secure quite the same effects. In order to see them properly, you should stand at a little distance and nearly close your eyes. Then their beauty and purport are seen as a revelation. You do not appear to have thought of this or you would have easily recognised them. One is of your own house. Acting on your advice, I sent them to the Salon, but, unfortunately, they arrived there a day too late. So I wrote to the Secretary of the Rejected Exhibition, for, you know, I have no false pride, and told him they were at his disposal. He replied that he had seen them, and that though, undoubtedly, they would have made the success of his show, he regretted that he was compelled to advise his committee to relinquish the project. Let me thank you for all the kind things you say about them. Some day, I will tell you all about the way the tones were produced. I shall probably patent the method when I have been able accurately to reproduce it, and shall be happy to give you a free licence to work it. I could not do less, as it is to you I owe all my success.

Photography is full of troubles. You always help me out of mine, and now I want to help you. Do you ever find in taking your plates out of the developing bath that they are broken in two? I do, and I have heard complaints of others of the same thing. I fear it is rather frequent and must be a cause of serious loss to many a struggling professional. I am always glad to help the professional and I have been experimenting as to the cause of this. You know, I told you I was attending our new evening continuation school, and that I had learnt there all about light, and that I now made my exposures accordingly. I have since learnt all about electricity, and the secret of the broken plates is this, there are electrical "lines of force," which issue from the north pole to the south pole and back again; they make the aurora borealis and other things. Well, I found my developing dish was placed across these lines of force.

Aunt Maria says it is just the same in bed, and that she can never sleep unless she is due north and south. So I now have a compass and place the developing dish accordingly, and the trouble of broken plates is not nearly as frequent as it was. Amateurs have done a great deal to advance the photographic art, and I give this to the world. Another thing I may probably give is about reducing negatives. I make my negatives dense in order to get good tones. Weak ones, as probably you know, won't produce them. Sometimes I get them too dense—my best negatives never take more than two days to print in anything like a good light—and I have to reduce them. I was showing one of them to my dealer the other day (he is also a professional photographer), and explaining to him the course to be adopted. I won't tell you at present what it is, but he assured me that it must produce the results I wanted, and that very few people would ever have thought of it. "But, then, you know," he added, "amateurs are such fools." I am sending you by this post one of my best negatives and one I have reduced, and you will see there is nothing to choose between them. That shows the perfection of the method. I am also experimenting in other directions for the benefit of the art.

But I mustn't forget to tell you that James, our curate, is very ill, and your last letter, which he happened to see, caused a relapse. You told me in it to photograph on a Sunday! Aunt Maria, who was nursing James, told mamma about it, and they said it proved that photographing led to Sabbath-breaking and other things. It was worse than smoking and drinking. James, as I wrote you, called on you the other Sunday to reason with you on your habit of exaggeration. I told you what Aunt said about it, and she was hoping that the tract she sent you would have done good.

But when James came back, looking so ill, and told her and mamma that he had actually found you, on that day, photographing, and that he had at once retraced his steps, feeling quite unequal to the responsibility of addressing such a man, they all said there was no hope. Aunt wants to know where you think you will go? And then came your letter, advising me to the same thing.

I am still working at the question I asked you in my last, "If a distance from the object of four feet requires an instantaneous exposure, what will nineteen and a half miles require?"

Until this is settled we are all working in the dark.—Yours, with many thanks,

RICHARD.

ASPHALTUM AND ETCHING.

[Anthony's International Annual.]

THE asphaltum process fer etching on metals is one of the greatest beauty and excellence. While much has been added and taken therefrom, the substantial elements remain much as they did when put in use forty years ago. The fact that asphaltum, or a certain portion of it, is highly sensitive to light, was known before even the salts of silver were used. Crude asphaltum, of almost any variety, is separated into two parts by making it as fine as possible in a mortar, and then dissolving it in ether. The portion dissolved is poured off. No particular care is observed up to this point, but the powdery compound that will not dissolve is carefully caught on a clean cloth filter. It soon becomes dry, and may be immediately dissolved in good benzine. The benzine is first deprived of any water it may contain by pouring it over and among some lumps of fresh lime; the asphaltum powder is now dissolved in it, and it is made of such a consistency, that, when it is poured on a sheet of zinc, copper

or steel, it will be of a light wine colour. Owing to the oily nature of the fluid, it will want to gather into stripes and ridges if not kept in gentle motion until it dries. The thicker or darker the fluid appears, the more troublesome it is to keep the coating even. A beginner will most likely get it too thick on the first trial, as he is apt to think that there is not enough of it. But it will etch well when the film is so thin as to be only well seen on the plate. The plate itself should be well cleaned with lye, and washed and dried before the coating is put on, or when the etching has proceeded a little the film will loosen and come off. When the etching is done in a battery (instead of acid), this is especially apt to occur. This may be well prevented by *heating* the plate before the first and each subsequent etching. The heating is not more than just feels uncomfortably warm to the hand, and may be done over a common lamp, if the plate is less than six inches square; if larger, then a regular hot plate of iron, on which the plate is laid when etching in a battery. The bath of sulphate of copper is the same as that used for making an electrotype, only that the plates are in opposite positions to that for electrotypy, on which the deposit is made. The cutting is more even than when done with acids and mordants, and can be controlled with the utmost nicety by separating the plates. There is some difficulty when the plates are suspended vertically, as the lower and upper portion of the bath act with differing energy, owing to the differing densities of the fluids, and the rising bubbles of gas which form little channels where they rise. This may be avoided by placing the plates horizontally, and separating them in any suitable way. The time will vary from eight or ten hours to a day or more, according to the depth and strength of the biting; stronger when they are near together, and speedier, more feeble, and less vigorous when further apart for fine lines, or *vice versâ* for coarser and stronger ones.

The first bath for etching with zinc is of nitric acid and water, about as strong as common vinegar, and during the first three bitings should not be made stronger if the lines are fine, or whether fine or not much of the clear perfection of the line depends on not forcing the etching too much at first, however the etching may be done. At the third or fourth biting we commence to use powdered resin or colophony, by dusting on with a fine soft brush, or laying the plate, face down, on a slab covered with the dust, after which the dust is heated until it just loses its dusty colour, when the etching is commenced again, increasing the strength of the bath at each second etching, or as may be required. When the finest lines are cut deep enough, they are covered with asphaltum, wax, or resin solutions, while the wider and coarser ones are bitten deeper, requiring sometimes twenty or thirty bitings, and dusting with the powder as often as the metal is too much exposed.

The development of an exposed and fully printed plate is something as follows: When first coated, they are set away for a day or two to harden and dry (if used too soon they sometimes stick to the negatives), and may then be laid away and used as required, keeping well for several months. The printing requires from a half to four hours in bright sunlight (printing in cloudy weather is uncertain). This fact has been the chief obstacle to the general use of this most perfect process. If the negative (reversed) is so strong as to prevent all light from coming through it except in the lines, they may be less carefully printed than if at all likely to let light through; if light gets through, it will be impossible to get a good development. The asphaltum lines printed by the open places of the negative are only faintly seen when fully printed more failures coming from under than over-printing. Sometimes the printing may be done in bad weather by coating the plate with gelatine, or albumen sensitised with three per cent. solution of bichromate of potash solution. When dry, the printing can be done in from six to twenty minutes, when it is (if gelatine) plunged in very hot water, when all the parts not acted on by light dissolve, exposing the coating of asphaltum. This can also be done over a coating of common resin. The development may be now commenced by using a sponge and a lather of soap—first going all over the plate with care. Then with a tuft of cotton dipped in sweet oil, and a drop of turpentine (be careful to use little turpentine, or it may loosen even the image lines if too strong), worked by a kind of soft dabbing, or patting, motion the asphaltum or resin will begin to loosen, and by keeping it patiently going the part unaffected by light will soon loosen and come off, leaving the hardened lines perfect and clear. The objection to using the gelatine is that the lines are a little coarser than when the asphaltum alone is used under the negative, and hence the work is not so smooth and perfect. No method of rolling up in ink, lithographically, ever produces the clear, perfect lines of the asphaltum alone, or renders such perfection of detail from a sharp, perfect negative.

With the heating of asphaltum, it becomes tarry or waxlike, and does not harden on cooling if much overheated, and this must be avoided. Half-tone plates are etched most perfectly by the asphaltum process, and better and clearer than by any other, that is, if the negatives are dense and clear, by the wet-plate process, though some slow gelatine process plates are successfully used, when sufficiently clear and dense. Some very fine negatives are made by hand, without the aid of the camera, by cutting through a light proof medium on glass. The drawing is done to appear as the resulting print is to be, *i.e.*, appearing as reversed negative would; and, owing to this circumstance, the draughtsman, or really the engraver, is materially helped, as he works naturally, without reversing, as in all other engraving drawings; and as the lines are of the utmost sharpness, and of any strength from fine to coarse, according to the dry points used, it has much to commend it for all kinds of letter and fine line work. With a good ground and practice it is better than any kind of pen work for copying by the camera ever can be, as all pen drawings have to be kept well open between the lines, or the ink joins and spoils them when the wet lines are at all close together. But by this plan lines may be placed so closely as to be too close and fine for ordinary printing purposes, and the result is a peculiar brightness about it that no pen drawing can ever possess. The drawing is no more tedious than by the pen, and considering that there is no after work, and that they can be made as large as the largest plate of glass or celluloid, exceeding in size any camera made, there is another advantage. The negatives can also be worked upon at any time, and additions or alterations made without damaging the existing work, when new editions are required, being thus valuable for mapping and many purposes. C. B. Talbot.

METHOD FOR RAPIDLY DETERMINING THE QUANTITY OF SILVER IN PHOTOGRAPHIC PREPARATIONS.

[Anthony's International Annual.]

The simplest method for determining the quantity of silver in any photographic preparation is to dissolve the silver salts in a solution of hyposulphite of soda, and then to estimate the silver by the method of titration.

The known titration methods with potassium iodide and starch paste, with sulphocyanide salts, or with sodium chloride, can find here no application, as no precipitation can be obtained from fixing soda solution. But a complete precipitation of the silver in the shape of black sulphide of silver will result from the addition of a sulphite of soda solution of known strength. I worked out a method, and have recommended it in my little book, *Guide to the Rational Collection of Silver, Gold, and Platinum Residues, and the Determination of their Value.* The process is the following: About thirty grains of crystallised sulphite of soda are dissolved in about one thousand cubic centimetres of water, and after eight days this solution is put into several bottles, well corked. A burette is now filled up to the zero mark with this solution. After this, exactly five grains of silver nitrate are dissolved in five hundred cubic centimetres of distilled water. After shaking, ten cubic centimetres of this silver nitrate solution, 1:100, are placed in a beaker and sulphite of soda solution added from the burette until no further precipitation is observed. By shaking the beaker occasionally a complete clearing of the cloudy liquid is easily obtained, and more sulphite solution is added drop by drop. Finally, the solution is heated, and then more sulphite is added in drops, until neither cloudiness nor discolouration is produced. This moment can accurately be determined. The number of cubic centimetres of sulphite of soda that have been used is read off from the burette, and the value of its action on the silver nitrate is calculated. If, for instance, 6·2 c. c. of sulphite of soda solution had been used, then will correspond:

6·2 c. c.	sulphite of soda	solution	to 10 c. c. silver solution, 1 : 100.
6·2 c. c.	,,	,,	to 0·1 gramme silver nitrate.
1 c. c.	,,	,,	to 0·0161 gramme silver nitrate.
1 c. c.	,,	,,	to 0·161 x 0·635 gramme silver.

By this preliminary work we find out, therefore, how much silver nitrate or silver corresponds to one cubic centimetre of our sulphite of soda solution. This titration is repeated until corresponding results vouch for its correctness. With the sulphite of soda solution, whose value has thus been determined, the quantity of silver in any fixing soda solution can be estimated. The above method, worked patiently and accurately, will give very satisfactory results. Prof. Alex. Lainer.

Mr. T. Widdop writes: "Will you kindly notify in your Journal that I have removed from 16, Burnaby-street, and that my address is now 17, Queen-street, Oldham, where I wish all communications in future to be forwarded."

GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

Annual Exhibition.

The affairs of this popular photographic Association continue to flourish. Since their previous Exhibition of last year not only has the members' roll been largely augmented, but very many distinct advances have been made by their indefatigable members of Council, who really do seem to have the best interest of the Association at heart.

The already commodious suite of rooms has this year been again added to by no less than two large apartments, fitted up specially as enlarging and operating rooms. By this addition to the accommodation the dark room is now set entirely apart for development only. Changing of plates is now no longer carried on in the developing room, but in a specially fitted-up apartment for this purpose.

Three new developing lamps, with sinks and benches, have been added to the previous accommodation, whilst a raised leaden platform has been constructed all round the developing benches, thus providing against any dampness to floors, &c. The lamps and washing taps are most conveniently situated to ensure the utmost ease when developing.

With the recent additions there is certainly no finer suite of apartments, if, indeed, they are at all approached by any other Society in the kingdom, and those associations contemplating fitting up similar rooms could not do better than pay a visit of inspection to the Glasgow and West of Scotland's rooms at 180, West Regent-street, where everything conducive to comfort and requisite to photography will certainly be seen up to date.

It is extremely gratifying to find such a capital exhibition of members t work as has been gathered together again this year, the entire space of ghe Association's rooms being taken up, without an unworthy photoraph being on the walls.

Following on their practice introduced last year, the members have this year again allotted the prizes by ballot, and this seems to have worked well this season also, the voting in nearly every instance being extremely close.

If any exception might be taken to the decision the members have arrived at, perhaps it is noticeable in the Portrait and Group Class, where Mr. Clark's admirable pictures are quite evidently undervalued, and, had the silver medal been awarded him instead of the bronze, his work would have been only properly recognised.

There are a great many new exhibitors this year, and the work as a whole is certainly a long way above previous years, and very many of the prize-takers in the past have either to take second honours or are entirely in the background.

In the Lantern Slide Class there were no less than fourteen competitors. The awards were made by testing the transparencies through the lantern, which took up no less than five hours' time before a final decision was arrived at. The silver medal goes to Mr. D. B. Johnstone for a very fine series. We understand it is the first occasion that he has exhibited.

The Instantaneous Class is also interesting, and it seems to have been a close run between Mr. Arch. Watson and Mr. N. G. Reid for first and second places. Mr. Reid, however, gets the silver medal.

Perhaps the best picture in the room is Mr. D. R. Clark's *A Summer's Eve*, and, had this gentleman's companion pictures been equally good, the silver medal in the Large Landscape Class must certainly have gone to him instead of Mr. Stewart Smith.

Annexed are the awards:—

Class I. (Landscape. Above Half-plate).—Silver medal (No. 5), *An Ayrshire Landscape; The Crofter's Home; Punting*, Stewart Smith. Bronze medal (No. 1), *Ben Ledi; The Massen; Vennachar Bridge*, Donald Dove.

Class II. (Landscape. Half-plate and under).—Silver medal (No. 33), *A Wintry Day; High Water; Early Spring*, Cameron Todd; (No. 32) *Meadows: Fisherman's Cottage; Cattle and Pond*, W. Marshall. Bronze medal (No. 13), 1. *Glen Sannox, Arran;* 2 and 3. *Green Water, Kilmalcolm*, Robert P. Rutherfurd.

Class III. (Portraits, Groups, and Figure Studies).—Silver medal (No. 38), Portrait; *Potato-gatherers;* Portrait, Stewart Smith. Bronze medal (No. 41), *Grandmotherly Advice; "Eh! ye auld rascal!" "What can a young lassie dae wi' an auld man?"* David R. Clark.

Class IV. (Instantaneous).—Silver medal (No. 59), Instantaneous Pictures, N. G. Reid. Bronze medal (No. 61), *A Herd of Goats; Storm Clouds; The End of the Day*, Arch. Watson.

Class V. (Enlargements).—Silver medal (No. 46), 1. *Reeds and Rushes;* 2 and 3. *Swans on Loch Tay*, James Russell. Bronze medal (No. 51), *Portrait of Mrs. James Couper; Portrait of a Child; Portrait of Captain Hill*, James Couper.

Class VI. (Hand camera).—Silver medal (No. 74), *Views on Shore and Esplanade at Rhyl, North Wales*, A. Lindsay Miller. Bronze medal (No. 75), Six Dutch Pictures, Robert F. Linn.

Class VII. (Lantern Slides).—Silver medal (No. 91), 1. *Ringford Mill;* 2. *"Fetch it, Frisky!"* 3. *The Stepping-stones;* 4. *Preparing for Market;* 5. *Dundrennan Abbey;* 6. *Notice!* D. B. Johnstone. Bronze medal (No. 93), 1. *On the Road—Loch Katrine;* 2. *Avenue near Bridge-of-Weir;* 3. *Olga;* 4. *River Balvaig;* 5. *Evening at Sea;* 6. *Rusgachan, near Strathyre*, J. C. Oliver.

Class VIII. (Stereoscopic and Window Transparencies).—Silver medal (No. 104), Stereoscopic Prints, P. Falconer. Bronze medal (No. 101), Stereoscopic transparencies: 1. *After a Shower;* 2. *On Culter Water;* 3. *On Culter Water;* 4. *A Rustic Bridge;* 5. *Birds of a Feather;* 6. *A Tidal River*, John W. Eadie.

Our Editorial Table.

Letts's Photographer's Diary.

This useful diary, which is edited by Mr. Hector Maclean, F. G. S., is this year again to the fore.

In the literary matter we find several pages devoted to such "Novelties and Improvements" as lenses, cameras, developers, plates, lanterns, papers, and other photographic paraphernalia. The formulæ for developers are comprehensive and carefully selected. It contains several tables and, outside of technical photography, much matter that is of interest to photographers, including all about postal matters. As a diary, each page is faced with blotting-paper, and ample space is left for entries. It has a good frontispiece—*A Scene in the Transvaal*—and is a good shilling's worth.

Workshop Receipts.

By Ernest Spon.

"The Workshop Series," that has been published by E. & F. N. Spon, 125, Strand, at intervals during the last twenty years, is very well known among all who have a taste for mechanical and scientific pursuits. The present volume, which is a new edition of the first series, treats of such topics as Alloys, Bookbinding, Cements, Drawings, Etching, Gun-cotton, Painting in Oils and Water, and much beside. A considerable amount of space is devoted to Photography, which is well treated throughout, discriminative selections being made from the works of various authors. The article, Plating, is also very long and comprehensive. The index alone comprises no fewer than twenty-four columns.

The Cadett "Lightning" Plate (H. & D. 194 speed) holds its own. This we are enabled to affirm from trials made of a sample received and used during the dark weather the metropolis has had to put up with in the Christmas week.

News and Notes.

Royal Photographic Society.—Ordinary Meeting, January 8, 1895, at 50, Great Russell-street, at eight p.m. *Standard Plates and some Causes of Apparent Alterations in Rapidity*, by Mr. John Sterry.

A Society for Rock Ferry.—A meeting of amateur photographers was held at Rock Ferry, Cheshire, on December 20, 1894, at which there was a large attendance. It was decided to form an amateur photographic society, and that it be called the "Rock Ferry Camera Club." The following officers were elected:—*President:* Mr. Samuel Cross.—*Vice-President:* Dr. R. E. W. Spratley.—*Hon. Treasurer:* Mr. R. G. Armstrong.—*Hon. Secretary:* Mr. R. Martin Smith, junr., Cavendish Park, Rock Ferry, and a Committee of six members. Meetings will be held fortnightly from January 21, 1895, at St. Peter's Hall, New Chester-road.

We are informed that an Exhibition, which should prove exceedingly interesting, is being arranged by Dr. Hall-Edwards for the forthcoming *Conversazione* at the Birmingham and Midland Institute. Its object is to demonstrate the recent advances in colour photography. The most popular exhibits will, undoubtedly, be the colour negatives of Messrs. Lumière and the colour transparencies of Dr. Joly of Dublin. Messrs. Lumière's pictures will be projected upon the screen by means of a powerful electric light, the current being furnished by the Birmingham Electric Supply Company. Specimens of chromatic, orthochromatic, and isochromatic photography will be on view, together with the latest phases of three-colour printing. Several firms have already promised their aid, including Messrs. Lumière, Messrs. Fuerst Brothers, The Britannia Company, The Photogram Company, Limited, and others. The Committee of the Institute have kindly consented to allow Dr. Hall-Edwards to invite the representative photographers of the city to an afternoon demonstration, invitations for which will shortly be circulated. The Exhibition will be open for four evenings (January 15 to 18), and should prove one of the most interesting items of the *Conversazione* programme.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 24,470.—"Improvements in Photographic Dark Slides." H. H. O'FARRELL.—*Dated December*, 1894.

No. 24,555.—"Improvements in Photo-chromoscopes or Photo-chromoscope Cameras." Complete specification. F. E. IVES.—*Dated December*, 1894.

No. 24,607.—"Improvements in Dark Slides or Plate-holders for Photographic Cameras." Complete specification. J. E. THORNTON and E. PICKARD.—*Dated December*, 1894.

No. 24,655.—"An Optical Lantern." F. ALSTON.—*Dated December*, 1894.

No. 24,793.—"Improvements in Double Backs for Photographic Cameras." J. WILSON.—*Dated December*, 1894.

No. 24,821.—"A Novel Stereoscopic Magic-lantern Apparatus." Complete specification. W. G. GROTTENDIECK.—*Dated December*, 1894.

No. 24,910.—"Improvements in or connected with Photographic Exposure Shutters." H. L. C. AUSBUTTEL.—*Dated December*, 1894.

No. 24,959.—"A New or Improved Collapsible Pocket Dark Cabinet or Receptacle, as a substitute for the usual photographic dark room or tent and ruby lamp." G. G. GRAY.—*Dated December*, 1894.

No. 24,973.—"An Improved Automatic Coin Machine for Exhibiting and Supplying Views, Photographs, or Natural Specimens." F. J. COCKS.—*Dated December*, 1894.

No. 25,000.—"Improvements in Instruments for Calculating Photographic Exposures." Complete specification. A. WATKINS.—*Dated December*, 1894.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
7	A. A. Camera Club	*The Work of the East-end Watch Committee.* C. R. Ashbee.
7	Camera Club	Smoking Concert.
7	North Middlesex	
7	Peterborough	
7	Putney	*How Popular Periodicals are Produced,* Illustrated by Lantern Slides.
7	Richmond	Lantern Evening.
7	South London	Lantern Evening. Mrs. Catherine Weed Ward.
7	Stereoscopic Club	
8	Birmingham Photo. Society	
8	Brixton and Clapham	Annual General Meeting.—*The Manipulation of the Optical Lantern.* B. E. Pinder.
8	Gospel Oak	*The Camera and How to Use it.*
8	Hackney	*"Still Life" Photography.* J. Carpenter.
8	Halifax Camera Club	Practical Demonstration on *Lantern Slides.* W. G. Thomson.
8	Manchester Amateur	
8	Munster	*Venice: the Queen City of the Adriatic Sea.* Dr. Ringrose Atkins.
8	Newcastle-on-Tyne & N. Counties	
8	Paisley	
8	Royal Photographic Society	*Standard Plates and some Causes of Apparent Alterations in Rapidity.* John Sterry.
8	Stockton	
9	Ipswich and Suffolk	
9	Leytonstone	
9	Photographic Club	Members' Open Night.
9	Southport	
9	Stockport	
10	Birkenhead Photo. Asso.	
10	Camera Club	*Rendering of Nature into Black and White.* Arthur Burchett.
10	Cheltenham	
10	Glossop Dale	
10	Hull	
10	Leicester and Leicestershire	
10	Liverpool Amateur	*Intensification and Reduction.* Mr. Anyon.
10	London and Provincial	Lantern Entertainment. S. J. Beckett.
10	Manchester Photo. Society	
10	Oldham	
10	West London	*Chiswick, Past and Present.* W. H. Whitear.
11	Bristol and West of England	Annual Meeting.—One Man Exhibition. W. C. Hemmons.
11	Cardiff	
11	Croydon Microscopical	
11	Holborn	
11	Ireland	*The Lens: its Varieties, its Functions, its Defects.* J. H. Hargrave and J. A. C. Ruthven.—*The Goerz and Zeiss Systems.* Dr. Scott.
11	Maidstone	
12	Hull	
12	Munster	Prize Slides.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 20,—Mr. F. B. Grundy in the chair.

Mr. S. G. Chapman was elected a member.

Mr. A. HADDON stated that a photograph, said to have been made on Whatman paper in 1851, by salting and sensitising, had been handed to him to ascertain whether there was any silver in those portions of the whites that had yellowed. The picture had been printed out and simply fixed. There was evidence of the presence of albumen in the print, in the sky portion of which he had succeeded in making two prints by first chlorising and then treating with potassium nitrite.

Mr. R. CHILD BAYLEY read a paper on *A Point in Connexion with Plate-coating* [see last number].

A discussion followed, in which the Chairman, Messrs. Everitt, Mackie, Debenham, Teape, and others took part.

Croydon Camera Club.—A crowded attendance at the Club-room on Wednesday, December 19, showed much interest in a process whereby photography is applicable to quite a large number of decorative purposes. The procedure was explained and illustrated by Mr. Ramsey, who indicated how clean glass, china, opal, wood, and other materials can, without any previous preparation, be beautified by applying transferotype prints. The method was considered a very useful one for obtaining enlarged negatives. After considerable questions and discussion, Mr. Ramsey was accorded a hearty vote of thanks. During the evening the President (Mr. H. Maclean, F.G.S.) took occasion to compliment Mr. J. Packham for his promising discovery, just made public, of the application of various tinctorial solutions to changing the colour of platinotype prints from black to various tones of brown, and added that Mr. Packham's discovery was one which reflected considerable lustre upon their Club, of which he was a member of several years' standing.

Widnes Photographic Society.—A Special Meeting was held December 26, 1894, for the exhibition of the lantern slides, produced by the members during the present year. Three prizes for the best three sets of slides having been offered by the President (Mr. V. C. Driffield), seventeen members competed, and, considering the fact that the majority of them were novices in this department of photographic work, a very fair show resulted. The slides were sent by Mr. Driffield to Mr. C. Hussey, the well-known expert, who had been good enough to undertake to adjudicate. Mr. Hussey not only awarded the prizes, but sent a very exhaustive criticism of each individual set. At his request, Major Lysaght also very kindly examined the slides, and fully confirmed Mr. Hussey's awards. The Exhibition afforded a most interesting object-lesson, and the award of the prizes gave universal satisfaction. At the close, a hearty vote of thanks was accorded to Mr. Hussey and Major Lysaght for their great kindness in judging and for the valuable advice given, and, the President having promised prizes for a similar competition during 1895, it is likely to be taken up enthusiastically. The prizes were awarded as follows:—1st, Mr. David Thomason, St. Helens; 2nd, divided for equal merit between Mr. W. Thomason, St. Helens, and Mr. A. E. Waring, Hon. Secretary Widnes Society; 3rd, Mr. Jesse Pilling, Widnes; hon. mention, Mr. George Rae, late, Hon. Secretary. A vote of thanks was accorded to the President for all the trouble he had taken in connexion with the competition.

Glasgow Photographic Association.—December 14, Mr. A. G. Adamson, of Adamson Bros., Buchanan-street, gave a demonstration of his patent *Incandescent System of Electric Light for Photography* to the members of the Glasgow Photographic Association, in his studio. Mr. John Stuart presided. —Mr. ADAMSON said: It is certainly a pleasure to come before a Glasgow audience. I must admit, however, that I shrank from it in the beginning, and perhaps an apology from me is more or less due to you in Glasgow for having gone further afield and given my first attention to London, but the saying about a prophet in his own country may have had something to do with it. Mr. Adamson then proceeded to explain that the chief difficulty he had had to struggle against amongst photographers was, perhaps, a not unnatural prejudice held by them against incandescent light, a prejudice which he was compelled to confess was in the beginning largely shared by himself. He graphically described his prolonged efforts to overcome the apparent inherent photographic weaknesses of the arc light. All kinds of lamps—automatic and hand-feed were tried in turn, only to be in turn abolished. The varying character of the light under all conditions tried; its total absence of all reliability either as to quantity or quality; and its flickering, hissing, and sparking (which completely upset both children and nervous sitters) rendered it, he found, quite unfit for use in a studio where the production of the work had to be considered in any connexion with business principles. In the end he felt constrained to abolish the arc light from his studio although he felt at the same time that an artificial light of a reliable character was becoming an absolute necessity owing to the photographic business drifting more towards the winter season, when daylight was of an equally unreliable character. This caused him to turn his attention to the incandescent lamp. Its great steadiness and its silence had attracted him, and he possessed a strong opinion that the incandescent lamp would give the required light, if only the means were known of taking it out of it. He then commenced a series of experiments, conducted over close upon five years, which had resulted in the production of the light demonstrated to the Association. Mr. Adamson made strong claims for his system of light against all other illuminants, daylight not excepted. He seemed to think this latter statement might cause some surprise, and carefully explained that, as practical photographers, his audience would not fail to appreciate his meaning when he said, owing to the great steadiness and reliability of the light, together with the extreme shortness of exposure, that the waste of either time or plates was reduced to a minimum, and was absolutely nil as compared to working by daylight, and the development could be carried out with perfect precision because of the exactness with which the exposure could be timed. What this constant quality of negative amounted to in the printing room would be specially appreciated by those present. Mr. Adamson also explained that many objections had been levelled against the system, mainly by outsiders. It had been stated, for instance, that the unusually large quantity of current consumed by the lamps would make it very costly in working. He effectually dispelled this objection by acceding to the President's wish that a reading of the meter be made before beginning. This was undertaken by two gentlemen (one of whom was Mr. White, who uses the Pilsen

arc lamp, and could therefore be intrusted as unbiassed in the matter), and it was found, after about 1¼ hours' running of 4·50 candle-power high-pressure lamps and ten exposures of the camera, that the amount of current consumed as indicated by the meter was 1¼ Board of Trade units, costing about 7½*d.* Deducting, therefore, the current consumed by the four focus lamps, the amount left for the ten exposures made amounted to 1⅜*d.*, or, roughly speaking, about ⅛*d.* per exposure. Theoretically, the quantity which ought to be consumed was ⅛*d.* for each exposure, but the result of the reading of the meter was considered most satisfactory, and Mr. White stated that the economy of this system over the Pilsen lamps was very marked indeed, as his accounts could show. Turning to the question of the life of the lamps, the demonstrator then explained that the objections lodged by outsiders on that point were wholly without foundation. The question, however, for photographers was simply whether the lamps would last until they paid themselves. In proof that they would do so, Mr. Adamson withdrew a set of new lamps from his reflector, and replaced them with a set which had been in use all last winter at his hotel studio and which had sustained about 6000 exposures. A negative was then made with these lamps, and it was demonstrated that the exposure was not required to be any longer than with the new lamps. He further explained that the lamps should sustain not less than 7200 exposures before showing any appreciable lessening of power. This test was also considered very satisfactory. During the course of the evening a number of very successful portraits were made, the audience greatly admiring the fine carrying power of the light and the soft modelling of the face. Mr. Adamson offered to make a group of the office-bearers of the Association, but the members preferred that a portrait of the President should be taken (which was done), and expressed themselves perfectly satisfied with the tests to which the light had been put. This brought the demonstration to a close, and the CHAIRMAN, in moving a vote of thanks, said: As some of you are going away, I think one and all must express their hearty thanks to Mr. Adamson for the demonstration he has given us to-night. I speak for myself, and I am more than satisfied with the result of his performances. I think there is a big future before him. There is not the shadow of a doubt that if photography, is to be made more effective this will be one of the means of bringing it into universal practice. You have the fact that you can at any time have your photograph taken, and there is no fear about the light. I think, when we hear the report from Mr. White as to the quantity of electric light consumed, it will be found that it is not at all costly. We cannot doubt what Mr. Adamson has told us, and I am sure that it will bear out what he has said, and I think that, taking it altogether, this system of lighting seems to me from my experience to be a long way ahead of anything that we have seen. The improvement that has been made upon this system as I see it to-night is certainly extraordinary compared with what I saw at first. Formerly the light was more dazzling, and not so soft and tender as it is at present. I do not speak from the point of one who has not thought something about the matter of artificial lighting. I claim the honour of being the first person who took a photograph in Glasgow with the electric light. I think I can see a face or two here who were present in the Trades Hall that night about twenty-five years ago when I manipulated an arc lamp and took photographs of several persons, and also of some pictures that were hanging on the wall. I have always felt an interest in the matter, and have thought a very great deal about it. I visited America and nine or ten studios there. I found none, of course, with the incandescent light at all; they were all ringing the changes upon the arc light in one form or another. I saw the lights in all shapes and forms, and I said to myself and others that I did not think the pictures that were taken by it were at all equal to what was done by daylight. We had not arrived then at the time when we could put out daylight, but I believe now that the time has arrived when the day of daylight, so far as practical photography is concerned, is gone, and I hope to see that Mr. Adamson will be successful in introducing the light into the studios of Glasgow, and I hope that he will not only be rewarded with praise by having done something for photography, but that he will be able to fill his pockets with dollars. That is possibly a thing that he does not care about, but I hope he is not too much of a genius to neglect the dollars, and all of us will be very glad to see that it brings them into his pockets. I ask you to accord a very hearty vote of thanks to Mr. Adamson for his demonstration to-night. Mr. WHITE: Gentlemen, the light has been burning 1¼ hours from the time we noted it from end to end, and Mr. Adamson has made ten exposures during the time. The amount consumed is only 1¼ units which is 7½*d.* worth. The CHAIRMAN: I think what Mr. White has said is a very good guarantee of the success of this system. Mr. White is a Pilsen man, and I thought he looked rather glum at the idea of this new light; but Mr. White is a practical man on the subject of the Pilsen, and I am sure his testimony will be taken as unbiassed that 7½*d.* is remarkably little for what we have seen done to-night.

Photographic Society of Japan.—November 9, Mr. C. D. West, M.A., in the chair.—The results of printing on Ilford printing-out paper were shown. The texture of the paper and the tint of the prints (commonly called by photographers "tone") were generally admired. The prints had been taken directly from the printing frames and placed dry in a mixture of a solution of hyposulphite of soda and chloride of gold with chalk to ensure neutrality. Dr. E. DIVERS, F.R.S., in answer to a question, stated that he considered there was no danger of "sulphur toning" in using such a bath. Mr. K. Ogawa showed a set of prints from negatives by Viscount Okabe, Vice-President of the Society, of views at Miyajima, and at Takao and Hozogawa, near Kyoto. Great artistic taste had, it was considered, been exhibited in selecting the subjects and the point of view. The Chairman showed an album containing many prints, the result of work during the past summer with a 5×4 hand camera. The prints were of a fine black tint, on matt-surface paper. It was explained that they were silver prints toned with platinum—in fact, prints by Lyonel Clark's process. Mr. R. Konishi presented to the Society samples of "tabloids" by Messrs. Burroughs, Welcome, & Co., of London, the brands being different from those that had before been sent directly to the Society by that firm. Messrs. W. K. Burton and M. Kondo showed prints by the Kallitype process. The tints were as good as those of platinotype, and excellent prints could be got from thin negatives. Mr. BURTON expressed the opinion that with the present enormously increased price of platinum the Kallitype process seemed a likely rival to the platinotype, and stated that, with the permission of the Society, Mr. Kondo and he would give a demonstration of the process at the regular meeting. A pair of prints, which had been sent to the Society by Mr. Marcus H. Rogers, were shown. They were on American Aristotype paper—a paper coated with a gelatino-chloride or collodio-chloride emulsion—and showed the very wide range of tones that could be got on that paper. The proceedings ended with a vote of thanks to the Chairman.

FORTHCOMING EXHIBITION.

1895.
March 25–30 ..... Brixton and Clapham Camera Club.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE EFFECT OF KEEPING PLATES AND FILMS AFTER EXPOSURE.

To the EDITOR.

SIR,—I notice a short article on the above subject, by Mr. W. H. Barnes, in the last number of the JOURNAL. As the plates and films tested were those of Messrs. B. J. Edwards, I am not surprised at the result. In the little experience I have had with varied plates and films, I have found these to be decidedly among the most stable. I cannot say that I have tested keeping qualities after exposure to any considerable extent, but I should expect to find that plates or films that prove themselves stable before exposure would be found to do so to a corresponding extent afterwards. I should think also that, where the instantaneous and isochromatic plates of any particular maker prove themselves stable, we may feel still more certain that his ordinary plates will do so, and probably that the films will follow the plates.

I have not tested any other plates to the same extent as those of Mr. Edwards, but what I have done leaves me little doubt that there are others equally stable. At the same time, I am persuaded that there are others, again, of which this cannot be said, even for the ordinary plates, still less so for the isochromatic. I think all such experiments as those of Mr. Barnes extremely interesting and valuable, and I suggest that he would render further good service if, during the coming year, he would continue to make similar experiments, using plates and films of different makers, especially of some of those who have a very large sale. It may be we should find with plates somewhat less stable a greater difference also between the films and the plates. There is, however, one question that arises in my mind, namely, whether in many cases where it has been thought that films have deteriorated in a measure beyond what plates would have done, the films may not have been kept in a manner and under conditions different to those that would have been adopted for the plates, seeing the arrangements for their use in the camera, &c., are often different from those of plates.—I am, yours, &c.,

London, December 22, 1894. W. WASHAM.

REMOVING HYPO STAINS.

To the EDITOR.

SIR,—In your last year's ALMANAC you inserted an article from me, suggesting that hypo stains on gelatine or albumenised paper could be removed by a careful use of an india-rubber ink-eraser, or even with plain rubber and patience. In the ALMANAC just issued, Mr. Gee proposes to do the same with pumice powder, removing the glaze from the *whole* of the print. This is not necessary with gelatine prints, as, if only slightly abraded, the surface can be restored by wetting it thoroughly and allowing it to dry. Wetting will also remove dents or scratches, to which gelatine prints are liable. Should the surface be much injured, I paint the spot with the gelatine solution I use for mounting, and when dry the spot cannot be discovered.

Having taken, as I thought, every possible precaution against my fingers or dishes being contaminated with hyposulphite of soda, I was at a loss to account for the stains appearing, till I found that, unknown to me, my toning dish had been placed inside the dish used for fixing. This shows the importance of washing the outside of dishes as well as the inside.—I am, yours, &c., D. W. HILL.

Silvermere, Woodberry Down, N., December 26, 1894.

TRANSMITTED IMAGES.

To the EDITOR.

SIR,—A short time ago, I had occasion to make a number of negatives in a very brief period, and as fast as they were exposed I placed them

face down in an empty plate box, to be developed later. As they were all face down, the films did not come in contact, but were separated by the thickness of glass; the plates were Seeds 26 X.

The next day, on developing the plates, I found that in several cases the image on the plate had been partly transmitted to the plate above it, and gave it the appearance of having a double exposure, although the false image was only about half as strong as the proper one. There was no possibility of my making a double exposure, as I used a single plate-holder, and changed the plate and numbered it after each exposure. It has been suggested to me that there might have been some phosphorescent substance in the glass, which was the means of making the second exposure on the upper plate. I have never had an occurrence of this kind, and have never heard of anything like it before. Perhaps some one can offer an explanation, and, if so, I will appreciate it highly. —I am, yours, &c., A. L. EIDEMILLER.

December 11, 1894.

PLATES *VERSUS* FILMS.

To the EDITOR.

SIR,—The comparative merits of plates and films seem to me to deserve more thorough comparison and experiment than they have thus far received, and, in such a way as my time and occupations permit, I endeavour to add to the data, and will make report. I have received from Dr. Smith, of Zurich, samples of plates and films coated with the same emulsion—his medium, or red brand; have tested them most carefully and exhaustively while still quite new, and am able to say with certainty that there is absolutely no difference in any quality between them. The question of the effect of time on them is yet to be tested, and I have put away the remnant of both films and plates to test at some future time. The test would have been more conclusive had they been coated with the most rapid emulsion, as I have little doubt that the emulsions of high sensitiveness suffer more by keeping, and especially on celluloid, than the slower ones.

The general question of the keeping qualities of emulsion coated on the celluloid films is satisfactorily settled to my mind for films of moderate and low sensitiveness, and I have lately been testing Carbutt films (Eclipse brand) which have been in my possession nearly two years, and show no other tendency to deterioration than a very slight veil if developed without bromide. I have tried, as well, orthochromatics of the same consignment, the former having been, Mr. Carbutt informs me, coated in 1892, and the latter a year earlier. With both I find it advisable to commence development with a little bromide in the pyro and potash developer. Of course anything like the rigid comparison I made with the Smith films is out of question, even as to the loss of sensitiveness, as the trials of a film last year cannot be put against those made this year with anything like scientific exactitude; but I have not found it necessary to give abnormally long exposures, either with the Eclipse or orthochromatic films. But the films I have yet had to operate on have in no case equalled the best films on glass in rapidity, even when new, so that it is impossible to say that the highest rapidity can be got with films, or can be retained if got. Mr. Carbutt sent me some time ago a piece of litmus paper which had been sealed between two strips of the ordinary films used by him, and which showed distinct evidence of acid in the celluloid. And this might be expected when we consider the composition of the celluloid, and the phenomena of decomposition usually manifested in pyroxyline kept in close-stoppered bottles in the old times. Mr. Carbutt found it necessary to finish the films with a soaking in alkali to eradicate this acid; but, in the case of long keeping, there is a high probability of the further decomposition of the celluloid, and the higher the sensitiveness of the emulsion employed the more delicate the balance of the negative and positive qualities of it, and the more amenable to the action of the acid evolved.

But this satisfaction results from the experiments thus far made, that films of a very satisfactory degree of sensitiveness can be kept, even in a hot and sultry climate, for two years and show no appreciable deterioration, which, for the traveller in distant countries, is an inestimable boon. —I am, yours, &c., W. J. STILLMAN.

Rome, December 30, 1894.

BLACKBALLING AT THE ROYAL.

To the EDITOR.

SIR,—As interest in the above-named matter appears to be on the wane, a further, and, as I hope, a final word from me seems to be expected, and I will ask your kind insertion of these few lines.

The whole matter has been of value to me as giving me further proof of how many staunch friends I possess in the photographic world; and it has also enabled me to name the few—the very few—who it appears have, without cause, so far as I can discover, constituted themselves my opponents.

The facts of the case are these:—

1st. I resigned my membership of the Photographic Society by letter at about the same time as several others—some three or more years ago.

2nd. A subsequent application for subscription I returned.

3rd. From that date, or thereabouts, I ceased to receive the transactions, or other usual notices of the Society, nor have I received them since.

4th. I received further applications for subscription, which, having returned once, and believing my name already removed from list of members, took no notice of.

5th. I paid for wall space at the Exhibition, which fee was received without comment, and it was not until some days after the late Exhibition was opened that I noticed my name asterisked in the catalogue as a member. I did not then think it worth while raising the question.

Shortly after my nomination this year, the Secretary wrote me, saying that the question had been raised as to my ever having resigned. I saw him, and made a similar statement to the one above. He subsequently told me in words to the effect that "it was all right, as they had found seven resignations recorded without the names being filled in, and one of them was believed to be mine."

On October 9, *at the Council Meeting, it was proposed and agreed "That Mr. A. Horsley Hinton's resignation be allowed, and that his nomination go forward."*

It appears that the Council expected some opposition to my election, and that on the ground of this misunderstanding, but no one saw how to disabuse the minds of any of those present. It is now the general opinion that, could such a step have been taken, the "blackballs" would have been reduced to three or four at most, and the general opinion is remarkably unanimous in suggesting who those three or four are, and how far the others were influenced by them.

Mr. James Sinclair has recently written a plain enough statement, and I am prepared to take his word for its veracity, but I would point out that, my nomination having passed the Council, Mr. Sinclair must have concluded either that the Council had found the alleged non-resignation to be untrue, or that the Council connived at my imputed attempt to defraud the Society. Mr. Sinclair must or should have known that the information he says he received was not authoritative, and whoever gave it evidently committed a grave indiscretion, and, if the matter were a more important one, I should be justified in taking a more serious view of what might prove so damaging a statement.

I must thank Mr. Sinclair for the opinion he must have of me, which is shown by the ready credence he gave to the tale. Of others whose remarks on the subject have appeared in print there need be little said—"Cosmos," "Radiant," and "One of the Blackballers," bear the appearance of coming from the same pen, and we know whose. This, if my memory serves me, exhausts the list of those who have written otherwise than in friendly tone, and I am happy to say that amongst those who have expressed regret, and even more, are the President, Vice-President, Hon. Secretary, and many others. My estimation of the Society as a whole is not altered in the least, perhaps the truest thing that has been said to me about the incident is, that "it serves me right for seeking to rejoin a Society I had seen good reason for leaving!"

I am sending a copy of this letter to the *Amateur Photographer*, *Photography*, and *Photographic News*, which I trust will be considered to sufficiently answer all letters and paragraphs which have appeared in print.—I am, yours, &c., A. HORSLEY HINTON.

Camera Club, December 31, 1894.

QUOTATIONS.

To the EDITOR.

SIR,—Permit me to congratulate you on the ALMANAC—it is excellent. The articles are concise and well written; the illustrations are good; it is brimful of useful and interesting information; and the advertisements make one wish that "money is no object." But there is one thing puzzles me. Why is it, when a writer on photographic matters makes a quotation, he generally gives the source of it incorrectly? For instance, on page 605 of the new ALMANAC, Mr. Cobb gives us an interesting article showing the great difference in the requirements for outdoor work in the old time and the present day, and writes, "But, as Mrs. Malaprop says, 'Comparisons are odorous.'" Now, Mrs. Malaprop does not use those words; a writer named Shakespeare makes Dogberry use that expression nearly two hundred years before Mrs. Malaprop was thought of. The words used by the lady named are, "No comparisons if you please, Miss; comparisons do not become a young woman." To give another example. Some time in October last, Mr. Dallmeyer wrote an indignant letter to a New Zealand paper, in reply to a charge made against him in its columns, and sent a copy for insertion in the JOURNAL. I sympathise with Mr. Dallmeyer, and think he had good cause to be indignant. In that letter he says: "As Longfellow somewhere says, 'A lie that is half the truth is always the basest of lies.'" Now, those words are not by Longfellow, but by Tennyson, and are to be found in his poem, "The Grandmother." Here are two instances in the past two months; with a little trouble I could hunt up numbers of them.

This may appear a small matter, but I submit, if a writer will give quotations, the least he can do is to give the source correctly.

To conclude, Mr. Editor, I trust neither yourself nor your staff have suffered from your arduous exertions of the past two months, and hope

you will have a good time, this festive season, as a reward for your labours. To paraphrase Tennyson, I will add the wish, that

"Though photographers may come, and photographers may go,
The JOURNAL and the ALMANAC may run on for ever."

I am, yours, &c.,

CHIPS.

A PHOTOGRAPHIC WEDDING.

To the EDITOR.

Sir,—In your various interesting comments on a recent lecture of mine, December 7 (pp. 769-771), you publish a sentence which strongly implies (doubtless inadvertently) that the process which I put forth as a new one is not new and is merely a disguised version of Mr. Warnerke's patent. I allude to the following words: "We have heard of something of this sort some years ago; a very rapid process for the production of typographic blocks *was said to be based upon this principle;* but, the deeper the matter was investigated, the stronger was the evidence that it was only a blind to hide the fact that a then existing patent was being utilised."

In calling your attention to the passage, I feel sure that you will have the courtesy to substantiate the statement or to withdraw its present obvious imputation.

Allow me to direct your attention to the *Proceedings Royal Photographic Society*, November 1892, p. 30, a glance at which will show that there are very important differences between Mr. Warnerke's process and mine which you have overlooked in your comments.—I am, yours, &c.,

HOWARD FARMER.

[We willingly endorse Mr. Farmer's courteous suggestion that the "imputation" he refers to was purely inadvertent.—ED.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

R. H. (Preston).—Your communication has been duly forwarded to the writer named.

D. R. L.—We should think the lamp (fig. 3) referred to would answer admirably.

PIONEER.—We think that your suggestion had better be brought before the Royal Photographic Society.

W. CARMICHAEL says: "Please say the publisher of *Knowledge through the Eye.*"—In reply: Messrs. Philip & Son, Fleet-street, E.C., are, we believe, the publishers.

STAINS says: "I have an unvarnished negative, the film of which has become stained with nitrate of silver, which renders it unprintable. Is there any means of removing the stains?"—Try King's solution sold by Marion & Co.

COUNTRYMAN.—4*s.* 6*d.* per ounce is far too much to pay for pyrogallic acid nowadays. From 1*s.* to 1*s.* 6*d.* is generally the price. It must be borne in mind that the village druggist's is not the best market for photographic chemicals.

J. LEACH.—We should certainly recommend you to join the Copyright Union and place the matter in its hands, instead of placing it in the hands of a local solicitor. By doing the former, you will obtain the advice of those who are *au fait* with copyright law.

H. HARRISON.—The grey tone in the lights of the bromide prints is clearly due to light. This is proved by the paper, where shielded by the mask, being as dark as should be the middle tints of the picture. If the developer was according to the formula quoted, the fault is not with that.

RICHARD.—1. Modern works on photography deal with the processes enumerated. Any of the large stock dealers will supply works dealing specially with the subjects mentioned. 2. To preserve the solution. Sulphate of soda will not do. 3. The condition of the emulsion, not the amount of silver.

T. W. C.—If you told your employer that you would leave if he did not give you the day before Christmas as a holiday, can you be surprised that he paid you off on the following Saturday? We very much doubt if you can recover a week's wages in lieu of notice. Try it on in the County Court if you like.

T. T.—We cannot give you the formula by which the plates are made. Manufacturers, if they told journalists their methods, would only do so in a confidential way, and not for publication. Formulæ for varnishes are given in the ALMANAC, but possibly none of them correspond with those by which some of the commercial varnishes are compounded.

C. R. J.—Keep the money in your pocket. As you offer to pay carriage both ways, and give satisfactory references, we suspect that the vendor has not much opinion of the quality of the instrument he wishes to dispose of. We ourselves should not think of paying several pounds for a lens with no maker's name upon it, without having the opportunity of trying it first. Thanks for seasonable greetings.

L. M. asks: "What is the rule for finding the number of times of enlargement, say, quarter-plate to 15×12? I thought it was four times, but that does not seem to work out right."—A table for enlargements will be found on page 944 of the current ALMANAC. The rule is this: Multiply the equivalent focus of the lens by the number of times of the enlargement, and add to the product the focus of the lens.

W. H. WALKER.—We should recommend you to build a daylight studio and adopt the electric light in that. Then you will be able to command artificial light when daylight fails. Good portraits can, of course, be taken by the electric light, but daylight, for some purposes, is preferable, especially when groups of several persons have to be taken. Either system is good. Our practical experience has been confined to the arc light. But we have seen excellent results that have been obtained with the incandescent system.

JOHN THOMPSON (Glasgow).—The portraits are about as good as could be expected considering the conditions under which they were taken. The value of the lenses will depend upon their quality; of that we have no means of judging. Try them both, and see which suits you best. Any optician will fit a lens to the opera glass. It will cost more to repolish the lens than a new one could be purchased for. If the two lenses are worked with a *f*-16 stop, the same exposure will be required with each.

S. EVERETT.—It is quite impossible to give even the faintest idea of the amount to be expected from four pounds and a quarter of residues, which have been carefully burnt and sifted in the manner we have suggested. The value depends entirely upon the amount of precious metals the wastes contain, not upon their gross weight. The residue may be heavy, yet the amount of silver small. Especially will this be the case with the printing-out papers, which are surfaced with barium sulphate. This is a heavy substance, and practically weighs as much after the paper is burnt as it did before, and, of course, adds greatly to the weight of the paper ash.

A. E. G. writes:—"I thank you for answering my last questions *re* studio. Will you please advise me as to the best material to use for blinds, which I am about to fit my new studio with? Last week you gave an inquirer advice to use green blinds; do you mean all the blinds to be green? As my studio has glass from end to end, I purpose putting each end blind five feet wide, and of black or dark green, the middle blinds three feet six inches wide, and of light material; could I do better? My glass is north, and light not in any way obstructed."—The colour of the blinds should be determined by the aspect of the studio. In that described, the two end blinds may be dark green or black as proposed, and the others white, or, preferably, light blue, this being more agreeable to the eye when the light is bright.

STUDIO writes as follows: "I am thinking of starting a studio (in a small way), and I should be glad if you would kindly let me have your opinion as to what camera and lens, and which size, would be the best for me to get, and what the cost would be. Of course, I should have some one to do the retouching, spotting, &c., and also to operate when I was away. I should like to know what salary I must expect to pay for a competent man, and if, in your opinion, I should be able to make it pay. I am thinking of sinking about 20*l.* for a start."—Our correspondent's query is a difficult one to answer, when the amount of capital to be invested is taken into consideration. He had better get price lists from some of the stock dealers, and select such apparatus as the means will allow of. Operators' and retouchers' salaries vary from about forty shillings a week upward, according to the degree of competency. With regard to whether our correspondent will be "able to make it pay," he must be in a much better position to form an opinion than we are.

*** *With this number of the* JOURNAL *is presented a portrait of the famous American author, Mr. Bret Harte. The negative was taken by Mr. Thomas Fall, of* 9, *Baker-street, and the reproduction is by the process of Messrs. Thévoz & Co., Geneva.*

CONTENTS.

	Page
LARGE APERTURES FOR LANDSCAPE LENSES	1
PHOTOGRAPHY FOR THE PRESS	1
THE METO-QUINONE DEVELOPER IN WINTER	2
ON THINGS IN GENERAL. By FREE LANCE	4
PREPARATION OF PLATINO-CHLORIDES. By G. E. BROWN, A.I.C.	5
PHOTO-MECHANICAL NOTES. By WILLIAM GAMBLE	5
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—I. By T. N. ARMSTRONG	6
APPARATUS FOR ENLARGEMENTS. By J. PIKE	7
VARIOUS METHODS OF IMPROVING NEGATIVES AND PRINTS. By EDWARD DUNMORE	9
A LETTER FROM A YOUNG PHOTOGRAPHER TO "JUNIUS JUNIOR." By RICHARD	10
ASPHALTUM AND ETCHING. By C. B. TALBOT	10
METHOD FOR RAPIDLY DETERMINING THE QUANTITY OF SILVER IN PHOTOGRAPHIC PREPARATIONS. By PROF. ALEX. LAINER	1
GLASGOW AND WEST OF SCOTLAND AMATEUR PHOTOGRAPHIC ASSOCIATION	12
OUR EDITORIAL TABLE	12
NEWS AND NOTES	12
RECENT PATENTS	13
MEETINGS OF SOCIETIES	13
FORTHCOMING EXHIBITION	14
CORRESPONDENCE	14
ANSWERS TO CORRESPONDENTS	16

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LENS MOUNTS IN ALUMINIUM.

After aluminium had been introduced, and its properties had been studied, great possibilities in connexion with its application to the mounting of optical instruments which required rigidity and lightness were anticipated. The weight of hand telescopes made of brass, and having an aperture of two inches and upwards, was found to be irksome, and help was sought for and occasionally obtained by the adaptation of tubes formed of *papier mâché* and vulcanite, while considerable numbers of one or two-draw telescopes, for use on board ship or on the seaboard, had their bodies formed of wood in order to attain lightness.

Who of ripe years does not remember the mechanical shifts had recourse to in order to reduce the weight of photographic lenses, especially those of large dimensions? One method consisted in having the front and back lens cells connected, not by a brass tube, but by four rigid wires of suitable length, over which was drawn a cylindrical hood of opaque textile material, such as black velvet. Single or landscape lenses occasionally had as their mount a similar hood, inside of which was a steel spiral spring of strength sufficient to keep the flexible hood distended, the diaphragm being contained in the flat head of the velvet cylinder, the whole capable of being pressed flat against the camera front in which the lens itself was fixed, and thus fulfilling the two *rôles* of lightness and portability. The earlier records of photographic optical history show us that a separate tripod stand, in addition to that sustaining the camera, has been employed for sustaining the weight of the lens alone.

Photographers—and we are not now referring to portraitists who work in studios, but to those who seek their subjects out of doors and often far afield—have great reason to bless the man who so greatly lightened the weight of their *impedimenta* by the substitution of aluminium for brass. Who is there that has not examined with admiration an illustration in one of our home opticians' advertisements in which the comparative weight of brass and aluminium is shown by a pair of scales, having in one scale five lenses mounted in the latter metal, and only one in the other, the greater number proving inadequate to the raising of the other?

Within a very brief period the problem of soldering aluminium to other metals has been satisfactorily solved. The other day we paid a visit to the brass and aluminium foundry of Messrs. Bowen & Co., Phœnix Works, Mount Pleasant, E.C., where Mr. Glegg, the managing partner, showed us many samples illustrative of what they have been able to achieve in this direction. These satisfied us in the most unmistakable manner that the junction of the new and light metal to copper, brass, zinc, and to itself, could be effected in the strongest and most substantial manner, and we were favoured further by being shown the extremely easy manner in which it was done. No flux is employed as in ordinary soldering, the only preparation of the aluminium being to remove any oxide on its surface by immersing it for one or two seconds in a jar of some cleansing liquid, followed by a rinsing in water. Being laid upon a hot metal plate, a stick of solder, brought into liquefaction by a blow-pipe, is rubbed over the portion to which adhesion of the piece to be joined is desired, and tinning is immediately effected, and in so great a degree of adhesion that when another piece not much thicker than paper is joined, *edge on*, to it, the solder will eventually tear asunder in its own substance sooner than be ripped off the aluminium when subjected to violence, and in testing the soundness of the junction we certainly did subject it to a considerable degree of violence. At the time of our visit preparations were being made for placing the aluminium solder on the market, when being brought into general use it will put an additional power into the hands of workers in that metal.

We are aware that, in early attempts made to effect the soldering of aluminium, only a partial adhesion was secured, and, as a consequence, the one metal could be stripped clean away from the other; but, as the result of exhaustive experiments with alloys, this has now been overcome, and the adhesion may be considered as permanent. Some of the junctions just referred to which we attempted to sever had been made twelve months ago, and had been kept, some in air and others in water, all of them withstanding the tests for separation.

This opens up a prospect of a useful application being made of aluminium in relation to optical instruments, and in a special manner to photographic lens mounts. Any one who has tried to cut screws on either the inside or the outside of aluminium tubes must be aware of the difficulty of doing so with anything approaching to a satisfactory result when contrasted with similar work on brass. We suggest, therefore, that such screwed work be made on thin rings of brass, which may be soldered in their places either previously or subsequently to cutting the screw on them. The advantage of this would be a much greater degree of durability than could possibly be hoped

for in an aluminium thread, which, owing to its softness, is apt to wear out soon, whereas we all know the staying power of brass in this respect. Were this adopted, the additional weight imparted to the mount would be inappreciable, while the strength imparted would be invaluable, especially to screws which have frequently to be undone, and, from the greater facility with which such screws can be cut on brass, it could scarcely fail in bringing about a reduction in the price of aluminium mounts, now, largely from its difficulty in working, so greatly in excess of similar work in brass, for, happily, the cost of tubes and casting in the lighter metal has become phenomenally low.

COMBINING NEGATIVES.

Frequently it happens, indeed more often than not, in taking groups of several or many persons, either in the studio or out of doors, that, however perfectly, photographically, the negative itself may be, some of the figures have moved during the exposure; and with some of those who have remained still the expressions are by no means satisfactory.

Generally, in the case of group pictures, they are taken on some special occasion, or for some particular object, and it is often impossible to retake them. Hence, perforce, the best has to be made of what has been done, be it good, bad, or indifferent. Usually, when a picture of this kind is taken, the operator, fully aware of the difficulties in the way, does not content himself with a single negative but takes a couple or more. Even when that is done, it is seldom that either negative is altogether satisfactory, as the probabilities are that some figures in the one negative have moved, while in the other they have been still. On the other hand, in the second negative, some have also moved that were motionless in the first. A case in point is illustrated, in a letter from a correspondent, now before us, and it is very typical of similar letters we from time to time receive. Of course, experienced photographers know quite well how to deal with such subjects, but clearly there are many outside the professional world, and probably some in it, who do not.

There are two methods by which the defective figures in one negative can be replaced by the perfect ones from the other. It is done in many instances by double printing, and that is a very good way if only a few prints are required. But, where a large number has to be produced, as is generally the case with group pictures, double printing becomes tedious, particularly at this season of the year. Therefore it is better to make a combined negative, in which the defective portraits in one plate are replaced by the perfect ones from the other, so that copies can be produced in the ordinary way. The little extra trouble involved in doing this is more than compensated for by that saved in double printing, to say nothing about the loss by spoilt prints, from want of register and other causes. This is the method of procedure.

First, make a transparency from each of the negatives, taking care to get them as nearly as possible of equal density. They may be made on dry plates, by the carbon or any other process; but, by whatever method they are produced, they must ultimately be in film form. If they are made on dry plates, the films can be readily stripped off by the method described by Mr. Thos. Bolas in the current Almanac. It will be well to make the transparencies on plates a trifle larger than the negatives, so as to have a little margin round the subject. The transparencies might be made on celluloid films, and that would obviate the necessity for stripping; but the celluloid is harder, and more difficult to cut through in the way to be described, than is a thin gelatine film. Having got perfectly satisfactory transparencies, this is how we proceed.

The most perfect of the two pictures is firmly secured, round the margin, to a clean plate of glass by gum paper or similar means. The defective figures are then neatly cut out with a sharp penknife. Next, the perfect figures in the other picture that are to replace them are also cut out, and then fixed in position with a slight touch of gum—though not on the face, but on the dress or other unimportant part. The simplest and best way to secure accuracy in the junctions in cutting out the figures is to superimpose the one transparency on the other in the proper position, and then with a thin and keen knife cut through the two films together with one clean cut. In this way an exact fit will be ensured without further trouble or after-trimming. This is more easily carried out with thin gelatine films than it is with celluloid, on account of its greater hardness.

In forming the junctions, a better result is often obtained by not making them close round the figure itself, if it can be done, but by making it through some less conspicuous part, such as the dresses or the background. In some instances it may be advisable to remove and replace more than the one figure, to the more effectually hide the joins. Should the junctions show at all—they will not if the work has been carefully carried out—they must be filled in with water colour such as Indian ink, for example. When a perfect transparency has been secured, all that remains is to make a negative, or any number of negatives, from it. That can be done either by contact printing or in the camera.

By this method it is quite easy to introduce into the group a portrait of a person who was absent when the picture was taken, and whose presence in it might materially enhance its value, and this is frequently done. All that is necessary is to obtain a negative of the individual, and then from it make a transparency and deal with it as above. If the portrait available is not on the same scale as the others, it is of little moment, because, if the transparency be made in the camera, it can be enlarged, or reduced, to the proper size as occasion may require.

DEVELOPING GELATINE NEGATIVES OF LINE SUBJECTS.

Without going into the question of the relative value of collodion and gelatine plates for the production of negatives for photo-mechanical purposes, it will be generally admitted that, however convenient the latter may be in other respects, there is, nevertheless, a difficulty in acquiring the extreme contrasts requisite in that class of work, or in retaining sufficient clearness in the transparent portions together with an adequate degree of opacity of deposit.

This is not a mere question of securing sufficient density, for that is easily attained in a variety of ways, but the difficulty supervenes in connexion with the retention of the clearness from fog, deposit, or stain of those parts of the image that should be represented by perfectly clear glass. This with collodion plates is a matter of comparative ease, for which reason wet plates are still almost universally employed in this branch of photography, though, while recognising the greater ease with which the desired result is obtained with those plates, we are far from condemning gelatine as being

useless for the purpose. So far back as fifteen or sixteen years ago we remember seeing negatives of line subjects produced upon gelatine plates that it would have been difficult to surpass with wet collodion, and Mr. Kennett showed us some similar reproductions which, while they were perfect as regards opacity, left very little to be desired in clearness and sharpness of the transparent lines.

In those early days, when the emulsions as a rule were much slower than at the present day, and the development differently conducted, it was perhaps an easier matter to combine density with clearness than it became later on, when the struggle for extreme rapidity commenced; indeed, excess of contrast from under-exposure and flatness from the reverse cause, were the Scylla and Charybdis between which the photographer of that period found it so difficult to steer. The remarkable power possessed by the new plates of searching out detail in the deepest shadows, with a very short exposure, was palpable to all, but it was some time before it came to be fully recognised that this feeble detail was not capable of the same proportionate degree of intensification, either during continued development or under separate treatment, as the better exposed portions of the image, and the plates themselves or the process, came to be blamed in very many instances where the real fault was simply under-exposure.

Later on, when quicker plates began to be made, and prolonged digestion, boiling, and treatment of the emulsion with ammonia came into vogue, the quality of the films, even the best commercial ones, for a time deteriorated to such an extent that they may have been said to have been utterly useless for the production of photo-mechanical negatives under any circumstances. Those who remember the plates of a dozen or more years ago will remember how difficult it was, except with a "full" exposure and well-restrained developer, to obtain clean, bright negatives of even ordinary subjects, and it only needs a reference to the journals of the day to find how many troubles in the shape of "green" and other fogs existed then that have practically disappeared now. In fact, at the present day the general run of plates obtained commercially are so perfect in character, so far as cleanness and freedom from fog are concerned, that we believe them to be quite as capable of producing perfect negatives for photo-mechanical purposes as wet collodion, if only those interested would take the trouble to alter their routine.

But, of course, for the altered class of work an entirely different method of working the plates must be adopted, and here is where, we feel sure, those who have tried and condemned gelatine for the purpose have gone astray. The wet-collodion worker, we know, is *obliged* to exercise a vast amount of care in all his operations in order to get a result at all, and we think, if he would give half as much thought and attention to gelatine and the conditions it requires, he would find his manipulatory troubles considerably lessened.

Given a thoroughly good gelatine plate, by which we mean one containing a fair amount of silver and perfectly free from inherent fog, the only difficulties that have to be contended against are liability of the gelatine to stain and the extreme sensitiveness of the film. The first, it is needless to say, by partially arresting the free passage of light through the transparent portions of the negative, is practically equivalent to and equally as bad as actual fog, detracting from the printing vigour of the negative, and, especially in the finer details, blocking up the lines. The excessive sensitiveness of the gelatino-bromide film also renders it more difficult to keep the fine lines clear for another reason; the light reflected from the ink lines of an engraving, feeble as it may be, suffices to impress the more sensitive gelatine film, while the tendency of the clear lines of the original to spread with the slightest symptom of over-exposure, and produce a sort of halation, tends still further to help to fill up that which should be clear lines in the negative.

These are points which the wet-plate operator even has to give a certain amount of attention to, but where he errs is in failing to recognise that, with the quicker films, he must go a step or two further. He has settled down into a certain routine which answers perfectly with wet collodion, and, when he tries gelatine under the same circumstances and fails, he naturally blames the process as useless. It was just the same when gelatine first began to supplant collodion for general work; photographers would try to adhere to their old system, and it was only slowly that the conviction grew upon them that they had to make a thorough change. If those who have hitherto failed with gelatine in photo-mechanical work will commence by recognising these facts, they will have taken the first step towards ultimate success.

In the matter of exposure for line negatives, the same rules prevail for gelatine as for wet collodion. There is a correct exposure which should be approximated to as closely as possible, as either over or under-exposure detracts more or less from the quality of result—the former by increasing the tendency to blocking the finer lines by spreading, and by reflected light; the latter, by necessitating a certain amount of forcing in development, which can only lead in the direction of fog or stain. Of the two, perhaps *slight* over-exposure is the preferable fault, as, if the excess be not great, it is comparatively easy to put on a check, whereas the intensification of an under-exposed and imperfect image can never give a satisfactory result.

Among developers we have nowadays a wide choice, although, for the purpose under discussion, the selection of the really best is not much easier than for general work. For capability of giving density, and for general all-round qualities, pyro unmistakably still retains premier position, and, were it not for its unfortunate tendency to stain, it would for this purpose be entirely without a rival. But, do what we will in the way of full exposure and the use of sodium sulphite, the yellow stain will occasionally appear, perhaps unexpectedly, though, if the circumstances be carefully inquired into, there will usually be an explanation forthcoming. Where discolouration does occur, it will generally be in the case of under-exposure, or probably it may ensue from the nature of the subject being copied. If, for instance, this be an engraving, including very fine and delicate work, requiring a comparatively short exposure to prevent filling up of the lines, as well as deep, heavy shadows, the development will have to be, to a certain extent, forced in order to satisfactorily render the shadows. At the same time, it will not be possible to employ a weak solution, long applied, as this would inevitably lead to the filling up of the finer lines; in fact, the better plan is to develop quickly with a strong solution, in the hope of getting strength in the shadows before the fine lines have time to block. But, unfortunately, it is the strong solutions that chiefly produce the stain.

If hydroquinone, which has also a reputation for density, be substituted for pyro, the tendency to stain, except in cases of very great under-exposure, is altogether absent, but other difficulties arise. This developer under ordinary circumstances

—*i.e.*, when used with the alkaline carbonate—is, as is well known, very slow in action. This would not be a matter of any great moment were it not that, under such circumstances, except with a very full exposure, there is also great difficulty in obtaining density in the lighter portions of the picture—in other words, a strong leaning in the direction of excessive contrast or hardness. With such a developer, therefore, the finer lines stand an even stronger chance of being blocked than when pyro is used.

Should we substitute caustic alkali for the carbonate, the general result is better, at any rate as regards rapidity of action and harmony of development, but with the increased energy comes a tendency to veil in the transparent portions of the image, and except in subjects of a very even character—*i.e.*, possessing no very violent contrasts—hydroquinone with caustic alkali is not to be recommended.

When the subject is of the kind just mentioned, however, no difficulty need be experienced in using either pyro or hydroquinone. If pyro, it should be used in conjunction with a full dose of sulphite, at least five or six grains to each ounce of pyro, as well as a liberal proportion of restraining bromide. The strength of the pyro should be adjusted to the character of the subject, making it proportionally weaker as the contrast in the subject to be copied increases, or as the risk of the finer lines being blocked appears greater. If there be no particularly delicate portions, then the pyro may be three or four grains to the ounce. The strength of the alkali, preferably carbonate of potash, must in all cases be kept down as low as the character of the subject will permit, increasing it, in order to hasten the development, when there is a likelihood of any portions of the picture being blocked if the development be too prolonged.

Some years ago, in these columns, we recommended the addition of gallic acid to the ordinary pyro developer in all cases where great density is required, and for photo-mechanical work it answers admirably, as, in addition to the increase of density, it keeps the shadows clean, and prevents the blocking of the finer lines during a very protracted development. A solution of gallic acid, from two grains to the ounce up to saturation—the precise strength does not matter much—may be kept in stock and used in place of plain water for mixing the developer.

If hydroquinone be used in conjunction with what may be called normal subjects, caustic alkali is preferable to carbonate, as it acts more uniformly upon the differently exposed parts of the picture, bringing up the darker portions without the necessity of a protracted application which might fill up the finer lines. It must, however, be held well in check, with restraining bromide, in order to keep the transparent lines clear and free from fog.

Change in Astronomical Journals.—For upwards of a dozen years M. Flammarion has ably edited the well-known journal, *L'Astronomie*, in a popular style, but it is announced that, owing to administrative difficulties, it will cease to exist. To make up for the loss, the French Astronomical Society will, however, issue their *Bulletin* monthly, instead of, as hitherto, quarterly. In America the well-known *Astronomy and Astro-physics*, which has included so many valuable articles connected with photographic work, will in future be called *Astro-physics*.

Collodio-chloride for Transparencies.—Mr. J. S. Teape read a paper on this subject at the meeting of the London and Provincial Photographic Association on January 3, which will be found in another part of the JOURNAL. Employing zinc chloride as the chloride, Mr. Teape was able to prepare an emulsion that developed without fog, whereas, with the various other chlorides that he tried in his experiments, he was unable to avoid it. The colours and qualities of the transparencies he showed in illustration of his remarks were exceedingly fine. Mr. Teape's paper is as concise and clear as it is practical, and it should help to popularise developed collodio-chloride for transparency-making, especially among amateurs. The process, as will be observed, is simple in the extreme.

A Geological Camera.—At the December meeting of the Geological Society, Mr. J. Bridges Lee described a new instrument for surveying by the aid of photography—a matter of growing importance, as may be evidenced by the fact that at a recent meeting of the Paris Academy of Sciences a paper by M. Laussedat was read on the results of a photographic survey to show the boundary line between Alaska and British Columbia. Mr. Lee's instrument is a camera fitted inside with a magnetic needle carrying a vertical transparent scale, divided into 360°, and with cross fibres intersecting at right angles. The camera is arranged for exact levelling, and can be pointed in any direction. The upright fibre throws a shadow on the film, and thus appears in the negative, serving firstly as an index to read the bearing, and secondly, by means of its recording shadow, to mark the medium vertical plane on the image. The horizontal fibre is arranged to show on the negative the horizontal plane which bisects the lens.

Cellulose Moisture.—Recently we called attention to the measurements made by Mr. Claydon Beadle on the absorption of moisture by cellulose, and pointed out their bearing upon the results of pyroxyline manufactured, and we have now to call attention to some further exact results recorded by him in the *Chemical News* for the 4th inst. It is not necessary for us to quote his columns of exact results, showing as they do a gain of almost three per cent. in ten minutes, and over six per cent. in an hour. It is quite sufficient to show the absolute need for working with cotton-wool in a definite state of hydration, if the term may be used, if even regular results are to be looked for in the nitro-cellulose obtained. But a further interesting fact is shown by him to take place. Not only does dry cellulose gain in weight, but, during the absorption, a rise in temperature takes place. The amount of rise varied according to the conditions, and in some cases reached five degrees Fahr. increase in ten minutes' time. We have here an ample supply of acts to account for the difficulty usually experienced in making a number of batches of pryroxyline of uniform quality and texture.

Photography and Shipwrecks.—The following graphic account of the uses of photography in shipwrecks is taken from our contemporary, Sharland's *New Zealand Photographer*:—

"Never in the brief history of our colony has such a terrible calamity as the wreck of the *Wairarapa* so completely overwhelmed the country with such sincere feelings of deep and sorrowful sympathy. As soon as it was known in Auckland that a steamer was to leave for the scene of the wreck, some of the younger and more adventurous of our local photographers prepared for action. As the steamer was dispatched for the purpose of recovering the bodies lost in that awful disaster, the expedition was probably one of the saddest and most distressing in the history of photography, and the fearsome sights which revealed such horrible tales of intense agony in the death struggles of brave men and helpless women were enough to appal the stoutest heart. The wreck lay with her head tightly wedged between some low shelving rocks at the base of an immense precipice, and a long shot from the deck of the visiting steamer was almost useless. The only way to secure a negative was to land upon the little ledges of rock which on either side of the ill-fated ship afforded such perilous and precarious foothold. Fortunately the sea was calm, and, although landing was attended with no little difficulty and some danger, and the hazardous photographers were many times drenched by the ocean swell, some very good negatives were secured by Messrs. H. G. Holland, C. Mackie, and H. Smith. These photographs, while they reveal to some slight extent the terrible nature of the catastrophe, make us wonder how, in the presence of that fearful sea, any living soul could have escaped to tell the tale of that awful crash. Mr. J. R. Hanna has taken some excellent portrait groups of the survivors, and Mr. T. Ryan

has taken a series of negatives on the spot for Mr. Josiah Martin. The newspapers were ravenously eager for photographs and sketches. Martin's views of the steamer, and of the scene of the disaster, were in great demand, and in an incredibly short time numerous excellent type blocks were prepared, and illustrated descriptions of the event supplied to the public, with the fullest particulars of this our greatest national and domestic calamity."

A New Voltaic Battery.—In the *Chemical News*, under the heading, "A Revolution in Voltaic Electricity," Mr. H. W. Warren, research analyst, describes a new battery he has invented, which, if all he claims be true, will be just the instrument required for photographic operations requiring a small, constant, and easily produced electric light. It is not described in detail, but we assume it is to be placed upon the market. The battery is capable of firing three volts, and producing a constant current of from 2 to 2·5 for almost unlimited duration, costs less than a penny for ten hours' action, and is entirely free from fuming acid, like Grove's or Bunsen's require. The carbon is impregnated with boron. A flat porous cell encloses the zinc element, while the outer cell contains a special magnetic salt in admixture with other substances. With twelve cells he was able to raise two feet of platinum wire to incandescence, or to volatilise platinum and other metals in the arc. "As a lighting agent for small or large lamps, they are unrivalled, while the absence of fumes allows of their presence in dwellings, conservatories, or places of a like nature." We shall hope to hear more of an invention which should be of great value in many photographic operations.

JOTTINGS.

"Who *is* 'Cosmos'?" seems to be one of the questions of the hour in the photographic world. The editor of a contemporary says that I "personify" the editorial staff of this Journal. I don't. "My lord," exclaimed the astounding "sculptor," Mr. Richard Charles Belt, at a memorable stage of a memorable trial, thirteen years ago, "my mind alone conceived the work; my hand alone executed it!" That's my case. Then, Mr. Horsley Hinton seems to think that "Cosmos," "Radiant," and "One of the Blackballers" are a kind of journalistic trinity—three in one. They're not. Still, my thanks are due to Mr. Hinton for sparing me what would have been the unkindest accusation of all, that of also being "Zoilus." From such a fate most devoutly do I cry, "Good Lord, deliver me!"

But not all my critics and correspondents say nasty things of me. Here, for example, is a gentleman, Mr. R. H. Preston, who calls me "witty and clever," and draws my attention to a circular which he encloses. This is all about the "Regal" magazine hand camera, with finder, which sells at the amazing sum of half-a-crown! The developing and printing outfit and the "Regal" enlarger are correspondingly cheap, and are, no doubt, relatively as good. The most curious part of the circular, however, is the address of the vendors of the "Regal." It runs: "Please address all communications, The Churchwardens, St. Chad's Vestry, Everton, Liverpool." I suppose, for I am not sure, that a churchwarden is something to do with a church; and, if that be the case, I should like to ask His Grace the Archbishop of York whether it be quite the thing for churchwardens to turn their churches or vestries into markets for cheap cameras? In addition to the opinion of Dr. Maclagan on this matter, I should also like to have that of the Liberation Society, as well as the feeling of the photographic trade on so peculiar a phase of competition. The implied combination of piety and photography makes one think of the doings that went on in the Temple about 2000 years ago, before it was suddenly and indignantly cleared.

Quite the biggest thing in photography this year will probably be the special Exhibition of photography in its application to the arts, sciences, and industries throughout the Empire, to be held at the Imperial Institute from May to September next. The whole scheme has evidently been well thought out, and the manner in which it is intended to divide and subdivide the display could not, I think, have been improved upon. With photography fully illustrated in its historical, artistic, industrial, scientific, educational, and miscellaneous aspects, by representative exhibits, the benefits likely to accrue to it are bound to be great. Vast numbers of the non-photographic public will, it is to be hoped, learn, at last, what a large space photography fills in modern life, while the good educational effects and results the Exhibition is likely to have are sure to be very wide. Commercially regarded, I anticipate nothing but subsequent satisfactory influences from the Exhibition, which, indeed, if it be anything like the success that it deserves to be, will in all probability mark the date of a new boom in photography all round. Such an opportunity as this was badly wanted by photography, and only an institution of the capacities of the Imperial Institute could satisfactorily take the Exhibition in hand.

There is a passage in Mr. Stillman's very interesting letter on the keeping properties of films, appearing in the last number of the Journal, upon which I will make a remark. He says that "it is impossible to say that the highest rapidity can be got with films, or can be retained if got." A little experience I had last summer seems rather to contra-indicate this view. I was out with a hand camera. This was loaded, partly with plates, partly with films. The former I knew had not been made more than a fortnight; their rapidity was 24° Warnerke. The films were marked with the same speed number; they had been in my possession eighteen months, and had been made at least two years. Identical exposures were given throughout, and on development all the negatives alike on plates and films were fully exposed, no variation between the plates and films being discernible. In the face of all that we hear as to the alleged deterioration in sensitiveness which films undergo by keeping, this little fact may be of interest. I have in my possession unexposed films three and four years old, and at an early opportunity intend to repeat this experiment. On all hands, films are so convenient that it is desirable their alleged drawbacks should be thoroughly well substantiated before they are accepted as facts.

At the meeting of the Croydon Camera Club, on December 19, we are informed that "the President took occasion to compliment Mr. J. Packham for his promising discovery, just made public, of the application of various tinctorial solutions to changing the colour of platinotype prints from black to various tones of brown." I have not the specification of Mr. Packham's patent at hand to refer to, so that I am unable to notice his claims; but I take the opportunity of saying that I myself have used two very common, and at the same time very effective, infusions, for the same purpose, namely, tea and coffee. By these means quite the appearance of a very ancient engraving is given to a platinum print, especially if it be a suitable reproduction. In reference to the last point, I have in mind, and indeed I have a copy of it in my possession, a platinotype reproduction of the well-known subject, *The Smoakers' Club*, by Dr. Reynolds, the President of the Brixton and Clapham Camera Club, and treated, I believe, with either tea or coffee, which looks for all the world as if it were an engraving mellowed down by that most potent of tinctorial solutions—old Time, to wit. The principle of Mr. Packham's "discovery" is, therefore, not new.

Well done, members of the California Camera Club! From a copy of a 'Frisco paper of December 19 that has happened my way, I learn that, in the big city of the Pacific slope, a fund was got up in aid of the poor children at Christmastide, and that the local Camera Club was well to the fore in the good work. "The California Camera Club," says the paper, "has taken hold of the 'Little Jim' Fund in earnest. Not content with offering to show to the public for the extraordinary low admission fee of 25 cents the finest set of slides that has ever been shown in San Francisco, a strong appeal has been made to the Club pride of the members. Every member of the Club is putting forth his best efforts. A spirited, though friendly, rivalry has sprung up among the members in the sale of tickets, and the first query at the meeting of the members is, 'How many did you sell to-day?' At the foot of every notice which goes from the

Secretary's office is this: 'What are you doing for the "Little Jim' Fund. And they are all doing something. Those who 'can't sell tickets' are devoting hours to the making of elegant slides from the negatives selected from the hundreds which have been sent in; and the subscribing members are no less enthusiastic. To each subscribing member four tickets were sent to be sold. The tickets had hardly reached their destinations when there began to come in requests for additional tickets. One subscribing member wrote that the four tickets sent did not last long enough to be counted, and he wanted twenty more at once." I commend this kindly action of the California Camera Club to the notice of the two or three hundred British photographic societies, which might do much good in the direction of social charity and benevolence, if they would but utilise their opportunities.

The drawbacks of being, like Mr. Lillyvick, the water-rate collector in "Nicholas Nickleby," a "public character," are many and varied. An anonymous correspondent, who takes exception to some remarks in my last "Jottings," recommends me to "swallow a pailful of liver-pills and be d——d!" I am not afflicted with the liver complaint; as for the rest, all in good time, my friend. Another (who signs his name) says it is rumoured I am a candidate for the Linked Ring, and that if I put up I shall be unanimously blackballed. I don't believe that; do you, Mr. Maskell? A friend says there is a fund started for the purpose of effecting my assassination. What larx! But the meanest and most uncharitable act of all was that of a shy and secret well-wisher who sent me a Christmas present of which he omitted to pay the carriage. It was a neatly made up little box, and it contained some yards of stout rope, some cyanide, and a small coffin with an inscription, *Hic jacet Cosmos.* Such, my friends, are the penalties of virtue! COSMOS.

FROM SUNSHINE TO SHADOW AND BACK.

IT is several years ago since, in the BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, I first suggested that, as a starting-point or zero from which plus and minus densities could be measured or computed, the "neutral" phrase of *no-image* was preferable to the "normal" every-day negative, and to the seemingly abnormal "reversal." In this conviction, of recent years, observation and experiment have confirmed me.

A negative is a means to an end. That end is a print. A perfect negative is one which is capable of allowing a perfect print to be made from it. It is simply to beat the air to attempt to define a good negative as one that truly represents the gradations of light and shade in the subject. The range of contrast exhibited by the vast bulk of subjects, and the laws regulating image-formation on silver salts generally, preclude its applicability, save within very narrow and extrinsic limits.

In printing out, the action—reduction—is imperceptibly anabolic, but, very evidently, katabolic. For equal differences in light intensity, or when the intensity of the light remains the same, for equal differences in lapse of time (*i.e.*, "exposure"), the salt in a print is reduced quickly at first, but ever afterwards with a retarded velocity.

In development, from the moment the plate is immersed to its final withdrawal, both kinds of change are equally conspicuous. That is to say, that with a correctly exposed and developed negative, the supply of formative material is evidently equal to the demand of the reduced nucleus. Conversely, with a correctly exposed and developed negative, the demand for formative material is precisely equal to the requirements of the reduced nucleus.

In printing out, we may consider the supply of silver salt as alone limiting the extent of the ultimate action. (I say this advisedly.)

In development, we must observe that the exhaustion of the silver salt and of the strength of the developer are concurrent. Nevertheless, taken separately, the action of light and the action of a developer are of the same nature throughout. Maintain the strength of each, and the direction in which each acts is always the same. Neither reverses its action from first to last. The work may be done, or the toil may be in vain, but, as long as it endures, the energy cannot be diverted from the one task.

What is a "developer," "revealer," or "continuer," unless it be something which expresses, in units of density, the amount of light which has reached the film?

What is "exposure" or "insolation" save a test of the strength of a developer, stated in the same terms?

The sensitive plate may thus be regarded as a slate upon which certain sums are worked out:—

$$0{\cdot}1+0{\cdot}9=1,\ 0{\cdot}2+0{\cdot}8=1,$$
$$0{\cdot}3+0{\cdot}7=1,\ 0{\cdot}4+0{\cdot}6=1,$$

and

$$0{\cdot}5+0{\cdot}5=1.$$

Now, let $0{\cdot}5+0{\cdot}5$ symbolise a condition of equipoise. First, in order to attain sensitiveness, we must have the metal and halogen nicely balanced. Next, so that we may make sure of obtaining the particular form of image we desire, we must have the exposure and development nicely balanced. Finally, if we aim at at a broad mental grasp of that which constitutes photography, we must look upon the two extreme forms of image, viz., negative (normal) and positive (reversal), as if they also, at a certain stage of their ups and downs—their increase and decrease of density, their integration and disintegration—were nicely balanced:—

$$0{\cdot}5+0{\cdot}5.$$

Again, I repeat that the negative image is only a means to an end. The positive image is also a means to an end. What essential difference is there, for instance, between perfection in an ordinary negative and perfection in a lantern slide, or a transparency from which an enlarged negative is to be made? From one standpoint, of course, a good deal; from another, none at all. Now, I—although I have frequently made negatives from negatives, and lantern slides from lantern slides, directly, by developing the plate exposed under the picture whose counterpart I wished to possess—for the purpose I have in hand, require another form of image still. Luckily for me, it is not difficult to produce, though by no means easy to produce in perfection. I refer, of course, to the "neutral phase," that "no-image," that density without detail, obtained by exposing a plate upon a subject exhibiting contrast—such as a draught-board—and then developing, as usual. This form of "image" affords the finest opportunities for testing the efficacy of "compensation," for, with the chemicals in every-day use as the ingredients of a developer, we can, at will, decide, and having decided, bring out, from one and the same exposure, either an example of the extremes of opacity and transparency, called a negative or positive, or stop short only when both the increasing darkening of the shadows and the increasing clearing of the high lights have reached mean density,

$$0{\cdot}5+0{\cdot}5,$$

and from *this* equipoise we can determine, in units of developer, the value of a unit of light, or *vice versâ*.

If a very large dry plate be cut into a considerable number of pieces, and these pieces be exposed, wholly uncovered, for greatly differing periods, and then be developed side by side in the same developer, so that all have received the same immersion, it will be seen, when they are fixed, that the degree of density acquired is by no means proportionate to the duration of the exposure, some of the films which received protracted exposures being found to be almost perfectly clear, whilst the greatest densities are obtained either with very short exposures, or else with exposures longer than those which give mean and least densities. But with this method of exhibiting solarisation or reversal we have no contrast on any single film. By protecting a portion of each film by an opaque, straight-edged screen, and otherwise exposing, developing, and fixing as before, we are enabled to observe the same general manifestations as at first, but with this difference, that we have two portions of each film alternately behaving in apparently the same way as did the whole of each film in the case we originally considered. Moreover, when we use the screen, halation can be studied in its simplest and most unmistakable form. Nevertheless, I hold that the characteristics of halation and solarisation can be best examined simultaneously by means of small aperture images, and minute images of sources of light, great or small, projected on the film by a lens.

For the time being, as I am anxious to avoid all discussion of that, to many, moot point, "What is the chief cause of halation?" I will confine myself to the expression of my belief that, although reflection from the back of the glass support is the most fruitful source, the only essential source is, in all probability, that which may be defined as the scattering of the rays of light by the aggregated particles of silver-salt suspended in the translucent film. (*Abney.*) Farther, I would wish to point out that, though "interference" may modify the aspect in which halation may present itself, it cannot be made accountable for its existence.

But, in photography, halation is not the result of light action

alone, but of light and development. And the same may be said with equal force of reversal.

Is there, then, no connexion between these two phenomena? Are halation and reversal not inter-dependent one upon the other? Certainly, at first, halation precedes reversal, yet, later, it succeeds it. Is there, in short, no link by which normal and reversed images are united? I think there is.

Are not normal density and halation inter-dependent one upon the other? What is normal density? Wherein does it differ in constitution from the density of halation and the density of reversal?

In so far as we know anything at all of the nature of the invisible and developable image, we know something of the nature of halation. We know, or are satisfied to believe, that both are light-born, grow in the same manner, and consist of the same material. And, if this is so, why draw sharp lines of demarcation between the three forms of deposit? The transition is exquisitely gradual in reality! Seeing that we recognise in halation an excrescence inimical to the "true" image, a parasite preying upon it from a practical point of view, why do we not pursue the idea further, and inquire whether the surplus in one direction does not imply a deficit in another? We are well aware that the blurring, or spreading of the developed deposit is most frequently noticed in the vicinity of those portions of a negative which are most exposed, as, for instance, around flames, near skies, high lights on machinery, and white dresses. Encountered locally under these and similar circumstances, we recognise the presence of "*halation*," and speak about it and write about it as we do of dichroic fog; as something phenomenal and out of place. Yet, even where it is much more extensive, we either utterly fail to see it, or, seeing it, do not recognise it, call it by another name, and take it as a matter of course. In photographing all subjects which exhibit only a small range of contrast—such, for example, as a pencil drawing upon white paper—we find it almost impossible to get our representation of the paper dense enough without getting those parts which stand for the pencilled lines too dense. Parenthetically I may here remark, that it is very doubtful whether, in this case, any negative could be considered "perfect" in which the lines of the drawing were free from fog in the negative.

This may be taken as an extreme type of a host of every-day subjects, with which we cannot readily make sure that we will get the highest light of full printing density without allowing those parts of our negative which stand for the shadows to become too dense, or, in other words, "fogged" or degraded. We invariably attribute the degradation of the shadows produced under these conditions to "over-exposure" or "over-development," believing that our exposure has been sufficiently protracted to admit of the shadows of our subject acting as if they were lights or half-tones, and consequently of being developed.

Now, although this explains why a deposit is present in the shadows, it by no means accounts for the whole of the superfluous degradation, which, in all likelihood, is there. This a very important point, in my estimation, and is one which I particularly wish to emphasise, as, apart from the fact that many will be unwilling to acknowledge its truth, the validity of my deductions regarding the connexion between halation and reversal depends upon the accuracy of my statement; for it is upon this basis that I have founded the line of reasoning which has prompted me to numerous experiments.

I venture to think, however, that I can prove my standpoint on the subject to be well founded by means of one test, which I take to at once crucial and convincing. The proof to which I refer is this, that nearly all, if not all, over-exposed and over-developed negatives, taken in a dark slide which holds the plate in position by means of a rebate along the four sides, will, if they have been exposed upon subjects of a fair degree of contrast, be found to exhibit halation, and that they do so may be ascertained by closely examining that portion of the negative protected by the rebate, more particularly in the neighbourhood of a dense portion of the film. Yet it is under circumstances like the present that the halation around and throughout the representation of the subject-matter is either totally invisible *as halation* or only discernible under the most minute scrutiny. That it is there, however, the protected portion proves.

How seldom is the presence of halation—wide-spread, gradually fading halation—suspected under these conditions. The shadows are almost clear, the high lights are by no means too dense for printing purposes, neither do they appear at first sight to have undergone even the first stage of solarisation. As a matter of fact, however, reversal of the high lights had been initiated long ago. As a matter of fact, also, the halation blends imperceptibly into the "chemical fog" or "light fog" in the deepest shadows. And yet there are those who maintain that the ratio between degrees of density (the same number of degrees on dense and pallid plates alike) is not altered by development, men who are so skilful that they can remove the fog without trenching upon the deepest effective shadows of the subject-representation, and can then measure the densities to $\frac{1}{3505}$ of total density, $\frac{1}{505}$ of their unit density.

HUGH BREBNER.

CONTINENTAL NOTES AND NEWS.

Anthion.—This is a substance which, according to the *Mittheilungen*, has the property of removing the last traces of sodium hyposulphite from a positive print. It is only slightly soluble in water (1 : 100), and exercises an oxidising action. Prints placed in the solution for twenty minutes were found to have remained unaltered after a period of five months. To ascertain whether the anthion solution has really removed all the hypo, a few drops of silver nitrate solution are allowed to fall on the still wet "anthionated" print; if a yellow colouration appears, then there is still hypo left, and the print must be returned to the anthion solution. Anthion is said to be of the nature of sodium bisulphite.

Outing Statistics.—Quite a common feature of photographic society outings is the ascertainment of the number of plates exposed, which is usually done at the tea with which these celebrations invariably conclude. Sometimes the various makes of plates are specified. It has been reserved for the Société d'Excursions des Amateurs de Photographie to go one better than their English *confrères*. At an outing recently held by the Society named eleven gentlemen were present, and not only are the numbers and makes of plates exposed given in the report, but also the cameras and lenses used. Thus the figures read 190 plates, 14 cameras, 24 lenses. Of the latter, there were 9 Dallmeyer, 5 Zeiss, 3 Prazmowsky, 2 Français, 2 Zion, 1 Darlot, 1 Steinheil. What possibilities of statistical innovations these particulars must open up to the 250 odd "able and energetic" honorary secretaries of the 250 odd British photographic societies!

A Colour Photography Competition.—The Société Française de Photographie is organizing a competition in the production of colour photographs by Lippmann's method. Six subjects are specified; views, portraits, an interior, flowers, &c., and the size of plate is also prescribed. The inevitable medals are to be awarded to the successful competitors. The object of the competition, says *Le Moniteur*, is to popularise the Lippmann method, and enrich the Society with the work of its members. We hope both ends will be attained; but, remembering Mr. Fred. Ives's statement, that the half-dozen examples shown in this country a year or so ago were the results of some thousands of trials, we are not very sanguine on the point.

Aluminium a Precipitant for Gold and Silver from their Solutions.—M. Silas, in the *Paris Photographie*, says that aluminium offers an excellent means for recovering gold and silver from waste solutions. The particular solution is first of all made acid with hydrochloric acid, and then a strip of aluminium is introduced. The gold precipitates as a brown powder; the silver is thrown down as chloride.

A Generous Amateur Photographer.—Baron Albert de Rothschild has instituted a fund for the relief of indigent Viennese photographers, himself giving a sum of ten thousand florins (nearly 900*l.*) as a nucleus. The administration of the fund is in the hands of a committee.

A Daguerre Memorial.—Some time ago a subscription for the erection of a monument to Daguerre at Bry-sur-Marne was started in Paris. The enthusiasm for "the father of photography" is so great in la belle France that the sum so far received is insufficient to erect a monument worthy of Daguerre. Consequently the list is to be kept open for a while longer, and we trust success will await that course.

THE PHOTOGRAPHIC NATURALIST.

Floral Photography.

The superiority of the camera for the delineation of natural objects has led to its increasing use as a necessary adjunct to the ordinary equipment of the field naturalist. Field Clubs and Natural History Societies are beginning to rely more and more upon their photographic members to secure permanent and accurate records of those objects of scientific interest which come before their notice. Photographic albums are now a necessary part of every natural history collection: they are increasing every day in size and value, and will be consulted by future generations of naturalists long after the objects which they record shall have changed or passed away.

In spite, however, of this recognition of the value of photographic records, the camera has not yet been brought into systematic use by botanists to the extent which might have been expected. But few botanical books have been illustrated by photography, and but few photographers seem to have realised the value of flower studies either as artistic exercises or as scientific illustrations of botanical facts. It is hoped, therefore, that the following brief outline of what has been, and what may be, done in this department may prove useful, not only to the botanist but also to every photographer who is interested in the development of natural science. In the Paris Exhibition of 1867 there was a diorama of the remarkable plants of the world, reproduced from nature by photography, and in the Museum of the Imperial Institute at the present time there is an interesting and valuable series of photographs of economic plants, illustrating not only their life history but also the processes of preparing the vegetable products for the use of man. In the long interval which has elapsed since the first of these two collections of botanical photographs was prepared, immense strides have been made in the perfection of the photographic art; and, if colour is still absent from floral photographs, we have now the means of securing the next best thing, the correct rendering of colour value. Unfortunately, the modern inventions in hand cameras and instantaneous shutters are absolutely useless in floral photography. It is only by prolonged exposures, with colour screens and ortho-chromatic plates that the best results can be obtained.

Permanent Processes and Natural History Records.—In spite of the short time which has elapsed since the formation of the photographic albums at the Imperial Institute, many of the prints have already turned yellow, and must be speedily renewed or destroyed. It is of the utmost importance that only the most permanent processes should be employed for such purposes, and at the same time it is necessary to give preference to those printing processes which show delicate detail in the greatest perfection. In this connexion it is to be regretted that the exquisite delicacy of detail rendered in gelatino-chloride emulsion prints may not prove available for scientific albums. The whole question of permanency, however, is not yet thoroughly understood. There is in my possession at the present time a collection of photographs made and placed in an album nearly forty years ago. There are about fifty in all, and they include examples of nearly all the printing processes then in vogue. The following table shows their present state of preservation:—

	Well preserved.	Slightly discoloured.	Badly faded.
Albumen prints.. ..	16%	57%	27%
Talbotype	100%		
Calotype..	75%	25%	
Plain salted paper ..	100%		

From the above summary it is evident that albumen prints do not withstand the ravages of time so well as the matt-surface papers. Amongst modern printing processes it is likely that platinotypes will prove far more durable than those in which either gelatine or albumen are concerned, and it would be well for curators and librarians of natural history societies to induce the donors of photographs to pay more attention to this question of permanency, and thus to avoid the production of evanescent records. These are not more valuable for present study than for future reference. It is the tendency of modern conditions of life to extirpate species which have but a limited distribution. Photographs of rare plants, therefore, growing amidst their natural surroundings, will have an exceptional interest in future years, and will, if still existing, give the coming generations of naturalists advantages far surpassing in accuracy and detail the solitary leaf impressions in pipeclay upon which the palæo-botanist of to-day is compelled to rely.

Colour Screens in Floral Photography.—One of the difficulties in photographing flowers and foliage consists in giving sufficient exposure to ensure detail without running the risk of solarisation of the sky and distance. This difficulty is more especially felt where floral studies occupy the foreground of a landscape scene. As early as the year 1856 Crookes and Spiller communicated to the *Philosophical Magazine* a paper suggesting the use of yellow screens for the purpose of checking solarisation when photographing foliage. They also tried the addition of green colouring matter to the plate, using nitrate of nickel and also the double nitrate of ammonia and nickel for this purpose. Orthochromatic photography, however, and the theory of optical sensitisers were then unknown, and Crookes' suggestion failed to attract much attention. Nearly ten years later a writer in the *Times* of April 12, 1865, advocated the same idea. It was pointed out that yellowish green cathedral glass, although it might reduce the *intensity* of the green rays from foliage, would not prevent their transmission, while it would stop a large part of the actinic blue rays, and so enable a better exposure to be given to foliage. In the same year Cary Lea, discussing the advantages of green-glass screens, pointed out the serious loss of reflected white light which this method would entail. It was just this reflected white light from certain glossy leaves, such as the ivy, which rendered these plants exceptionally suitable for photographic reproduction by the older processes. It was never contended in these early days that the use of screens contributed to orthochromatic effect, but simply that the use of suitable screens would enable a better-exposed negative to be secured without solarisation.

The following directions for making colour screens, due to Dr. C. L. Mitchell, are now given for the benefit of those who prefer to prepare their own apparatus:—Take thin plate glass, such as is used for animalculæ tanks for the microscope; cut into small squares of about two and a half inches side, and flow with amyl-acetate collodion coloured with aurine for orange red, or "golden yellow" aniline for lemon yellow. About five grains of the dye to the ounce of fluid will be sufficient. The amyl-acetate collodion may be made by dissolving old celluloid films in amyl acetate, after extracting the camphor with alcohol. Before dissolving, the amyl-acetate should be mixed with an equal quantity of benzine and six times the quantity of a mixture of alcohol and ether in equal parts. The solution of the celluloid takes several days, with frequent shaking. Filter through cotton-wool, add the colouring matter, and coat the glass squares. Be careful to exclude dust while the film is drying, and when dry cement a similar cover glass upon it with clean Canada balsam. When quite dry, bind the edges, as in finishing lantern slides.

Colour screens may either be placed in a hood before the lens, or fastened by any convenient arrangement inside the camera behind the lens. As regards depth of tint, it has been found by Dallmeyer that yellow screens, unless very deep, do not cut off all the violet rays. Burchett suggests the combination of yellow and green screens, which effectually cuts off the violet rays without any very great lengthening of the exposure.

It is safer to focus after the screen has been placed in position, for, if the lens is not rigorously achromatic, there will be a slight difference in the focus of the yellow rays, amounting to one-two-hundredth part of the focal length of the lens. Non-parallelism of the faces of the colour screen would also disturb the focus. The use of the screen with ordinary plates necessitates prolonged exposure in proportion to the depth of colour. Very light screens require at least twice the ordinary exposure, and deeper tints increase it from eight to twenty times. In dull weather failures are very likely to result from under-exposure.

As but little advantage is to be expected from the use of colour screens with undyed plates in the case of isolated studies of floral subjects, we now pass on to the consideration of colour-sensitive films.

J. Vincent Elsden.

COLLODIO-CHLORIDE FOR TRANSPARENCIES.

[London and Provincial Photographic Association.]

In thinking of a subject to give our Hon. Secretary for his list for the year, I remembered some rather promising results which I obtained about thirteen years ago with collodio-chloride by development. This resulted in me giving him the title which heads this paper, and was given with the view of further experiment, and the chance of obtaining some more perfect results than I did at the time I mention. During this thirteen years I had not touched the process, and it appears to have been almost forgotten. So far as I can remember, the development of an image upon chloride of silver was considered

almost impossible previous to the announcement of Dr. Eder, in the early part of 1881. The experiments by Dr. Eder were, I believe, entirely with gelatine. This is very different to collodion, as it restrains the action of the developer, and allows the image to appear before the silver is reduced where no light has acted.

A short time after this, in April 1881, in the *Photographic News*, the late Mr. H. B. Berkeley says, in a letter, "Collodion will not answer at all—I used both soluble bromide and chloride as restrainers." This statement from Mr. Berkeley is enough to prevent any one from touching the process. In the *Photographic News*, Oct. 21, 1881, Captain Abney gives a formula for collodio-chloride. This is the process which I started with at the time I have mentioned. A beer preservative is to be used, and the plates developed with Abney's ferrous-citro-oxalate, or hydroquinone. The colour, Captain Abney says, is ivory black. With this emulsion I could not get beyond a cold grey and a good amount of fog. Abney remarks that the ferrous-citro-oxalate can be used without any restrainer. I tried increasing quantities up to three grains per drachm with same result. I also tried addition of four drops of a twenty-grain solution to the emulsion with no better result. I made several quantities of this emulsion, always with the same result. Captain Abney, remarking upon what is usually called collodio-chloride, says it is "misleading to call it collodio-chloride, as it contains a large proportion of citrate in its composition." This remark is quite applicable at the present time, for I do not suppose that any of the so-called chloride papers or plates are simply chloride.

When I took up the matter again, about three months ago, my experience with Abney's emulsion was the same as described. I expected, by practice with it and variations with other developers to have succeeded, but I was disappointed. I then worked with a process described in THE BRITISH JOURNAL OF PHOTOGRAPHY, November 20, 1891. I may just say that I do not remember hearing anything of the process for the ten years between.

I worked with this for some time, and got fair density and some good colour, but I used ferrous-citro-oxalate, hydroquinone, pyro, amidol, metol, and glycin, in various proportions, and with increasing quantities of bromide. I also tried the addition of quantities of citrate of potash; this seemed to improve matters a bit. The image with the best proportioned developers came up gently enough—but the fog as gently with it. I tried four samples of pyroxyline. I began to feel disheartened, and expected to have nothing but failures to describe to you in this paper. I am pleased to say this is not the case. A week ago this evening, I arranged the following formula, which has proved to be a complete success in my hands:—

Pyroxyline (Hopkins & Williams' ordinary)	32 grains.
Ether (725)	3¼ ounces.
Alcohol (805)	2½ „
Chloride of zinc	40 grains.
Nitrate of silver	92 „

Dissolve the chloride of zinc in the alcohol (and this is a valuable quality of chloride of zinc, that it will dissolve in the alcohol without the addition of water), put in the pyroxyline when soaked, add the ether and shake. Now put the silver into a test tube, add forty minims of distilled water. At this stage I prefer to use a non-actinic light. A single thickness of amber glass will do. There is no necessity for working in a dull light. We now dissolve the silver by heat over a spirit-lamp flame, and at the same time heat six drachms of alcohol in a small flask; when the silver is dissolved, add about a drachm of hot alcohol to it by degrees. Then add to your collodion, a drop or two at the time, and shake well between, rinse out the tube with the remaining alcohol. If the operations have been carried out out properly, a few drops of the emulsion put upon a plate will show an orange tinge, a fairly thick film, a full orange inclined to ruby when held up to a light. The emulsion must be kept for not less than twenty-four hours.

This emulsion may be washed in the ordinary way. I use it without washing as a rule, as washing entails the consumption of twice the quantity of solvents. To filter, place a plug of wool or good sponge in a glass funnel, and run the emulsion through. Moisten sponge or wool with a few drops of alcohol first.

Coat the plates, and place them in a dish of water until the water runs smoothly over the surface, then rinse with two changes of water. Wipe the backs, and drain on blotting-paper; or, when plates are wanted quickly, a piece of blotting-paper may be placed on face of the plates, and gently pass a finger over to absorb all surface water. After this, they dry in five to ten minutes by the use of such a piece of apparatus as I show you. The usual drying cupboard will do of course.

With this emulsion no preservative is at all necessary. I have found no difference in the results. One thing I have forgotten to mention in the proper place, that is, the use of a substratum to prevent the film slipping off the plate during washing. I strongly recommend edging the plates with indiarubber solution. This is quickly done with a small camel's-hair brush cut to about a quarter of an inch long in the hair. A dozen of lantern plates can be done in five minutes easily.

The results which I show you have been developed with Abney's

Ferrous citro-oxalate	1 part.
Ten per cent. bromide potassium solution	1 „

Glycin I have only tried one formula given by the makers, that for hard development; and hydroquinone, as follows:—

Hydroquinone	4 grains.
Bromide potassium	24 „
Sulphite of soda	48 „
Water	1 ounce.

Three minims of a ten per cent. solution of carbonate of soda.

Development was from five to twelve minutes. All these developers may be used repeatedly. Hypo must be used for fixing; two ounces to the pint is strong enough. Washing in the hand for about a minute is enough to remove the fixing salt.

The light used by me was magnesium, 6 to 36 inches. The colours are black, claret, and most beautiful purples to purple black.

And these I must ask you especially to notice are produced by simple development with simple collodio-chloride emulsion.

J. S. TEAPE.

REMARKS ON PHOTOGRAPHIC-COLOUR PRINTING.

[Edinburgh Photographic Society.]

THE subject is a very large one, and it seems to expand as we approach it. Many interesting vistas of thought are opened up for our contemplation, so that I have had great difficulty in reducing my notes to anything like a connected and systematic order, and in resisting the temptation to stray into by-paths and linger by the way.

I shall not detain you to inquire what is art, or to discuss the real *versus* the ideal. How the eye perceives colour, the physiologist must tell. Ethereal vibrations and wave-lengths, the theories of light, and the wonderful phenomena of colour, the physicist must explain. For excellent reasons I cannot to-night refer at length to the optics, the chemistry, or even the techniques of the subject, and we need not go minutely into the history of photographic-colour printing. When all this interesting cargo is heaved overboard, you will be fully entitled to think there cannot be much left to speak of, for I propose in our limited time to treat the matter on very broad lines, and to touch only upon general principles.

I would remind you at the outset that photo-chromatic printing is not colour photography as popularly understood; but the two arts are so closely allied, if the one be not actually a stage towards the other, that I have not been able to separate them in my remarks, so I must ask you to bear with me while I refer to both.

Not being a practical worker in any of the processes myself, I am compelled to present the subject to you from my own point of view and in my own way. I must remember also that I am addressing an audience of those interested in general photography and including expert workers, and I have ventured to occupy the position of a sort of connecting link between the two.

To add to your interest, and to support my own remarks, I have brought a number of illustrations, and if time permits I will show a few simple but very striking experiments more or less directly in line with our subject.

Here I would like to give you a glimpse of a world without colour: the beautiful words of Sir David Brewster, and later on I hope to point you a brief glance of the same in all the reality of demonstration. and the life of Sir Isaac Newton he says:— lending

"If the objects of the material world had been illuminated ellow, and light, all the particles of which possessed the same degree ese prints, bility, and were equally acted upon by the bodies upon whic all nature would have shone with a leaden hue, and all the co v. of the of external objects and all the features of the human counten finest and have exhibited no other variety but that which they possess i st recent sketch, a China ink drawing, or a photographic picture. Th of the itself would have dwindled into a narrow arch of white light, is m st would have shone through a grey sky, and the mantle of a twilight would have replaced the golden vesture of the rising a have setting sun. But He Who has exhibited such matchless skill i ted organization of material bodies, and such exquisite taste in the fo e upon which they are modelled, has superadded that ethereal beau d, which enhances their more permanent qualities, and presents them to ic in the ever-varying colours of the spectrum. Without this the folia eral vegetable life might have filled the eye and fostered the fruit whi have veils, but the youthful green of its spring would have been blended the dying yellow of its autumn.

"Without this the diamond, the ruby, and the sapphire might have displayed to science the nice geometry of their forms, and yielded to the arts their adamantine virtues, but they would never have sparkled in the chaplet of beauty, or adorned the diadem of princes. Without this the human face divine might have expressed all the qualities of the mind, and beamed with all the affections of the heart; but the 'purple light of love' would not have risen on the cheek, nor the hectic flush been the herald of its decay."

We also understand that the completely colour-blind view all nature as a monochrome photograph or as a bromide enlargement. Here is a brief extract from Captain Abney:—

"I have had the good fortune to examine the eyes of two brothers who were colour-blind to all except one sensation of colour, and that was, apparently, a blue sensation, with a maximum of sensibility to the spectrum in the blue-green. If we examine the sensitiveness of a bromo-iodide plate, we find that the sensitiveness is of the same character and position (in the spectrum). These two brothers saw everything in monochrome, and to blind persons of this nature it matters not whether we call it a monochrome in blue and black, or in white and black, since white and blue are synonymous to them, all other colours which make up the white being absent. The photographic plate would see the same objects in the same monochrome, and depict it as such, with a certain amount of falsity in light and shade owing to its inherent defects, but still the images seen by these eyes and by the plate very closely resemble each other."

We often hear regrets expressed that we cannot as yet secure in the camera direct an image that shall represent the object in the exact colours of nature, for the popular impression seems to be that the great discovery may come about by a mere press of the button, the flash of a shutter, or a squeeze of the printing frame. But the more one looks lovingly at Nature in all her changing moods from dawn to sunset, in storm, shadow, and sunshine, the less one seems to desire any mere mechanical or even scientific reproduction of her varied charms; nor could the workers in such a process ever hope to supplant entirely the heaven-born artist, whose trained eye and intuitive skill seizes the fitful impressions as swiftly as any instantaneous shutter. The subtle effects of atmosphere and aqueous vapour one would think could never be caught "*in camera*," the sunset passes on from glory to glory; or, as Mr. Powell observes, "Let us stand on some headland and watch how the sea is affected by every change of sky and cloud, now flecked with white, now flashing with blue and emerald, now purple beneath a heavy cloud, now flashing in the light, or ruddy with the glow of the setting sun, and then ask yourself if it will ever be possible, by any mechanical process, however delicate or subtle, to register and fix the evanescent phases that quiver for a moment on its surface, and then vanish for ever."

Besides, the more we know of photographic chemistry and optics, the more we consider the nature of light and the laws of colour, the further away seems to recede the prospect of ever depicting directly in the camera or the printing frame the varied hues of nature.

And yet, if we have regard to the tend of modern investigation, and if we consider well the *approaches to colour* in photography which have already been made, we appear at the present moment to be engaged upon the survey, as it were, of the coast line of a great continent of discovery. We are officered by eminent men of science, we have a gallant and enthusiastic crew of workers; small parties have travelled inland by the river channels, some others have seen round a rocky headland, and one or two have enjoyed a Pisgah view of the promised land. That is, we are told that the spectrum has been photographed and fixed in all its radiant colours. *Do you believe it?* Iridescence and all the colours of the rainbow have frequently been got by accident, but *to do it over again* is difficult or impossible.

Here is Mr. Brothers' account of M. Lippmann's experiment: "The spectrum was thrown on to the sensitive plate by means of the electric light, and, on development, the colours of the spectrum could be seen by reflected light, the effect being somewhat that of iridescence. I have recently seen one of those photographs, and can testify that it is a very beautiful thing. It might be passed by as a very imperfect production; but a careful examination in a proper light, and viewed at the proper angle, the picture of the spectrum is very beautiful, not perhaps giving the colours in their relative intensities, but all the colours are there, from the deepest red to the faintest violet. M. Lippmann does not claim to have solved the problem of photography in natural colours, but he has successfully photographed the spectrum, and, moreover, the picture is permanent and can be viewed in daylight. It is beyond doubt a great scientific achievement, and adds one more to the wonders effected by photography."

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Looking back upon the history of photography, and never ceasing to marvel at its origin and progress, dare we affirm that there shall NEVER be direct photographs in colours? Our fathers and grandfathers at the beginning of this century might as well have said the sun could never produce a picture. Yet we have the miracle of the Daguerreotype in all its beauty of detail. That was in time followed by methods of reproduction, then rapid reproduction, reaching at the present day indirectly to the rapidity of the steam printing press. And so, by successive steps of advance, we have pigment photography in single colours, collographic and block printing in various tints, photogravure in any shade, and now, by an evolution from these, we have photo-chromatic printing, doubtless to be followed ere long by true colour photography in some form or another.

Like all other advances in science, this most recent art, that of colour printing by means of photography, is the result of the combined efforts of many workers. But I must again borrow the words of Sir David Brewster: "The history of science presents us with no example of an individual mind throwing itself far in advance of its contemporaries. . . . . The achievements of intellectual power, though frequently begun by one mind and completed by another, have ever been the results of united labour. Slow in their growth, they gradually approximate to a more perfect condition. The variety in the objects and the phenomena of nature summons to research a variety of intellectual gifts; observation collects her materials, and patiently plies her humble vocation; experiment, with her quick eye and ready hand, develops new facts; the lofty powers of analysis and combination generalise insulated results and establish physical laws; and, in the ordeal of contending schools and rival inquirers, truth is finally purified from error."

The Approaches to Colour.

Now, although we have only recently been able, by means of photography, to produce composite pictures, in which the various colours are blended into one harmonious whole, still we have not been altogether without colour in the photographs of the past two or three decades, and I have brought with me to-night several familiar examples to show the range of tints we have enjoyed. Even the early calotypes gave a certain range in sepias and bistres. Sir John Herschel's cyanotype discoveries resulted in a striking blue, with modifications into brown and black. The ordinary silver albumen print can be made to yield a considerable variety of tones, such as reds, browns, purples, and blacks. But it was not until the discoveries of Mungo Ponton of this city, and his investigations into the photographic actions of bichromated gelatine, which gave rise to a whole crop of new processes, that the so-called carbon or pigment process gave practically unlimited scope for the production of photographs in any single colour. Closely alied to the carbon process we have others, based on different properties of the bichromated gelatine. I mean those processes which, after the photographic action of light has done its part, are carried on by methods similar to and in close imitation of those of the lithographer, the engraver, the etcher, and the block printer, in which the *cliché* bearing the picture gets a lick of ink to make it do its work on the collographic machine, or the modern steam printing press. It will be clear to you that, by varying the inks upon these *clichés*, we can have any single tint we please.

The Properties of Bichromated Gelatine.

When bichromated gelatine is exposed long enough to daylight, it is rendered insoluble and impervious to water; when in this condition, its surface resists water, but has a great affinity for fatty matters, such as oily inks, and it has become so indurated as to resist very great pressure. Now, it is upon these properties that the processes I have just mentioned are based. In the carbon process an emulsion of gelatine, with a solid pigment held in mechanical suspension, is spread in a thin layer upon paper. It is then floated upon a solution of bichromate to sensitise it, and, when dry, this is exposed to daylight beneath a negative. The light getting through the transparent shadows and half-tones of the negative renders those parts insoluble, and so locks up the solid pigment contained in them; the high lights, or those parts of the picture protected from the light by the dense portions of the negative, are not acted upon, consequently they remain soluble, and are washed away with the pigment they contain upon the application of hot water from the kettle in this simple process of development.

In the collographic printing the picture is printed in precisely the same manner upon bichromated gelatine, but no pigment is required. After washing, a wet sponge is applied, then the picture is inked up with the roller, and the proofs are thrown off as in ordinary lithography. By the kindness of Mr. Balmain, of Messrs. Tunny & Co., I can show you a collographic plate.

In the Woodbury process, advantage is taken of the extreme hardness of the light-struck bichromated gelatine. The developed film consists of heights and hollows representing the lights and shadows of the picture. The film is placed upon soft stereotype metal or tinfoil, and subjected to great pressure in the hydraulic machine. The metal takes a mould of the film, and is inked up like a copper or steel-plate engraving.

In photogravure the *cliché* is laid down upon a copper plate, and the picture etched out with chemicals. [Here a number of pictures were shown in illustration of the processes evolved from the properties of bichromated gelatine, and to show the range of tints obtainable before the advent of polychromatic impressions—examples of the carbon process, the Woodbury process, photogravure, collography, photolithography, and phototypes from zinc blocks, &c.] Messrs. J. Adamson & Son, of Rothsay, have been good enough to send a book of collographic prints of the most varied description and tintings. These specimens show to what perfection this cheap and extremely rapid process has attained in the hands of this well-known firm. Their marine studies are ever before us in the shop windows, and they have many large orders in hand. Twenty thousand copies from one negative can be thrown off in a couple of days by this process.

I would ask you to note that the stage we have reached in colour-pho-

tography, or rather photo-colour printing, is attained by most ingenious combinations and modifications of the processes I have just been referring to, with, however, the addition of other important factors, perhaps the chief of these being the means adopted to arrive at

True Colour Values,

or their light and shade tints as seen by the eye.

Now, before colour photography was ever thought of at all, it was found to be desirable to devise some means to obtain true colour value. To explain what is meant by this, I have only to remind you that the unregenerate photographic plate gives false impressions, tells lies in fact. Can photography err? some people ask. If it does not exactly swear black is white, at least it renders red as black, and blue as white. What would a Princes-street photographer say if a lady with a rich ruddy complexion offered to give him a sitting in a blue dress, with a crimson sash and a yellow scarf! *He* might turn pale at the sight; the lady, but for his retoucher, might be black in the face in her photograph, which would also show a black sash upon a white dress. And so with the yellows, reds, blues, greens, and purples of Nature. Those that we see as light colours come out dark in the photograph, and those that we regard as dark tints are rendered lighter than they really are, upon the old-fashioned and false plate.

Colour.

Here just a very few words upon light and colour, in order to illustrate the principles of photo colour printing and to connect my remarks on the process. Light is a form of energy or force which manifests itself to us as visual brightness, heat, and chemical action. White light is composite, and, when decomposed, yields the gorgeous display of colours known as the spectrum, or in other words, "a' the colours o' the rainbow." Here is a chromo-lithographic chart of it, and I will try to show you the reality by means of the limelight lantern later on. There is a large extension of the spectrum at each end of it, which we cannot see, known as the ultra-violet, which manifests chemical action, and the ultra-red, which manifests heat. No one has seen the invisible red, and few have seen the ultra-violet. I leave that paradox with you. Coloured objects in nature have the power of selecting or absorbing a large portion of the white light they receive, and giving out to us only the coloured fragment they cannot absorb.

Moore's "last rose of summer, left blooming alone," gives out a red reflection only, because all the other colours of the spectrum are absorbed, or, in the words of the poet himself, they "are faded and gone."

Peter Bell's

> "Primrose by the river's brink
> A *yellow* primrose was to him,
> And it was nothing more"

is still strictly correct in the scientific sense of colour.

White is said to exhibit the presence of all colour—black, its absence or absorption. The white driven snow furnishes us with a beautiful illustration of the first, for each icy crystal acting as a prism decomposes the light and gives out its little spectrum, and the many little coloured bands unite to give us a white reflection. If we consider minutely the lilies of the field, we find the same beautiful principle illustrated.

Colour, therefore, shows us the sensitive selective power of the object, and it is very remarkable that, in following up their researches into colour-photography, scientists so closely imitate nature as to employ the colour principles in flowers.

These observations lead me now to refer briefly to

Ortho-chromatic Photography.

which, without originally aiming at the production of coloured pictures, was designed to reduce or overcome the reversals of tints I have just mentioned.

Now, there are at least two methods for arriving approximately, if not actually, at true colour values. The first is by the use of coloured screens alone, and the second is by the preparation of special emulsions, with the addition of suitable sensitisers. And now you can understand that it is by a judicious application of these methods, and by following in the line of the researches of Dr. Vogel, and by employing them in connexion with the bichromate processes of Mungo Ponton and others, that we arrive at the principle of photo-colour printing, as it is practised at the present time.

M. Léon Vidal, of Paris, in an article upon polychromatic impressions, observes "that sufficient attention has not been devoted to the investigation of the best means whereby to isolate the colours from one another, through the aid of photography. This selection is, of course, very difficult, but it is not impossible. We already have the certainty of being able to separate sufficiently clearly the red from the yellow, or selecting the blue and the violet from the yellows, reds, and greens, and this is already something accomplished while waiting for better results. On the other hand, having a knowledge of the absorbent properties of certain colouring matters, there is no reason why we should not arrive at a selection as complete as possible.

"The greatest difficulty to be overcome at the present time consists in the separation of the red from the yellow, when in the reproduction of the red parts of a subject we only want to obtain the reds. It is true that we can obtain the yellows without the reds, which amounts to a complete selection of the two colours considered singly.

"To make it plainer, we will say that we may obtain the reproduction of the yellows of a polychrome subject without the sensitive plate being affected by the reds; but, if, on the contrary, we want to obtain the impression of the reds (on a plate sensitive to red), the yellows also would be produced."

Let me ask your attention while I try to explain how ortho-chromatic photography, although devised for the simple purpose of obtaining true colour values, came to be such a useful factor in colour printing. Ingenious inventors came to see that, if to different photographic plates could be imparted such a selective power as to give a separate negative of each of the primary colours, and to extract or isolate the primaries from any composite tint, in coloured objects, we should then at least be able to try a scheme for reconstruction, and so to arrive at photo-chromatic printing, since we cannot as yet have direct-colour photography. Such negatives would consist of lights and shadows only, and I shall trace their connexion with colour later on.

The coloured screens were at first used with the ordinary collodion and gelatine plates, and might consist of carefully selected tints in optically worked glass. Some tried stained collodion films, others parallel-sided troughs containing vegetable dyes. A coloured source of light also is equal to a coloured screen, as I hope to show you to-night. Nature herself often wears a coloured screen. When the air is heavily charged with aqueous vapour, the low sun shines on the landscape with a ruddy blush, with what we call a watery-looking sky, implying the formation of cloud or the actual precipitation of moisture, we have often a strong yellow or even rich orange light upon the scene, both of these tints completely upsetting all the exposure tables of the well-equipped amateur. The violet is, of course, superabundant in good daylight. Even the green screen is not unknown in nature. The eye sometimes suffers a colour screen in certain troubles, and the crystalline lens can be tinted by certain drugs.

So much for coloured screens. The other, and by far the most effectual, method for giving selective qualities to the plates, is by the preparation of very special emulsions, which are rendered sensitive to particular portions of the spectrum—that is to say, to particular colours only. This selective power is still further increased by the use of certain dyes as sensitisers or absorbents. These are either added to the emulsion, or the sensitive plate itself is immersed in a solution of the dyes. The sensitisers, be it noted, consist of colours. Many of them are aniline derivatives, such as erythrosine, eosine, cyanine, azaline, fluorescine, primuline, &c.; others are the native juices of plants or flowers. I have certainly seen chlorophyll, the colouring matter of green leaves, recommended as a sensitiser. All these colours are what chemists call unstable bodies; they are readily decomposed or changed by the action of light, and some of them possess the curious property of displaying two colours. They are said to be dichroic.

[Here solutions of these dyes or sensitisers were shown in flasks. The striking dichroic property of one of them was shown by holding a candle flame at the back of a large flask of the solution so as to give transmitted light when a yellow golden colour was seen. Then, the candle being drawn, the flask was illuminated with magnesium in front, when the solution had the appearance of a *solid* pigment of bright green colour.]

Orthochromatic photography therefore, enables us to obtain three or more negatives in light and shade, representing, more or less correctly, the true proportions of primary colours in the objects to be photographed. From each of these three negatives we may print a positive upon three collotype plates by means of bichromated gelatine, or transfer the impressions by means of ruled screens to three zinc blocks. We select the colours well, adjust the register exactly, turn on the steam, and roll off the photo-colour prints.

Mr. Donald Scott, of Messrs. M. & T. Scott, has been good enough to lend me for your inspection a most interesting set of photo-colour prints. These show at a glance the analysis as well as the synthesis of a picture produced, with the aid of photography, by the three-colour process. Not only does it show separate impressions of the three primaries, but prints of each possible combination in pairs of colours, and finally the finished picture of three printings.

I feel that my few remarks would have been altogether wanting in point had I not been able to show you these interesting illustrations, and the thanks of the meeting are due to Mr. Scott for his kindness in lending these examples of three-colour printing. [As gas light is so yellow, and degrades the tints, magnesium wire was used to illuminate these prints, and to show up the colours to best advantage.]

By the kindness of the Photochromatic Printing Company, of the Downshire Works, Belfast, I am able to show you some of the finest and richest examples of photo-colour printing yet attained in that most recent branch of fine art. The pictures are faithful reproductions of the coloured originals, and the harmonious blending of the colours is most striking and successful.

This Company has been established about two years, and they have secured patents with the sole right to work their processes in the United Kingdom and the colonies. I feel sure that work like that they have sent for our inspection to-night should at once meet with a large demand, and play an important part in illustration, in decoration, and in artistic advertising. As the firm work secret processes of their own, my general remarks to-night must not be understood to apply to them. I have

merely sketched the broad principles underlying photo-colour printing, and indicated same of the consecutive stages by which it has been attained.

Photo-colour printing has, then, been reached by a circuitous path, and through many intricate stages; like all other advances in photography, it is an evolution from earlier processes, and it is rather curious to note its most direct connexion with the bitumen process of Niépce, that immediately preceding the discovery of the Daguerreotype. The chromo-gelatine process of Mongo Ponton contributed, perhaps, the most important factor in its progress, and Vogel's researches on ortho-chromatic plates, for solution of tints, added almost the finishing touches to the practical production of photo-colour printing.

There are, doubtless, interesting secrets closely held by the firms who work these colour processes, but the greatest of these seems to be *accuracy* in all the laborious details of procedure; for, were all these secrets divulged to-morrow in the *Edinburgh Evening News*, there would be very few indeed who would have the patience and skill to work them, or the courage to embark their capital upon the undertaking.

Let me briefly indicate the serious nature of that undertaking, as I recapitulate the points in photo-colour work.

The object—what is to be photographed in colour? Is it the strutting peacock with his tail spread? is it the maiden of bashful fifteen? or is it the widow of fifty? Let me tell you that none of the three, especially the two ladies, could bloom for six or seven hours in the sitting required for their colour portraits.

Gentlemen, we have here a picture of a stuffed parrot, what M. Leon Vidal calls a "poly-chromatic impression," and we would require to have a stuffed widow af fifty before we could have her colour photograph.

The process is, therefore, at present confined to objects of still life, paintings, articles of manufacture, &c., for the exposure required for the red is so long; and, as the face of nature is ever changing, who would venture to set up his tripod to photograph a sunset in colour? So much for the difficulties and limitations of the object.

The plates must have very special selective qualities for the respective colours. The emulsion and the sensitisers must be delicately adjusted to the work in view. The coloured screens must be prepared with the utmost care, else their selective power will be incomplete. The exposure will present great difficulties from the varying nature of the object, the plates, the sensitisers, and the screens. A faint idea of these difficulties may be gathered from the fact that exposures for the three colours may vary in the proportions, as 1, 60, 400, and these again are subject to the varying conditions I have just mentioned.

Each negative must select the whole of each primary colour from the simple and compound elements of the coloured object, that is to say, as I understand it, that the plate for yellow must select the sum total of all the yellow entering into the composition of greens and oranges.

Needless to say, the lenses must be of the finest procurable, and yield the crisp qualities demanded in all process work. The transfers from each negative must be printed to the proper depth, neither more nor less.

The gelatine is often a source of great annoyance. It must be pure, of the proper hardness, gelatinising power, and solubility. When sensitised, it must be used fresh and dried in a certain manner, to yield a reticulated surface. The colours or pigments must be chosen of the utmost purity, with regard also as to whether their opacity or transparency is to be made use of when they are superposed on the picture.

In the case of block printing still more complications may arise. The zinc or other metal plate must be homogeneous. The etchers must each do their work to a degree. The register of super-position must be exact, and the speed of driving must be regulated in accordance with the production of fine work. If errors or faults creep into any of these operations, the whole of the labour may be lost. This is not "press-the-button" photography.

WILLIAM HUME.

CONCERNING MIRRORS.

[Process Work.]

THE mirror is a piece of apparatus the process operator would very much like to do without, if he could, but unfortunately it is a troublesome thing he must manage to get along with somehow. It is an ancient institution in process work, and in other varieties as old as civilisation itself. We know, at any rate, that mirrors have been in use from a very early period. They were made by the Greeks and Romans from speculum metal—a mixture, or bronze, made of copper, tin, lead, antimony, and arsenic—but glass mirrors date back to the twelfth century. This little historical retrospect leads us to the consideration of a question that is often asked, why we do not refer back to the mirrors of those periods, and use an optical plane of, say, silver, or silver deposited on copper? It has been argued that the initial cost would soon be covered by the cost of constant resilvering of the glass ones now in use.

Apart from the fact that it would be difficult to bring a metallic surface down to an optical plane with a high polish, there is also the fact that polished metals are readily oxidised, and would soon become pitted and out of truth, so that, while the initial expense of the plate would be very much greater than for a glass plane, there would be a constantly recurring expense for regrinding, and the cost in this respect would be much more than the resilvering of a glass mirror. Black glass mirrors, unsilvered, of course, will give a total reflection, but the loss of light is too great to allow of their being used for photographic work, though they are valuable in experiments in the polarisation of light.

We suppose even the veriest tyro in process work knows the reason why mirrors are silvered on the surface, though we have heard of reputable firms having supplied, as optical mirrors, pieces of plate glass silvered on the back. There are some people, too, who are not tyros, yet cling to the idea that a piece of ordinary plate glass silvered on the surface will give just as good a reflection as an optical plane. If they had the opportunity of comparing the results of the two, and were capable of forming an opinion, they would speedily be undeceived. Even the best plate glass is never optically plane, and an irregular surface will disperse certain of the incident rays instead of totally reflecting them.

The polishing of a mirror is equally as important as its planishing. The quantity of light reflected from a mirror is always less than the incident light, and the intensity of reflection increases with the degree of polish. If, for example, a beam of light strikes on a well-polished mirror in a dark room, the eye does not perceive the mirror, but only the spot of light. If, however, the surface is badly polished, or a light powder is sprinkled upon it, the mirror is entirely visible from all parts of the room. A perfectly smooth-polished reflecting surface, if such a thing were possible, would be entirely invisible.

In earlier days, mirrors were made by an amalgam of mercury and tin-foil, and in 1835 Liebig discovered that by heating aldehyde with an ammoniacal solution of nitrate of silver a brilliant deposit could be made. In 1849 Mr. Dayton worked out a formula which, in a modified form, is still in use. The exact way, however, in which the mirrors are prepared for use in the studio appears to be something of a secret. Any way, we all know that there is yet plenty of room for improvement, and any one who can give a formula which will allow of a thicker and more permanent silver deposit will, indeed, be a benefactor to the process world. In the mean time, we would suggest one or two things that tend to prolong the life of a mirror. Put it away carefully wrapped in a piece of velvet, previously warmed, in an air-tight box, each day after use. Never leave it in the mirror-box, as damp, sulphur fumes, &c., are most fatal in their action on it. When proceeding to polish it, carefully warm first, and use a very soft washleather, selected and specially kept for the purpose. Warm this, and make into more or less round shape, presenting an unwrinkled surface. Dip into a little of the finest rouge, previously baked to dryness on the stove, and rub this either on the palm of the hand or on paper. This gets rid of any grit, and one can then rub gently and lightly over the surface of the mirror with a circular movement. A coating of thin plain collodion is a useful protection if skilfully done.

The size of a mirror is a matter which seems to puzzle a good many people. The proportion of 7×4 is accepted as standard, though no one exactly knows the reason why. We believe it was adopted when mirrors came into use for the carbon process, and we think it was a size necessitated by the shape and size of the mirror boxes first constructed. As a matter of fact, it entirely depends how near to the lens the mirror is placed. If the inner edge could be placed on a line parallel with the crown of the front lens, and just outside the circle of the lens, the plate need not be larger than the hypotheneuse, or slope, of a right angle whose base is equal to the diameter of the lens tube. But, as it is desirable, in buying a mirror, that it should be adapted to various lenses, it is best not to cut matters so fine, and 7×4 is a very useful size for all lenses up to about three inches diameter.

We have often urged, and still urge, that the best place for the lens is on the front of the mirror box. There is then no stray light, no dust can get in, and there is less risk of dampness and fumes attacking the surface. A further point to bear in mind is, that a properly constructed mirror box is essential, the angle being exact 45°. We have never yet had a complaint of a Penrose mirror box being faulty in this respect, but we do frequently get the mirror boxes of other makers sent to us to put right.

Our Editorial Table.

ROUND THE WORLD.

London: George Newnes, Limited.

WE have received the first part of what promises to be an interesting series of photographs, illustrative of a journey round the world, starting from London Bridge and returning in due course to Charing Cross *viâ* Yokohama and Chicago, after visiting many countries by the way. The pictures are all of the uniform size of 10×8 inches, and each is accompanied by descriptive text, giving much information well compressed. The pictures in this folio are attractive, embracing such subjects as *London Bridge*, *Dover Harbour*, several views in Paris and Belgium—Brussels, Bruges, Ghent, Antwerp, Dinant, all contributing of their quaint scenery. It was thought, and justly so too, that cheapness had reached its zenith

when American folios containing sixteen pictures of dimensions similar to those before were obtainable for the low charge of sixpence; but in this series, George Newnes & Co. have gone one better, for each part of their *Round the World* folio, while it sells for the nimble sixpence, actually contains twenty-four such prints as we have indicated. They are well printed from phototype blocks on good paper.

Mariona.

Marion & Co., Soho-square, W.

We have seen some very fine photographs printed on the new matt-surface paper prepared by Messrs. Marion & Co., and named by them "Mariona." This firm has afforded us the means of trying this paper for ourselves. It is capable of either being printed full out, or of having the details developed after a partial exposure, either to natural or artificial light. It is easily worked, as will be perceived from a perusal of the following directions:—

Carefully dust both paper and negative, and print as with albumenised papers, slightly darker than required for the finished picture, or for partial development, as instructions below. After printing, wash thoroughly in several changes of water from ten to fifteen minutes.

This paper may be toned with any of the usual baths, but the following are recommended:—

Platinum Toning.

A.—*Stock Solution.*

Potassium chloro-platinite	15 grains.
Water	15 ounces.

B.—*Stock Solution.*

Citric acid	160 grains.
Chloride of sodium	160 ,,
Water	8 ounces.

Take 2 ounces from A and 1 ounce from B, and make up to 1 pint with water. This is sufficient for toning two sheets.

The following bath may also be used for platinum toning:—

A.—*Stock Solution.*

Potassium chloro-platinite	15 grains.
Water	15 ounces.

B.—*Stock Solution.*

Chloride of sodium	160 grains.
Chrome alum (1 per cent. solution)	8 ounces.

Take 2 ounces from A and 1 ounce from B, and make up to 1 pint with water. This is sufficient for toning two sheets. When this bath is used, it is not necessary to wash prints before toning; the alum bath can also be omitted.

Gold Toning.—(Carbonate Bath.)

A.

Stock solution of gold	15 grain tube.
Water	15 ounces.

B.

Sodium carbonate (common washing soda)	30 grains.
Water	15 ounces.

Take 2½ ounces of each A and B, and make up to 1 pint. This should tone about two and a half sheets of paper. To be thoroughly washed in several changes of water, then placed in the fixing bath. Dissolve 3 ounces of hypo in 1 pint of water. Keep the prints moving for at least ten minutes. The final washing must be in running water, or several changes of water, for at least two hours.

Alum Bath.—In warm weather or hot climates, it is advisable to use this bath before toning; strength about 10 per cent., or chrome alum 1 per cent., for ten minutes, prints being again thoroughly washed before toning.

Partial Development.—This method will be found very convenient in dull weather, or even at night, by magnesium or electric light. Print till the image is fairly visible, then immerse, without washing, in a 10 per cent. solution of potassium bromide for four or five minutes. Then, after thoroughly washing for a few minutes, place the print in the following developer, mixed in equal proportions:—

A.

Hydroquinone	80 grains.
Sodium sulphite	320 ,,

Make up to 1 pint with distilled water.

B.

Sodium carbonate	400 grains.
Ammonium carbonate	400 ,,
Ammonium bromide	40 ,,

Make up to 1 pint with distilled water.

Continue the development until all but the faintest details are visible, then immediately wash the print thoroughly in running water, to remove entirely the developer before placing it in the toning bath. All after-treatment will be the same as given above for printed-out prints.

Calendars for 1895.—Useful calendars for 1895, for suspending on the wall, have been received respectively from Percy Lund & Co., and from Arundel & Marshall.

Recently Elected Officers of Societies.

(*Received too late for the* Almanac.)

Amateur Photographic Association of Victoria.—Meets at Royal Society's rooms monthly. Informal meetings held also monthly, fourteen days after ordinary meetings. *Hon. Secretary:* J. H. Harvey, 127, Gipps-street, East Melbourne, Australia.

Bolton Photographic Society.—Place of meeting, 10, Rushton-street, Bolton. *President:* Mr. J. R. Bridson.—*Vice-Presidents:* Messrs. B. H. Abbatt, E. N. Ashworth, W. Banks, J. Boothroyd, R. Harwood, J. P. Haslam, W. Knowles, R. Leigh, and John Taylor.—*Council:* Messrs. J. E. Austwick, W. Collier, T. Davies, W. L. Entwistle, W. Green, A. Harper, Dr. Johnson, J. Leach, and J. S. Roscow.—*Hon. Secretary and Treasurer:* Mr. C. K. Dalton, 50, Higher Bridge-street, Bolton.

Capetown Photographic Club.—Established 1890. Monthly meeting, second Wednesday in the month, in the Y.M.C.A. Hall. Monthly field-day, Saturday following monthly meeting. Annual meeting, second Wednesday in November. *President:* Mr. David Gill, LL.D., F.R.S., &c.—*Vice-President:* Mr. T. W. Cairncross, A.M.I.C.E., M.A.M.C.E., F.I. Inst.—*Council:* Messrs. D. C. Andrew, F. Ayers, A. Gracie, G. N. Lindup, R. T. Pett, F.R.A.S., E. J. Steer, J. R. Wignal, and C. Ray Woods.—*Secretary and Treasurer:* Mr. Andrew James Fuller, 37, Grave-street.—*Judges for Monthly Prints:* Messrs. J. S. Morland, S. B. Barnard, and W. V. Richmond.

Goldsmith's Institute Camera Club.—Established 1893. Place of meeting, Goldsmith's Institute. *President:* Mr. J. W. Penfold.—*Vice-Presidents:* Messrs. Arthur G. Bloxam, F.I.C., J. S. Redmayne, B.A., Arthur J. Wood, B.A., A. L. Spiller, and Miss Griffiths.—*Committee:* Messrs. F. W. Berry, S. Dawson, A. R. Forbes, W. F. Holland, Misses Grimmett and Davison.—*Treasurer:* Mr. J. H. Ridge.—*Secretary:* Mr. H. W. J. Browse, Goldsmith's Institute, New Cross, S.E.

Huntingdon Literary and Scientific Association.—A "Photographic Section" has been added to this Institute, where meetings will be held. *President:* M. J. A. Fielden.—*Vice-Presidents:* Dr. Morgan, and Mr. E. Borissow.—*Secretary:* Mr. F. B. Thackray, St. Andrew's House, Huntingdon.

Nelson Camera Club.—Established 1888. Place of meeting, Hardy-street, Nelson, New Zealand. *President:* Mr. Charles Y. Fell.—*Committee:* Messrs. A. Pitt, A. J. Glasgow, H. Brusewitz, and R. B. Jackson.—*Secretary and Treasurer:* Mr. Arthur H. Patterson, Hardy-street, Nelson.

Port Elizabeth Amateur Photographic Society.—The ordinary meetings of the Society take place on the first and third Tuesday in each month at eight p.m. *President:* Mr. A. Walsh.—*Chairman:* Mr. W. Alcock.—*Vice-Chairman:* Mr. T. Stokes.—*Committee:* Messrs. F. West, W. Newbold, J. Lewis and R. Allen.—*Treasurer:* Mr. M. W. Jackson.—*Hon. Secretary:* Mr. W. A. Brown.

St. Helens and District Photographic Society.—Established 1894. Headquarters, Wolverhampton House, Church-street. Informal meetings are held every Monday, and a special general meeting once a month. *President:* Rev. J. W. Willink.—*Vice-Presidents:* Colonel Gamble, C.B., Messrs. D. McKeehuie, J.P., F. R. Dixon-Nuttall, R. G. Brook, and W. Thomason.—*Council:* Messrs. J. Critchley, J. Cammack, L. West, J. Westworth, G. Moon, D. Thomason, and C. H. Jolliffe.—*Hon. Secretary and Treasurer:* Mr. J. C. Nicol, 28, Hamer-street, St. Helens.

News and Notes

Edinburgh Photographic Society.—A Musical and Dramatic Entertainment will take place in Queen-street Hall, on Thursday, January 31, at 8 p.m., in aid of the funds of the Society.

Photographic Club Children's Entertainment.—The date of the Children's Entertainment has been fixed for Tuesday, January 15, instead of Wednesday, as in the syllabus. Special invitation tickets for the children will be forwarded to those members applying for them not later than Friday, January 11. The number, however, is limited, and early application is requested to prevent disappointment. Parents or friends in charge of children will not require tickets. The entertainment will commence at seven o'clock, and terminate about forty-five minutes past nine. In consequence of the Children's Entertainment being altered to January 15, the Club will meet on the 16th, with members' Open Night, as usual. The items arranged for February 6 and 13 have been transposed. The Open Night will be on February 6, and the Ladies' Night on February 13.

EXHIBITION AT BOURNEMOUTH.—The Bournemouth Art Society and the Bournemouth Photographic Society will hold an Exhibition of Paintings, Photographs, Works of Art, and Photographic Apparatus, in the Shaftesbury Hall on Wednesday, Thursday, and Friday, February 6, 7, and 8, 1895, from 11 a.m. to 10 p.m. daily. The opening ceremony will take place on Wednesday, February 6, the chair being occupied by His Worship the Mayor of Bournemouth, Merton Russell Cotes, Esq., F.R.G.S. During the Exhibition lantern slides will be shown, musical entertainments will be given, and a *conversazione* held. Prizes will be given in the Art Section, and gold, silver, and bronze medals in the Photographic Section. Medals for photographic exhibits:—One gold, three silver, and six bronze medals will be offered for competition in the following classes: Open only to members of the Bournemouth Photographic Society—Landscapes, Seascapes, and Architecture, one bronze medal; Portraiture, one bronze medal; Enlargements (accompanied by print of original negative), one bronze medal; Hand camera and Instantaneous Pictures, one bronze medal; Beginners (those having commenced photography in 1894), one bronze medal; Lantern Slides (set of six at least), one bronze medal. Open to any one, amateur or professional—Any Subject, one gold medal; Any Subject, one silver medal; Portraiture, one silver medal; Enlargements (accompanied by print from original negative), one silver medal. The Hon. Secretary of the Photographic Section is Mr. E. Greenleaves, Priory Mansions, Bath-road, Bournemouth.

RECENT PATENTS.

APPLICATION FOR PATENT.

No. 25,305.—"New or Improved Device applicable for Use with Photographic Cameras." M. WHITE and H. KENYON.—*Dated January*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
14	Camera Club	
14	Lantern Society	
14	Norfolk and Norwich	
14	North Middlesex	
14	Putney	
14	Richmond	*Printing and Enlarging on Bromide Paper.* Mr. Davis and Mr. Ardaseer.
15	Birmingham Photo. Society	
15	Brixton and Clapham	*Some Forgotten Pages in Photographic History.* W. H. Harrison.
15	Derby	
15	Exeter	
15	Gospel Oak	Development (Practical Demonstration).
15	Hackney	*Toning Baths: their Good and Bad Qualities.* E. J. Wall.
15	Hastings and St. Leonards	
15	Keighley and District	
15	North London	
15	Paisley	
15	Photographic Club	Children's Entertainment.
15	Rochester	
16	Brechin	
16	Bury	
16	Croydon Camera Club	*Clouds in Prints and Slides.* Hector Maclean, J. Packham, and H. E. Holland.
16	Leytonstone	
16	Manchester Camera Club	
16	Photographic Club	Members' Open Night.
16	Southport	*Photographic Optics.* D E. Benson.
16	Southsea	
17	Birmingham Photo. Society	
17	Camera Club	*A Photograph considered Evolutionarily.* Capt. W. de W. Abney, C.B, F.R.S.
17	Ealing	*Retouching and Composition from an Artist's Point of View.* A. T. Fairs.
17	Glossop Dale	
17	Greenock	
17	Hull	
17	Leigh	*Chemistry of Photography.* W. Hampson, Ph C., M.P.S.
17	Liverpool Amateur	The President will exhibit a Collection of Lantern Slides of Pictures taken by himself.
17	London and Provincial	*The Hand Camera: Then and Now.* W. D. Welford.
17	Oldham	
17	Oxford Photo. Society	
17	West London	Discussion on Record.
17	Woodford	*The Beginner's Difficulties, and How he can be Helped.* F. Elliott.
18	Cardiff	
18	Croydon Microscopical	Trial Night for Members' Slides.
18	Holborn	
18	Leamington	
18	Maidstone	
18	North Kent	
19	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

JANUARY 8,—Ordinary Meeting,—Mr. William England in the chair.

Thirty-one new members were elected, and the nomination papers of several candidates were read.

Mr. J. STERRY read a paper on *Standard Plates and Some Causes of Apparent Alterations in Rapidity.* He credited Mr. Cowan with the idea of employing a standard plate, which he had used as a check on the standard of light. As to the alterations of rapidity which a plate underwent, he said that in the change the variation was found not to follow any settled rule. For example, he spoke of a plate two years old, which had been found to be decreased in rapidity twenty-six per cent.; deducting the original fog, however, it was only nine per cent. less. Age, therefore, was equivalent to an exposure to light. The above result did not confirm the theory that plates increased in rapidity by keeping. Mr. Sterry then dealt exhaustively with the influence of moisture on the sensitiveness and other properties of plates, moistening before and after exposure, the action of reversal, exposure through the back, &c., detailing the results of a large number of experiments, and illustrating the effects obtained by means of diagrammatic lantern slides.

Owing to the length and nature of the paper, it was decided to adjourn the discussion until the members had an opportunity of seeing it in print. A short conversation, however, took place, in which Messrs. Warnerke, Debenham, and Cowan took part, the latter gentleman observing that a standard plate was of great value. Even if a perfect standard light came out, he would never give up the use of a standard plate.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 3,—Mr. G. W. Austin in the chair.

Mr. ATKINS announced the death of Mr. Hirst, a member of the Association.

Mr. A. J. Brown showed an early photographically illustrated book (published in 1863). It was entitled *The Wye* and the photographs were by Messrs. Sedgfield & Bedford, and they appeared to be much faded.

The HON. SECRETARY stated that he had received a paper from Mr. W. K. Burton on *Photo-mechanical Work in Japan.* This would be read at the meeting on Thursday, January 31.

COLLODIO-CHLORIDE FOR TRANSPARENCIES.

Mr. J. S. TEAPE read a paper on this subject [see page 24]. He showed a number of transparencies prepared according to the method described, which were much admired for their range and beauty of tone.

The drying arrangement referred to in the paper consisted of a zinc case, to which boiling water is admitted. By means of two slots at the side, a rack is enabled to be erected, against which the plates are stood upright. In a brief discussion which followed the reading of the paper,

Mr. P. EVERITT said the process would be a very valuable one if regular results could be obtained. He would say that collodio-chloride would be more likely to be of a plastic nature with regard to tone than collodio-bromide, if even results without fog could be obtained.

In reply to questions,

Mr. TEAPE said he had kept some of the coated plates three days after washing. The dish he employed for washing purposes allowed of the egress of the water from the bottom. He used the ordinary cotton sold by Hopkin & Williams, and no better results were obtainable with the high temperature. In his experiments he had also employed the chlorides of calcium, potassium, and cadmium. He attributed his success entirely to the use of chloride of zinc.

Mr. L. MEDLAND, in reference to the indiarubber substratum, said that, of the two solvents of the rubber, coal tar benzole and petroleum benzole, he was successful with the former.

In answer to Mr. Debenham, Mr. TEAPE said that he had found no difference in the results from keeping the emulsion for a day or so. Twenty-four hours appeared to be the time in which it ripened.

Mr. R. CHILD BAYLEY inquired if Mr. Teape did not think that his success had something to do with the acidity of the zinc chloride or the alkalinity of the zinc nitrate formed?

Mr. TEAPE said that the zinc chloride was generally acid. He would ascertain whether an emulsion itself was acid.

In reply to other questions,

Mr. TEAPE said that to several of his experimental emulsions he had added nitric acid, but did not find that it made any difference. He had also added aqua regia, which made the emulsion better, but did not give a clear image. He added the acid after the emulsion was made.

A cordial vote of thanks was passed to Mr. Teape for his paper.

PHOTOGRAPHIC CLUB.

JANUARY 2,—Mr. R. P. Drage in the chair.

Mr. Snowden Ward showed a number of half-tone prints, both landscape and portrait, made by the process about to be demonstrated by Mr. Calmels. It was the opinion of the meeting that they were about the finest half-tones that had been seen in this country.

Mr. Wilmer showed a print from a photogravure plate both before and after steel facing.

Mr. CALMELS then proceeded with his demonstration of half-tone etching on copper. He first showed a Levy diamond-ruled screen. Replying to a question from Mr. Child Bayley, he said the exposure would be three or more times longer with the screen than without.

Replying to another question, he said he invariably used *f*-16 of the conjugate focus. He then showed negatives, one suitable for etching in one bath, and the other for fine etching. Formula:—

Water	2 ounces.
Bichromate of potash	30 grains.
Albumen	7 or 8 drachms.
Fish glue (Lepage's)	1 ounce.

To be put in a strong glass bottle with some broken glass, then to be filtered. Immediately after washing the copper plate it is fixed on a pneumatic holder

fixed to a whirler. The plate is then coated twice, and whirled slowly to get an even surface. After exposure, the plate has to be dyed (aniline violet was used) in order to watch the process of developing. Afterwards the plate is warmed to carbonise the fish glue. After heating sufficiently, the plate is laid on some non-conducting surface. The plate is then etched in a solution of perchloride of iron.

Replying to a question from Mr. Fry, Mr. CALMELS said that a plate could be taken from the etching fluid, washed, and a proof taken, and, if not sufficiently etched, would be returned to the fluid.

Replying to another question from Mr. Fry, Mr. CALMELS said that he did not think that a dry plate gave such a good negative as a wet plate for the present purpose.

Mr. SNOWDEN WARD said that he knew of three or four commercial houses who had given up the wet-plate process for the dry.

Croydon Camera Club.—The first meeting of the new year, held on Wednesday, January 2, resulted in a good attendance to view members' slides thrown on the screen by Mr. Isaac, in order that a selection should be made for the great lantern show to be held at the end of the month. Amongst the slides approved were sets of football play (West Croydon *versus* Scots Guards), scenes from circus life, wild beasts in exile, &c., by Messrs. Maclean, Hirst, Wratten, Smith, J. Noaks, J. Noaks, jun., and G. Corden. As indication of the proficiency attained by some members, it was stated that the world-known lens-makers, Messrs. Dallmeyer, had purchased a lantern slide by Mr. Corden to publish as an example of what their lenses could accomplish; similarly Messrs. Perken, Son, & Rayment have acquired a series of four of Mr. J. Smith's Croydon Fair scenes (shown last month at the Braithwaite Hall), to illustrate the capabilities of the Optimus lenses, with one of which the foregoing was taken.

Ealing Photographic Society.—January 3.—The usual monthly Lantern Evening was held in the Victoria Hall. Two new members were elected. The minutes of the previous meeting were read and confirmed. Mr. T. Simpson manipulated the lantern. A series of slides by the Manchester Camera Club, kindly lent by the Royal Photographic Society, were shown, one of these, a view of the Mersey Bar, being probably the best slide which has yet been seen in Ealing. A number of slides by Mr. W. Richardson were shown, the colour of some being very effective, and a few by the Hon. Secretary. Owing to the very inclement state of the weather, the attendance was small.

Bournemouth Photographic Society.—January 2.—Mr. WILLIAM TYLAR, of Birmingham, gave a lecture and demonstration on *Lantern-slide Making* with the Hill-Norris collodion lantern plates, before a good muster of members of this Society, at their rooms, Athenæum Chambers. The lecturer commenced by describing the attempts of early workers in the infancy of photography to obtain results on collodion plates, and compared the results now attainable with those at the commencement of the present century. Two lantern plates were afterwards exposed to a gas flame for four and two seconds respectively, and then were developed, and afterwards fixed in a solution of cyanide of potassium and dried, each taking only about five minutes in the various manipulations; they were then passed through a limelight lantern and thrown upon a screen, the result being that an excellent enlargement was obtained. The ease and dispatch with which these plates can be worked should be a high recommendation to the rapid worker in photography. A number of slides to compare the results of gelatine plates *versus* collodion were then exhibited on the screen, some of which were much admired, the technical qualities being very fine. A vote of thanks to Mr. Tylar for his interesting demonstration was unanimously carried. On Thursday evening Mr. TYLAR gave a public lecture at the Havergal Hall, entitled *Twenty Thousand Miles in the Far West*, and which was illustrated with 140 slides, a select and appreciative audience being present.

Leicester and Leicestershire Photographic Society.—At the last meeting for the year of the above Society, Mr. GEORGE BANKART (Past-President) gave a most useful demonstration on the *Carbon Process*, and as he is an acknowledged exponent of this branch of the art, and his outfit for the development of the tissue being of the most perfect nature, the demonstration was most successful, and thoroughly enjoyed by a large attendance of members. He showed the process *ab initio*, from the use of the actinometer down to the finished print, and the development of the previously exposed tissues was carried forward without a hitch. His success has given quite a stimulus in carbon work to the members, and several have produced excellent results from the evening's teaching. The Society is to be congratulated on having such a proficient master of the various branches of the art among them, and one who is always so ready to assist the younger members.

FORTHCOMING EXHIBITIONS.

1895.

February 6–8 ..... Bournemouth Photographic Society. Hon. Secretary, E. Greenleaves, Priory Mansions, Bath-road, Bournemouth.

March 25–30 ..... Brixton and Clapham Camera Club.

Correspondence.

WARMING LANTERN SLIDES FOR EXHIBITION.

To the EDITOR.

SIR,—In your LANTERN RECORD of last week (page 5), Mr. G. R. Baker recommends a method of preventing the "steaming" of lantern slides when taken into a warm room. A simpler contrivance, and a very satisfactory one, is to have a portion of the bottom of the slide box made to draw out, leaving a support of about quarter of an inch on either side to prevent the slides falling through. Thus, with an ordinary grooved slide box, the lid and bottom are drawn out, and the box placed on its side in front of a fire to warm, or upright on the hob, or held over a gas flame. I paid ninepence per box to the local joiner for the alteration.

Mr. Beard was credited with this device in the LANTERN RECORD some months ago, but mine were made twelve months before that.

Like Richard, "I give this to the world!" Unlike him, I can claim no merit for so doing, as, after Mr. Beard's prior publication, I cannot do anything else.—I am, yours, &c., W. R. BLAND.

Duffield, Derby.

LEICESTER AND LEICESTERSHIRE PHOTOGRAPHIC SOCIETY.

To the EDITOR.

SIR,—I shall feel obliged if you will kindly allow me to notify through your columns that the above Society are about to hold a two days Exhibition in the Co-operative Hall in this town on Wednesday and Thursday, February 13 and 14; and, as all societies are rendered more useful by the assistance of other societies, we shall feel quite indebted if the members of other societies will forward specimens of their work for exhibition.

We are not sufficiently rich to be able to offer medals outside our Society, but we shall be very pleased to recognise merit in exhibits sent us from other towns in various ways.

Our last Exhibition in the same Hall in March, 1893, was exceedingly successful, and we intend to lose no opportunity of making the forthcoming one still more so. Hoping to have your kind assistance in this matter,—I am, yours, &c., H. PICKERING, *Hon. Secretary.*

High Cross-street, Leicester, January 4, 1895.

PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—Permit me to call your attention to the enclosed circular letters, &c., which has been posted to members of our Union, and I would thank you if you could find room for their insertion in next issue of your valuable JOURNAL. Thanking you in anticipation for this and past favours,—I am, yours, &c., HENRY GOWER, *Secretary.*

Botolph House, Eastcheap, London, E.C., January 5, 1895.

[Copy.]

PHOTOGRAPHIC SECTION PHOTOGRAPHERS' COPYRIGHT UNION.

Committee.—Frank Bishop (Marion & Co.), Chairman; Wm. Downey (W. & D. Downey, Ebury-street); Alfred Ellis (Upper Baker-street); J. Lillie Mitchell (London Stereoscopic Company, Limited); E. Frith (Frith & Co., Reigate); Joseph J. Elliott (Elliott & Fry, Baker-street); Wm. Grove (Window & Grove, Baker-street); Jas. Lafayette (Dublin); Lewis Wilson (G. W. Wilson & Co., Ltd., Aberdeen).

Solicitors.—Messrs. Neish, Howell & Macfarlane, 66 Watling-street, London, E.C.

Secretary.—Henry Gower, Photographic Section, London Chamber of Commerce, Botolph House, Eastcheap, London, E.C.

DEAR SIR,—With reference to my circular letter of November last with copy of rules, I shall be glad, if not already forwarded, to have your decision and subscription per return, in order that the committee may start on their new duties as an organized society with the beginning of the new year.

The accompanying report of the Union's solicitor upon the recent case Ellis v. Ogden, Smale & Co., Limited, pointing out the true bearing of the action as far as members are interested, still further emphasises the necessity of every photographer becoming a member of our Union.

It may be well to note that the subscription covers fees of membership to the end of the year.—I am, dear sir, yours truly,

HENRY GOWER, *Secretary.*

Botolph House, Eastcheap, London, E.C., January 1, 1895.

[Copy of letter from the Union's Solicitor on the recent case Ellis v. Ogden, Smale, & Co., Limited.]

The Secretary, "Photographers' Copyright Union."

DEAR SIR,—At the suggestion of one or two members of your committee, I write a few lines to express my opinion as to the recent case brought by Mr. Alfred Ellis against the proprietors of the *Ludgate Monthly Magazine.*

It is known to you that I was not personally engaged in that case, but Mr. Ellis has kindly shown me the shorthand notes of the proceedings.

I do not consider that the decision of Mr. Justice Collins in any way affects injuriously photographers' copyright in their work.

The case was decided purely upon a question of fact, and not upon any question of law, the question of fact being whether the two sitters concerned gave a commission and paid for the sittings and subsequent copies. In fact, a distinction was clearly drawn between the sittings in plain clothes and the sittings in costume, as to the latter of which no question appears to have been raised that they were Mr. Ellis's copyright.

This question of fact was decided adversely to Mr. Ellis, but the question of law, as I have said, was not touched upon, and I consider it to be as sound law now, as it was before Mr. Ellis's case was decided, that the copyright in photographs taken for publication without payment or promise of payment belongs

to the photographer. I may add, that I think it is in every case desirable that copies, however few in number, should be given gratuitously, in the first instance, to the sitter, and that, of course, no entry should be made in the photographers' books debiting the sitter with any fee in respect of the sitting or first copies supplied.—Yours faithfully, (Signed) BULMER HOWELL.

66 *Watling-street, London, E.C., December* 14, 1894.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatu in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Would exchange moon accessory for lady's or baby's chair.—Photograph to W. H. HORLINGTON, Croft-terrace, South Shields.

Ross' S.A. doublet, 8½×6½, splendid instrument for copying, covers 10×8 easily; wanted, in exchange, wide-angle lens, 8½×6½, by good maker. Address, F. T. BEESON, 21, Agamemnon-road, West Hampstead.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

"EDINBURGH READER."—Apply to Stationers' Hall, London, E.C.

ACME.—Any of the large dealers will supply the necessary lenses and appliances.

B. M. JENKIN.—For general information you cannot do better than get Burton's book on *Printing Processes*, published by Marion & Co.

S. & Co.—So far as we know, the firm named have no agent in this country. Communicate with it direct for the desired information.

CHAS. L. HETT.—We are reserving your letter with a view to an article on the topics mentioned, which will be ready in a few weeks.

C. E. (Southport).—Respecting certain queries received from you some time since, kindly send name and address, and you will be written to privately.

J. S. T.—More than one firm supply the articles, and we do not know to which you refer. Consult the advertisements in the ALMANAC; you will, doubtless, find it there.

S. OKELL.—Your case is very plainly stated, but we can give little aid. See an article in the JOURNAL of over a month ago on flattening the field by means of a plano-concave corrector.

OTHELLO.—With two lenses such as you describe it will not be possible to obtain a flat field unless by using an almost pin-hole stop. You may try the effect of separation, but this will not flatten the field to any great extent.

G. BARKER.—The prints are creditable, considering you make your own tissue The fault complained of will be overcome by the employment of another sample of gelatine. Try also the effect of adding a little ammonia in sensitising.

AMATEUR BROMIDE.—No such work is published. The colours employed are the ordinary water colours as used by artists. Newman's work on colouring photographs will, however, give you some information. Better get a few practical lessons from some one who is proficient in that class of work.

WALTER says: "Would you please inform me where I could find full instructions for making process blocks?"—The ALMANAC for 1893 outlines the principal photo-mechanical processes Full working instructions could only be obtained from some commercial firm; to one of such we recommend you to apply.

WINTER.—Hand-camera pictures of snow scenes are quite a "possibility in a fairly good light." Use quick plates, set the shutter moderately slow, and use a tolerably large stop. With snow scenes a larger aperture can be used than for most subjects, as extreme definition is not of such paramount importance with them.

E. COULSON.—Ask for a periscopic lens of long focus—say, fifty inches or upwards—and have an aperture cut into the mount in which to insert it as you would a Waterhouse diaphragm, having previously had it set in metal. Insert it as near the centre as convenient in front of the diaphragm, convex side out. It may be considerably smaller in diameter compared to the others.

J. P.—It is impossible to say from merely seeing the prints what is the cause of the fading and the spots. It may be the mounts, the mountant, or the manipulation. We may say, however, that we should consider seventeen hours' soaking in water very conducive to fading; also that the fixing bath employed is considerably weaker than is generally used with fifteen minutes' immersion.

H. RENDELL.—1. Your Wray's five-and a-half-inch rapid rectilinear must have its lenses placed close together in order to make it pack into the camera. If you shorten the mount as suggested, the perfect adjustment of the objective will be destroyed, and the field will become round, necessitating the employment of a smaller diaphragm to get marginal definition, which, for use in a hand camera, is objectionable. 2. The dark slide mentioned is said to be quite reliable.

B. B. M.—We are not aware that any of those Continental firms that send the finest photogravure work profess that the plates receive no hand work from the engraver. Some, of course, are less worked upon than others. Photogravures are intended to be classed as engravings rather than as photographs. They are mostly reproductions of paintings, and are intended to compete, as such, with engravings.

NERVOUS TUTOR.—We strongly suspect that you have been misinformed. We have never heard that the oxygen companies refuse to charge the cylinders with less gas than they are constructed to hold. We question if they would demur to putting ten or fifteen feet of oxygen in a twenty-foot cylinder. Why not write to them direct on the subject? Have the four-inch condenser and the portrait combination.

PROCESS says: "Yesterday, on commencing to polish a reversing mirror, as soon as the leather pad touched the surface, the silver wiped off. I have polished the mirror many times before, but never had a similar experience. What could be the reason?" Probably the silvered surface was damp from condensed moisture. At this season of the year silvered mirrors should always be slightly warmed before they are repolished.

H. HARRIS.—It is quite outside our province to say "why such high prices are charged for the new lenses as to make them beyond the means of any but wealthy photographers." It must be borne in mind that the majority of them contain a larger number of glasses than lenses of the ordinary doublet type. That by itself will account for some of the "high price." The glass used in them is also a factor in the cost of production.

T. BOWERS.—A bi-lens camera is the best for stereoscopic work. But equally as good stereoscopic results can be obtained with a single-lens one and the shifting arrangement. Of course, with the latter, pictures of moving objects are out of the question. If the lenses are obtained from a good optician, reliance may be placed on their being accurately paired. The class of negative that will yield vigorous silver prints will also answer for first-class transparencies.

R. J. MORLEY says: "I have made up some varnish according to the formula, No. 6, on page 847 of the ALMANAC, and it is not clear. It was not clear when I added the whiting, and has not cleared since."—It is not surprising that the varnish was not clear at first, as shellac is not wholly soluble in alcohol. The addition of the whiting is to facilitate the subsidence of the insoluble matter. In cold weather it sometimes subsides very slowly, but it may be hastened by keeping the solution in a warm place, or the varnish may be filtered.

G. P. O. asks: "Would you please tell me how negatives are made for postage-stamp photographs, from *cartes-de-visite* or cabinets? The usual gem outfits are no use, as, owing to the camera having to be held close to the photograph, if one of the reproductions is in focus, the others are out of it altogether. They do fairly well for taking from life, but even then it is difficult to get all the heads sharply focussed."—Copy with one lens, and use a repeating-back camera with as many shifts as it is desired to obtain negatives on the plate.

GROUP says: "I had occasion to photograph a large group last Saturday, about two p.m., in one of our furnace sheds here. The exposures given were twenty, twenty-five, and thirty seconds, with a Dallmeyer lens and Paget 50*s*. The first negative is fairly good, but there are a good many movements. The second negative is much better, but some of the people that are steady in the first have moved in the second, and *vice versâ*. I would like to combine the two negatives to get a good print, and would consider it a great favour if you could assist me."—Our correspondent will find an article devoted to the subject on another page.

GROUP MAKER writes: "I propose to make a mosaic group portrait of about twenty-four figures. I intend to take head and bust viguette, cabinet size them, and put behind a cut mount (assorted openings and plain bevels), putting a title at foot and individual names under each opening in black ink. The mount I was thinking to make same tint as enclosed. Do you think that tint the best one?—I mean so as to give a good background to portraits, as I should like them to stand out well, and the names and title to be easily read."—The tint will answer very well, but a thinner board would, perhaps, be a slight improvement, as then the bevel will not appear too deep in the copy.

*** Several answers to correspondents unavoidably held over.

CONTENTS.

	Page
LENS MOUNTS IN ALUMINIUM	17
COMBINING NEGATIVES	18
DEVELOPING GELATINE NEGATIVES OF LINE SUBJECTS	18
JOTTINGS. By COSMOS	21
FROM SUNSHINE TO SHADOW AND BACK. By HUGH BREBNER	22
CONTINENTAL NOTES AND NEWS	23
THE PHOTOGRAPHIC NATURALIST. By J. VINCENT ELSDEN	24
COLLODIO-CHLORIDE FOR TRANSPARENCIES. By J. S. TEAPE	24
REMARKS ON PHOTOGRAPHIC COLOUR PRINTING. By WILLIAM HUME	25
CONCERNING MIRRORS	28
OUR EDITORIAL TABLE	28
RECENTLY ELECTED OFFICERS OF SOCIETIES	29
NEWS AND NOTES	29
RECENT PATENT	30
MEETINGS OF SOCIETIES	30
FORTHCOMING EXHIBITIONS	31
CORRESPONDENCE	31
EXCHANGE COLUMN	32
ANSWERS TO CORRESPONDENTS	32

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1811. Vol. XLII.—JANUARY 18, 1895.

CONCERNING JENA GLASS FOR LENSES.

An optical friend takes us to task, in a friendly way, for having stated, in our article on triple lenses (page 737 of our last volume), that the latest of these—that by Mr. Dennis Taylor—was of English inception, and was constructed of English glass. That this could not be possible, it is averred we might have known from a consideration of the refractive index of the glass as stated in our article. The special kind of glass here alluded to is, of course, the baryta glass, which forms an element in the construction of the centre lens of the combination, and this, it is stated, cannot be made by any of our English optical glass-makers, being made only in Jena.

Now, in the first place, in making the statement alluded to as to the nationality of the glass, we did no more than give currency to what we may consider an authoritative statement made by or for the gentleman who brought his lens before the notice of the members of the Royal Photographic Society, as will be seen on reading the report of the transactions on that occasion, and therefore we are in no wise responsible. We assume statements authoritatively made to be correct.

But is it the case that baryta glass—the peculiarity of which is high refraction with low dispersion—cannot be made in England? That the Jena makers can do it no doubt whatever can be entertained, seeing that they do make it. They do so, it is stated, in virtue of some secret method adopted by them, and them only. Let us look into this. It is, we think, evident that professional glass-makers in England must take a back seat in this matter, and yield the palm to Jena. But may not a discovery have been also made by an Englishman, working experimentally as an amateur? We think that the evidence now to be adduced will lend very strong colour to our hypothesis.

In our volume for 1888, and on page 766, an amateur, Mr. Alfred Dawson, describes how he made several kinds of optical glass, in course of a search to get one that would get rid of the secondary spectrum given by the object-glass of his astronomical telescope. He does not give a fully detailed account of his *modus operandi* in making these various glasses, although he indicates the method adopted. In putting on record what he discovered in certain new kinds of glass which he made, he says that the mixtures of silica were got by precipitation of silicate of soda and the various salts, nitrate of strontia, baryta, &c. The resulting precipitate was well squeezed, then dried and melted.

The glasses which he produced were as follows:—1, silicate of alumina; 2, silicate of magnesia; 3, silicate of strontia; 4, silicate of baryta; 5, silicate of lime. Mr. Dawson, after reciting the optical properties of these glasses, says of silicate of baryta ("baryta glass"), that it is easily made and a wonder among glasses; it refracts highly—as high, indeed, as light flint—and disperses very little, as low as the dispersion of rock crystal, very nearly; so low is it in dispersion that crown glass will easily play the part of a flint to it, and in a subsequent article the week following (page 775, same volume) he describes the furnace requisite for making glass of the kind mentioned, and, after again speaking of the special optical properties of the glass he had made, he says of the one to which we are mainly confining our remarks: "Baryta (glass) again, makes one wonder what will come next. Being heavy, we are not surprised to find it a high refractor, its index being over 1·6, but its dispersion is low indeed, for it scarcely exceeds that of rock crystal. To it crown glass would take the place of a flint, with the previously noted advantage of shortening instead of lengthening the focus. It is a bad glass to make, not hard to melt, but so addicted to dissolving traces of iron, and turning yellow, that the clay must be very pure for making the crucible, and iron must be kept from it in crushing, or cleared out by acid when so used."

Having indicated where these experiments of Mr. Dawson are to be found recorded, we need not quote farther from them, but will draw one or two conclusions from what we have said.

The Jena makers err in their assumption that the secret of making baryta glass is unknown in this country, for nothing short of an intimate experimental acquaintance with it and the other kinds of optical glass could have enabled Mr. Dawson to write as he did. Again, if Mr. Dawson, who is not a professional glass-maker, but an engraver and printer, could carry its manufacture and note its peculiarities to the extent that he did, it is begging the question to assume that all baryta glass must of necessity be made in Jena. It may be alleged that the works of this gentleman were merely laboratory experiments. But, if successful in the laboratory and in the hands of an amateur, how much greater ought not the success to be expected when made by experts, in proper premises and with the surroundings of the professional glass-maker?

It scarcely redounds to the credit of English optical glass-makers that they confess to failing to produce the important kind of glass so often mentioned in this brief article. We have seen specimens of Jena (baryta) glass wonderfully free

from colour, but, on the other hand, we have seen some lenses made with it so yellow, from the presence of iron, as to make one wonder at the lenses not working very slowly.

From what has been said it may be inferred that it may be possible to have non-astigmatic and other photographic lenses of the highest quality, made in this country, of glass which has not necessarily to be imported from Germany.

In conclusion, optical glass-makers retain the secrets of their trade well. Even the discovery, by accident, of the Swiss clock-maker, Guinand, who was also an amateur telescopic glass-maker, while it has revolutionised the optical glass trade of the world, has never yet been publicly divulged, but has been mainly retained in the hands of various members of his family. Let us indulge the hope that our home manufacturers will yet enable us to be independent of foreign countries in the obtaining of our optical glass supply.

PYRO-SULPHITE'S YELLOW STAIN.

It has taken a long time for the true function of sulphite in the pyrogallic developer to become thoroughly understood; but it is now fairly well known that its preservative action upon solutions of pyro is the least important of its duties. In the latter case it has need of the assistance of a free acid, or colouration will not be long before setting in. Sulphite of soda acts mainly, it is believed, by dissolving in a colourless form the results of the action of the oxygen of the atmosphere, while acid additions greatly lessen the tendency to absorb that element. When the two are combined, their combined action seems to retain the colourless condition for a long period if the air be fairly well excluded; entirely, if the exclusion is complete. If proof were needed of the manner of action, it would be found in the fact that, when in the opposite condition—that is, alkaline—pyro is so greedy an absorbent of oxygen that such solutions, with alkali in excess, are used by chemists to absorb oxygen from the air. By many a preference is given to one or other of the acid sulphites, notably the so-called metabisulphite; but it is difficult to see why a salt four times the price should replace the simple neutral salt acidified by free acid if required; for, when development takes place, and alkali is added, the surplus acid must combine with the latter, and there is then in the developer an entirely negligeable condition—an alkaline sulphite instead of sulphate, citrate, &c. The result then is, as a far smaller proportion of the meta salt is recommended to be used, there remains in the developer a much smaller proportion of sulphite to perform its special function in the developer itself, of which we will speak further. In pyro development we attach little or no importance to its action as an aid to development, in which regard it plays quite a different *rôle* with the newer developing compounds—amidol and its congeners—with which it acts in lieu of alkali entirely. It is not to be understood that we deny it to possess any action, for we have in our possession a negative of excellent quality developed entirely by pyro and neutral sulphite. The time required to attain full printing intensity was, it is true, greatly protracted—thirty or forty minutes; but the result could not be differentiated from one treated in the every-day manner. It may be suggested that the slight amount of free alkali was responsible for the image production; but, in reply, we must say that the sulphite used was some we obtained in our own laboratory by recrystallisation from a first-class commercial sample.

We are thus led to discuss its most pronounced property, that of preventing the production of the yellow stain abhorred of some, praised by others as conducive to good printing quality. We are afraid we cannot be classed among the adherents of the latter theory for printing a colourless negative. We can always stain it if we wish, and, what is perhaps more, we graduated in the wet-collodion school of glass negatives, and can always see a beauty in the oft-times derided wet-plate quality.

Again, when lantern slides or glass stereoscopic views are to the fore, we apprehend that no one would decry such quality or see beauties in the yellow stain.

It therefore becomes of some importance to see how such absence of stain can always be secured. We have, with this end in view, been recently making a large number of observations on the results of pyro-ammonia with sulphite. It is known that great variations do exist, as also a hazy idea as to their cause. We will try to remove some of this haze. In the first case we found that the time occupied by development was an important factor. A plate that would fix out a beautiful steely grey when the negative was finished in, say, five minutes, gave a decided stain in ten.

Next, we found a great variation experienced when different makes of plates were employed, and it soon became plain that the thinner plates that showed the image well through at the back required little more than half the amount that the thicker films needed to obtain equal freedom from yellow stain, so that a constant formula with this end in view could not be devised.

We next found that, apart from the effect of prolongation of the development period, the dilution or concentration of the solution had no important effect. The point to be attended to was the proportion of the sulphite present to the developing ingredients, and not to the water.

Further examination of results showed that the great secret of controlling the colour was to proportion the sulphite to the alkali used. Taking, to start with, a certain proportion as standard, we found it needful, whenever more ammonia had to be added, that yellowness was bound to supervene unless the sulphite was similarly increased in proportion. Ammonia-pyro was what we chiefly studied, and, to put the matter in a concrete form, we found that, using a fairly thick plate, two grains of pyro, one minim of ammonia, and eight or ten grains of sulphite gave excellent results; but, if a plate were started with this formula and more ammonia then added, there was needed, to prevent yellowing, more than the same proportion of sulphite to ammonia than the standard proportion. Hence the great secret of preventing yellow stain (apart from the important point of the condition of the hypo) might be said to consist in adding plenty of extra sulphite solution whenever ammonia was added. With this conclusion, we leave the matter in our readers' hands, feeling assured, if they try it, their conclusions will resemble our own.

DEVELOPING GELATINE NEGATIVES OF LINE SUBJECTS.

In the ordinary run of photo-zinc work, where the lines are neither very fine nor particularly close together, there will scarcely be any trouble experienced by the ordinarily careful worker in getting any desired degree of density without any filling up of the transparent lines, that is, of course, assuming that a plate is used that is fitted for the purpose in view. As has been already suggested, if the plates are specially and

carefully prepared for this purpose, as perfect negatives may be produced as with wet collodion, but where the commercial article is relied upon it should be selected with judgment. The best and quickest plates for ordinary purposes are certainly not necessarily the best for this; indeed, rather the opposite view may be taken, for, as a rule, the slower plates answer best. Suitable plates, specially adapted to the purpose in view, are nowadays prepared by most, if not by all, plate makers.

But it is where the finer class of work has to be dealt with that the greater difficulties are met with, a remark that applies alike whether collodion or gelatine plates are in question, though probably the trouble in getting the finest results is proportionately greater with gelatine than with collodion. This is due, in a measure, no doubt, to the different system of development, or rather to the difference in the constitution of the developed image on the two kinds of films respectively. The wet-collodion image consists of finely divided metal deposited upon the surface of the film; while, in the case of gelatine, the image is formed on the film by the reduction of the fine particles of silver bromide therein contained. In the first instance there is practically no limit to the quantity of silver that can be piled up on the film, if care only be taken to avoid depositing it in the clear lines, and so blocking them. On the dry plate, however, in order to reduce the metal throughout its whole thickness, it is necessary to continue the development for a very protracted period, during which the reduction of the bromide goes on in all directions from the particles already reduced, both downwards and laterally, and by the latter action the clear lines are gradually but surely closed up.

It is well known that a similar restraining action to that exercised by the acid in physical development is exerted by bromide in the so-called chemical development. The bromide, as has been shown by Mr. W. K. Burton and others, acts as a restrainer, or rather a retarder, only, and does not arrest development altogether, or, what would be tantamount to it, destroy the impression produced by light. But, according to the strength of the bromide solution employed, so will its retarding action prove greater, although not proportionately on all portions of the image. As the strength is increased, the retarding effect becomes disproportionately greater in the more feebly exposed portions of the image than upon the high lights or better exposed; hence the value of bromide as an addition to the ordinary development when this is to be used for intensifying purposes.

It has been said that bromide does not act as a destroyer of the image impressed by light; but, for all practical purposes, it can be made to behave as such—that is to say, it can be applied at such a strength as to completely arrest all developing action upon those portions of the film that have been but feebly impressed by light, and it is upon this fact that we base our method of developing the more difficult class of line subjects. We do not confine the system to any particular form of development, though, for reasons already given, we prefer one or other of the newer forms, as being freer from stain. Preferably, we should use metol or meto-quinone.

In the first place, a full exposure should be given in the camera, that is to say, an exposure that will enable the whole image to be brought up quickly, without any forcing, using a developer of normal strength and a fair dose of bromide. Have ready, in a separate glass, a stronger developer, *i.e.*, stronger in reducing agent, though not necessarily in alkali, restrained with bromide to the extent of ten or a dozen times the normal quantity; the exact proportion is immaterial provided it be sufficient.

As soon as the image has appeared in all its parts under the normal developer, pour this off, and apply the other, or intensifier, and allow it to act until the requisite density is secured. Under the heavy dose of bromide, no trace of image or of fog is developable in the portions of the film that are clear when it is first applied, and it is only where there is already a deposit that intensification goes on slowly, but with perfect regularity.

The Royal Photographic Society's Progress Medal.—It is stated, although no official announcement has yet been made on the subject, that the Progress Medal of the Royal Photographic Society has been awarded to Dr. P. H. Emerson. If this should prove to be the case, nobody would more cordially endorse the award than ourselves, for the effects of Dr. Emerson's teachings and writings on pictorial photography have been of a distinctly improving and refining character.

Photography as a Humiliator.—In the accounts of the degradation of Captain Dreyfus, in Paris, it is stated that, after he had been stripped of his gold stripes, buttons, &c., and his sword broken, he was in that dilapidated state marched in front of the troops, round the four sides of the square. He was next taken in the prison van to the anthropometrical department and measured. He was then photographed. It is the first time we have heard of photography being used under circumstances that would be so painfully discreditable as those quoted.

Patents Applied for in 1894.—The record of the number of applications for patents has again been broken. Last year the number applied for was 25,372, as against 25,102 in 1893, which broke the record of the previous year by nearly a thousand. Each succeeding year since the passing of the present Patent Act has shown a marked increase over the previous one in the number of patents that have been applied for, though last year it was less marked than in any former one. It is needless to say that photography has contributed its share to the number. Our weekly list has shown that already.

A Novel Expedition.—Herr von Payer, of Vienna, is said to be organizing quite a novel expedition to North-east Greenland. Unlike other expeditions to the Polar regions, it is not to be for geographical or scientific discoveries, but simply artistic. It is said that quite a number of painters, photographers, journalists, naturalists, and others are besieging him with offers of their services. Amongst the paraphernalia proposed to be taken are glass *ateliers* for both deck and land, made secure against the attacks of bears and capable of being heated. It is stated that riflemen from the Tyrol are to accompany the expedition, to provide the painters and photographers with fresh meat. A difficulty in connexion with the adventure is alluded to, namely, how to get for the painters an oil that does not freeze at very low temperatures. Herr von Payer says that on a former expedition he was able to draw for several hours a day with the thermometer 50° Centigrade below zero. That is more than some artists could do. It will be interesting to learn, if the affair comes off, how the photographers will get on, and how their plates, whether developed on the spot or not, will behave under such a degree of cold. The photographers who propose to join this expedition will not be envied by many we could name.

Insoluble Gelatine Films.—Some little time back a patent was obtained by Herr E. Schering, of Berlin, for a method of rendering gelatine films insoluble by the action of formic aldehyde. At

second patent of the same gentlemen has just been published which has special reference to the preparation of orthochromatic plates and films. It is found, according to the specification, that the addition of the formic aldehyde to an orthochromatised (with erythrosine) gelatino-bromide emulsion does not in any way adversely interfere with its orthochromatic properties, but rather enhances them than otherwise. Therefore the patentee proposes to form orthochromatic films in which formic aldehyde is added to the emulsion to render it insoluble, as well as another gelatine film upon which it is supported. The *modus* is this:—A layer of gelatine containing the formic aldehyde is first spread upon a plate and dried. On that is spread the orthochromatic emulsion, and when that is dry the whole is stripped off as a compound film for use. If, says Herr Schering, 3 c.c. of a 36 per cent. solution of formic aldehyde be added to 100 c.c. of a 20 per cent. warm solution of gelatine, it, if allowed to cool, can still be brought into a fluid condition by heat; but, if the film be dried it will, with these proportions, become quite insoluble, or, with a smaller quantity of the insolubilising agent, partially insoluble. In this respect the formic aldehyde becomes analogous to the salts of alumina, and gives us another means of rendering a film of gelatine analogous to a piece of leather.

The Free Portrait Scheme in Paris.—The Tanquerey Portrait Society, a concern which, if we remember rightly, had an adventurous career in the United States, has migrated to Paris, and from that safe vantage ground is distributing its alluring circulars in this country. This is how the precious document runs: "Tanquerey Portrait Society, 29, Boulevard des Italiens. Dear sir,—The above is the name of an association of first-class artists, formed for the purpose of executing artistic crayon portraits at prices within the reach of all. Our crayon portraits, as you can see by the many testimonials enclosed, are the finest made in Europe, their perfect resemblance to the original and artistic finish are the admiration of all those who happen to see them; yet they will be of very little use to us unless they are made known to the public in general. For this reason we make you the following *bonâ fide* offer, viz., If within thirty days from date you send us a photograph of yourself, or any member of your family, living or dead, we will make you from it one of our finest life-size crayon portraits of a value of 5*l*., absolutely free of charge. The only favour we ask you for this splendid offer is that you recommend our work to your friends and acquaintances. This is all we ask; for on the merit of our work will depend future orders at the full price. Enclosed please find one coupon entitling you to such portrait, which must be returned with your photograph." We suppose it is unnecessary to warn our readers to have nothing to do with this or any similar scheme, but we hope they will do all in their power to prevent the outside public from parting with their photographs.

Solutions of Metallic Silver.—Some most interesting papers by Mr. Carey Lea upon this subject have been appearing in the *American Journal of Science*, the conclusions he draws from the results of his many remarkable experiments being discussed to some extent, denied by other writers in the same journal—Mr. C. Barns and Dr. E. A. Schneider—who, however, disclaim intention to controvert them, thus: "In the absence of Dr. E. A. Schneider, I wish to say there does not seem to be any real issue between the recent note of Mr. Carey Lea and our own work." The point to decide is the actual state in which the metallic silver exists in the remarkable solutions discovered by Mr. Carey Lea. Is it actually in solution, or is it merely suspended in the form of almost infinitely minute particles? Mr. Barns says that, for solution to take place, the ultimate molecule must be reached. "But . . . . may not the separation stop short *before* the molecule is reached; or, conversely, when a precipitate is being formed out of individual molecules, may not the process of growth be arrested in virtue of an equilibrium of forces when the particles formed consist of 2, 10, 100, or even 1000 molecules?" That is to say, is not the "silver solution" rather ultra-microscopically fine mud? Mr. Carey Lea, with some such query in sight, has experimented to find an answer, and says that both he and other observers find the solution is not able to pass through membranes, that chemical reactions point to true solution, and, further, that, if examined under a skylight, every physical indication is that of solution rather than turbidity. Working in friendly rivalry, these observers will, no doubt, eventually discover the truth in this matter most interesting in photographic technics.

Incongruities in Photographic Portraits.—Photographers are often twitted by painters on the inartistic character of their productions. Although the reproach is frequently ill-founded, it must be confessed that often it is not. A case in point is now before us. It is a cabinet-size portrait of a lady clad in heavy furs and carrying a pair of skates. The picture, so far as the figure is concerned, is excellent. It is naturally and gracefully posed, and the lighting is perfect. But the picture, as a picture, is completely spoilt by the incongruity of the background, which is a garden scene in summer-time—bright sunshine and flowers in full bloom. The background, by itself, was really a very artistic one, and one with which no fault could be found; but it was the combination of a figure attired in heavy winter clothing, with a pair of skates, with a bright summer background that rendered the work, in the eyes of an artist, simply ridiculous. If no more suitable outdoor background were at hand, one of an interior could have been used. An interior background, for a lady in walking costume taken standing, would really not be so out of place as the one employed in the picture before us. We should not have referred to the matter if it were an isolated case; but, if one examines the specimens exhibited by some of our leading portraitists, they will frequently meet with examples of quite as great incongruity as that just commented upon. By the way, backgrounds of winter scenes are not to be found in all studios, doubtless because there is in this country too little opportunity for their seasonable employment to warrant the outlay for them. However, in back volumes we have pointed out how any one can easily convert an old and otherwise unserviceable outdoor background and accessories into a snow-clad scene for winter use.

COLLODION EMULSION FOR PROCESS WORK.

That the wet-collodion process, in spite of its many troubles and difficulties, still keeps its position as the favourite method for making negatives for all photo-mechanical purposes is, I suppose, an undisputed fact, although, for many years past, strenuous efforts have been made to utilise the quicker gelatine films. Mere rapidity is, however, for the purpose in question, a quality of far inferior importance to that of being able to render black and white absolutely as such, or, in other words, to obtain images combining opacity in the lights with perfect clearness of the transparent lines. So far, with gelatine emulsion films, the task has proved, if not impossible, at least far more difficult than with collodion, for which reason the latter process in this department of photography still retains the leading place.

But, though when collodion and bath are in perfect order the operations connected with the production of the type of negative required by the process worker are comparatively simple, the task of keeping matters in that happy state of comfortable practice is not so easy, for the absolute clearness of shadow demanded in this class of negative necessitates a more than usually high degree of working excellence, which is not always readily kept up in the press and hurry of a heavy business. A process, then, that offers the possibility of wet-collodion results without any of the drawbacks of the treacherous silver bath, should be welcomed by all who are interested in this branch of negative production.

Such is offered by collodion emulsion, not perhaps as worked in the ordinary way for landscape or transparency purposes, although even then, given a little care in adapting a new process, very fine results may be obtained with far less trouble than with gelatine. But, working on the lines indicated by Mr. Edwin Banks in these columns two or three weeks back, every difficulty is removed, and collodion emulsion is placed upon a footing equal, if not superior, to wet collodion with the bath. To sum it up in its briefest form, Mr.

Banks's process provides an emulsion that will keep for a practically indefinite period, certainly far longer than the ordinary iodised collodion, that is absolutely free from fog or veil, and is scarcely more sensitive to light in bulk, or before washing, than ordinary collodion before dipping in the silver bath, and that only requires spreading upon glass and washing in order to bring out its sensitive qualities, though a variety of modifications in treatment at this stage are capable of producing corresponding alterations in the degree of sensitiveness and in other qualities. In fact, the Banks's emulsion practically takes the place of the old iodised collodion, and only requires water instead of the messy and uncertain silver bath to render it sensitive.

The idea of adding bichromate of potash to collodion emulsion is scarcely a new one, though all the credit belongs to Mr. Banks for working it to a practical use. Seventeen or eighteen years ago the same idea occurred to me, though for a different purpose, and I believe I recorded my failure in the JOURNAL at that time. At that period *washed* collodion emulsion was being worked up to the highest possible degree of sensitiveness for landscape purposes—it was before the general adoption of gelatine plates—and for this purpose it was necessary to allow an excess of silver nitrate to be present in the emulsion for a certain time, to be neutralised or converted into silver bromide previous to completing or washing the emulsion. In performing the neutralisation it was desirable to use as small an excess of soluble bromide as possible, in order not to injure the sensitiveness of the preparation to any extent; but it was extremely difficult to hit just the exact balance of the proportions of silver and of bromide.

Under these circumstances it occurred to me to use potassium chromate in the character of an "indicator," to show exactly when the last trace of free silver was converted. For this purpose a few drops of concentrated solution of the chromic salt were added to the emulsion containing excess of silver, when, of course, the characteristic red colour of silver chromate was produced. An alcoholic solution of bromide of cadmium and ammonium was then added, drop by drop, until the colour was just discharged, and, if after standing for some minutes there was no return to the red, the emulsion was washed in the ordinary manner.

The curious part of the matter was that the emulsion prepared in this way, and washed either by evaporating in a thin layer or by pouring into water to precipitate the pyroxyline and silver bromide, proved absolutely insensitive and incapable of recording a photographic impression. By considerably increasing the strength of the developer a reduction in the form of fog might be produced, but, no matter what exposure was given in the camera or otherwise, there was no sign of a developed image. I consequently gave up the idea, attributing the result to the formation in the emulsion of some insoluble or basic compound of chromic acid which was liberated by the alkaline developer, and destroyed the image or undid the action of light before the developer could act.

As a matter of fact, it turns out that the result was simply due to the difficulty or almost impossibility of entirely removing the soluble chromates from the mass of emulsion, although it is easily done in the thin film spread upon glass for exposure. Even when precipitated in fine flocks by pouring into water, the particles of emulsion shrink into a hard, impervious condition, enclosing a portion of the chromate which it is quite impossible to remove by any reasonable length of soaking, but which is liberated to exercise all its desensitising action when the dried emulsion is redissolved.

When, however, the emulsion instead of being washed in bulk is used as indicated by Mr. Banks, and each film washed separately, the removal of the bichromate is perfectly easy, indeed, when water flows evenly over the surface of the film, or to use the old expression, "when greasiness has disappeared," which means that all traces of the ether and alcohol have been removed, the bichromate may also be considered to be practically gone through; it is better on all accounts to continue the washing some little time longer.

Now, for practical purposes, Mr. Banks has fully described the method of making the emulsion, and has given a formula, so I need not go over that ground again. If, however, there are any of my readers who happen to have by them any spoilt collodion emulsion—*i.e.*, spoilt by fog or similar causes, for granular or otherwise imperfectly precipitated bromide is of no use—they cannot do better than apply Mr. Banks's process to it. First add to it a few grains of nitrate of silver, dissolved in hot alcohol, sufficient to leave an excess of that salt in solution; next add a few drops of a strong solution of bichromate of potash or ammonia—the quantity is not very material, so long as it gives the emulsion a deep red colour—and finally add, drop by drop and shaking after each addition, a thirty-grain solution of bromide of cadmium in alcohol until the original yellow colour of the emulsion is restored. It is then ready for use.

To show the value of the bichromate treatment in removing fog, I may state an instance from my own practice. A quantity of collodio-chloride, containing a considerable excess of silver, and so small a quantity of free acid that it had acquired a pale brown colour from the action of the silver on the collodion, was treated precisely as described, except that there was no need to add more silver. Twelve hours after the addition of the chromate, a large excess of bromide of cadmium and ammonium was added to convert not only the chromate of silver, but also the chloride to bromide, and, after another five or six hours, a plate was coated and exposed, and, though rather slow, proved otherwise perfect and free from fog. This I take it to be about as severe a test as could be applied.

Possibly some of the users of gelatine plates only may think the process a long and troublesome one, but I scarcely imagine the wet-plate worker will hold the same opinion, even if the emulsion plates are coated and used singly. The washing to get rid of the bichromate and soluble salts scarcely takes longer than sensitising in the bath, and it has the advantage over the latter process, that the washing water does not want keeping in order as the bath does. But if the plan be adopted of coating a number of plates at once, placing them in one of the grooved washing racks now in common use, they may be left soaking in water until required for use, when they are simply taken out, drained, and placed in the dark slide, and thus the day's work is considerably expedited. Under such circumstances, each plate should be washed singly until the solvents have been removed, before placing to soak.

But there is another variation of the process to which Mr. Banks does not allude in his article of last month, namely, the adaptability of these films to physical development, or development with acid pyro or iron, in which case the results are in every way identical with those of a wet-bath plate. To secure this result, it is only necessary, after washing the plate in the ordinary way, as already directed, to immerse it for a minute or so in a ten or fifteen-grain solution of iodide of potassium, to convert the bromide into iodide of silver. The conversion may be complete or partial as desired, according to the time of immersion, but, for photo-mechanical purposes, probably total conversion is the best as giving the greatest amount of density. If only partial conversion is desired, then a short immersion, and a weaker solution of iodide, should be employed.

At this stage, especially if the whole of the bromide is converted, the film is practically as insensitive as if it contained no silver at all; but, in the interests of clean development, it is as well not to take too free advantage of this fact, but to regard the plate as sensitive. After washing or soaking for a short time to remove the excess of iodide, the film is dipped into or flooded with a thirty-grain solution of silver nitrate, rendered very faintly acid with nitric acid, and is then practically identical with a wet-collodion bath plate prepared under the most favourable circumstances, and can be used in the same manner. The additional treatment with iodide and silver need add very little to the time occupied if the method of racking a number of plates at once be adopted, as the rack load of plates may be dipped at once into the iodide, and thence removed to a tank of water to wait until required, as the soaking will rather do them good than harm. When required, and not till then, the plates are taken out singly, silvered, exposed, and developed at once. The same silver solution may be used over and over again with merely strengthening occasionally, as there is no organic matter to upset as in the case of the bath.

W. B. BOLTON.

MEDAL AND MUDDLE.

REPRESENTATIVE OF 1 PER CENT.—NOT ON COMPULSION.—AN ALTERNATIVE SCHEME.—EXHIBITION DATES.—A PHOTOGRAPHIC PARLIAMENT.

THE Conference of Judges held upon December 14 appears to have fallen into much the same error which so greatly militated against the benefit that we all hoped might follow the drafting of rules for the common guidance of those who are concerned with the giving or taking of medals for photographic attainment.

The weak point has always been that the Judges, or such of them as assembled at the third conference, do not represent any but themselves. Even this is not certain, as it was laid down that "presence at the meeting did not bind those present to accept the resolutions of the majority;" hence they lack even so much as a pennyweight of power to impose the outcome of their deliberations upon any photographic society. In spite of this obvious inherent impotence, we are treated to the spectacle of a handful or so of well-meaning gentlemen with much formality proposing, discussing, amending, and approving regulations which, combined into a code, are a singularly magnificent example of the *brutum fulmen*.

At the beginning I, and many others, understood, or, to judge by the sequel, apparently misunderstood, that the conferences of Judges were to be purely consultative meetings to draft rules and suggest courses of action, so that the affiliated societies might have the advantage of the cumulative wisdom and experience possessed by those specialists, before the societies engaged themselves in the task of adopting laws which should be binding—not upon half a dozen or half a score of estimable gentlemen who have been in the habit of distributing medals galore, but upon the societies which settle and subscribe to the laws aforesaid.

After all, whether I and others were in error or not matters little in comparison with the importance of the mistaken course of action which, I venture to think, is now being taken, in that the tail seeks to wag the body; so far has this inversion of what is right and proper gone, that the Judges actually struck out of a resolution that the rules be sent to all the British societies a clause which provided "that their (the societies') opinion on the same (the rules) be invited."

From which it would appear the Judges think that without even "by your leave," but on the contrary, *nolens volens*, it is quite feasible to ram these august laws down the throats of, not merely the affiliated, but of all the general body of societies.

I am much mistaken if most of those who are chiefly concerned will care to be improved "by order of the Star Chamber," although its members are, maybe, all photographic planets. Not on compulsion is ingrained human nature, which has to be reckoned with.

Besides, the questionable shape—a kind of ultimatum from the non-elected—in which the rules intrude themselves upon most photographic societies, they are, it is possible to imagine, in some respects unacceptable to a considerable proportion, and therefore, from the society point of view, susceptible of very much improvement.

I note that, after the Judges have confirmed the rules, the latter are to be submitted to the delegates of the affiliated societies; but the latter do not seem to have any power of amending what is submitted. Any how, the meetings of the delegates are so notoriously unrepresentative of the general body of British societies that the value of whatever they decide is an almost negligeable quantity.

Having performed the always easy task of criticising, in doing which I have tried to write without bias, let me put forward some suggestions which will possibly give the Judges and others a chance of friendly retaliation.

Whatever else may be said of the rules so far perfected by the conferences, they are presumably the best *résumé* of the present collective opinions from the Judges' standpoint and so are, at the least, a very convenient foundation to work upon.

As soon, therefore, as they are printed, I would suggest (1) that they be forwarded to every British society with a request that any suggestion of amendments be returned within a month.

(2) That a joint meeting be held in London, to which all delegates, secretaries, and presidents of societies be invited, as also the Judges, at which amendments be received and settled by a majority of those present.

(3) That a copy of the rules as finally adopted be sent to every society together with a voting paper, somewhat as follows:—

(A) Will your Society bind itself to abide by the enclosed code of Exhibition rules for the space of twelve months, from——— providing they are approved by a majority of the societies voting?

Write *Yes* or *No*.

(B) If your answer to A is in the affirmative, state below whether your Society approves the Exhibition Rules enclosed.

Write below here *Yes* or *No*.

Signed, , *Secretary*.

Name of Society.

Should not less than three-fourths of the societies bind themselves to abide by the result of the voting, and should a majority of those voting agree to adopt the rules, they might come into operation within one month of the result being officially declared, and remain in force for not more than twelve months.

At some convenient time, for instance, three months before the above term expires, a meeting of Judges, secretaries, presidents, and delegates should be again convened to make such alterations in the rules as further experience may render expedient, the societies being, as before, previously circularised.

This union of societies for the above particular purpose might—if not at first, yet very soon—have its *raison-d'être* enlarged, so that at each recurring meeting other inter-society points of interest could receive attention and adjustment.

Not to unduly enlarge upon the kind of matters which might well be settled at such gatherings, enough that there is the important question of dates of Exhibitions, which might very well be arranged when those who are most concerned meet together in large numbers; with the result that the clashing of interest, and the cloying of palate, which have lately been too evident, and which are otherwise likely to recur, will be ameliorated, if, indeed, not entirely cured.

Eventually this annual meeting might develop into what many have striven to establish—but which none have yet succeeded in giving vitality and interest to—I mean a photographic parliament; the organizers of which should take warning from the mistakes of the conferences and congresses, which have, as a rule, failed to hold the attention of the world photographic, and, while making certain improvements in the subjects brought forward, and, as regards those who are chief actors, remember that, unless, in addition, the nucleus of a large attendance is provided, such gatherings are almost sure to fall flat and steadily deteriorate. Should meetings for the consideration of judging, and for the settlement of other exhibition matters, be well attended and become annual fixtures, there would be what I may term a regular stock audience available, more or less, and probably glad to participate in meetings devoted to ordinary matters of general photographic interest.

I hope my remarks give umbrage to no one, least of all to the Judges; for, be they right or be they wrong, I, and all others who hope that photography and its societies may flourish, owe much to these gentlemen for the services they have in the past freely rendered, and for the pains they are now taking to try and improve the regulations relating to prize-giving.

HECTOR MACLEAN.

INSTALLATION OF CARBON PRINTING.

[Autotype Notes.]

IN the last article the manipulating room was dealt with, also the appliances necessary in it, except, perhaps, the two most important items—the developing tray, and the arrangements for hot water. These we will now consider. With regard to the former, its size will necessarily be dependent upon that of the prints to be developed in it. But, in any case, it is advisable to have it of ample dimensions, even if working small pictures exclusively. There will then be greater comfort in manipulating, and a large body of water is easier to maintain at a given temperature than a small one. A convenient size tray for general work, when that does not exceed, say, twenty inches by sixteen inches, will be thirty-six inches by thirty inches, and about six inches deep. It should be made of stout tin, or, better still, on account of stability, galvanised iron. It should be fitted with a plug and tube at one corner, to conveniently run off the water as occasion may require. If space can be spared, the tray had better be made a fixture, and placed in front of a window.

Supposing the developing tray cannot be permanently fixed in position, it should be mounted on legs, or otherwise supported, so that one or more Bunsen burners can be placed beneath it to keep the water warm. If gas is not available for this purpose, there are paraffin oil stoves that will answer admirably. With ordinary paraffin heating stoves there is always an unpleasant odour and smoke given off, unless the wicks are kept carefully trimmed and the stove scrupulously clean. Should, however, paraffin as a source of heat be adopted, I would recommend the new form of stove, in which no wick is employed, the oil being converted into vapour, mixed with air, and consumed as a Bunsen flame.

If much carbon work has to be done, it will be found a con-

venience to have a supplementary developing tray alongside the other, and this may be of smaller dimensions. The advantage of the second tray in practice is that, in case of over-exposed prints, they may be transferred to it, where the water can be of a higher temperature, and there allowed to soak, out of the way, while the other pictures are proceeded with. In this way work will be much facilitated. If the developing tray be made a fixture, and is of galvanised iron, it may, when otherwise out of use, be utilised as an ordinary sink; or, if fitted with a wooden cover, it will form a useful bench.

The next thing for consideration is the supply of hot water. In mentioning that the developing tray should be arranged so that a gas or oil burner could be placed beneath it, the object in view then was simply to maintain the temperature; but it is obvious that, with a larger source of heat—several burners, for instance—the water might thus be brought to the requisite temperature in the first instance, and that is often done. I might mention that, in one Continental establishment in which I was engaged a couple of years ago, the only source of hot water for the development of even the largest plates in a photo-mechanical process was a series of gas jets under large copper trays, and, for aught I know, the same system is still followed there. I merely allude to this fact to show that this simple method answers well. Those, however, who adopt carbon printing in their every-day practice will certainly find it advantageous to have a separate and distinct supply of hot water, and for these reasons: Where there is not an independent supply, we have no means of utilising to the full one of the greatest advantages of the carbon process that of modifying the picture in the development. The same water has to be employed for the whole of the work; consequently it becomes highly charged with pigment, and also with the chromium salt. This latter, in large quantity and with continual working, is liable to act injuriously on the hands of the operator. For these reasons, amongst others, I advise a separate hot-water supply. But what shall it be?

If work is to be done on a large scale, it will be most economical to have fixed one or other of the circulating boilers, such as are used for heating purposes, connected with a closed cistern. However, I shall assume, as I did in the first article, that the process is merely to be worked on a scale suitable to the requirements of the ordinary professional portraitist, rather than those of an extensive carbon-printing establishment. There are many inexpensive and very convenient forms of water-heaters now in the market in which gas is the fuel. The "Geyser" is one. There are various forms of it as supplied by different manufacturers. In some the products of combustion come in contact with the water, and, to some extent, are absorbed by it; but that is not of the slightest moment in carbon work. If I were asked what or which maker's apparatus I should recommend as being the best, I should find it difficult to reply. To judge from the prospectuses of some half-dozen manufacturers now before me, all are *the* best.

There is Maughan's Geyser, which is now very well known. Messrs. Fletcher & Co., of Warrington, have quite a variety of water-heaters for baths, &c., any one of which will answer the requirements of the carbon printer. Some of them are constructed to heat a small quantity of water very quickly, others to heat a large quantity more slowly, and one kind to heat the water as it passes through the pipe direct from the main. Messrs. Ewart & Son, Euston-road, also have water-heaters, after the Geyser type, that are very good. They also have one in which the atmospheric paraffin burners alluded to above are fitted. This apparatus will be a great convenience where gas is not available. The prices of the various heaters vary, of course, with the size, and range from about three pounds, or less, upward. Most of them, it may be mentioned, can be fitted direct to the cold-water supply, and work more or less automatically. When so many really efficient heaters are in the market, it would be invidious to recommend any particular one. I may say, however, that whichever one be selected I would recommend it to be of copper. It will cost a little extra at first, but, on account of its durability, it will prove cheap in the long run.

The heater should be fixed as high in the room as possible, so as to secure some force in the stream of water at the developing tray. A metal tube must be fitted from the heater to the side of the tray and terminating in a tap. To this a couple of feet or so of rubber tubing should be attached. With this arrangement we have the ready means of directing a gentle stream of hot water, or squirting one of considerable force, by simply pinching the end of the tube on to any portion of the picture as may be desired. In this simple way we can emphasise, or otherwise, effects in our works to an extent that it is impossible to do in any but the carbon process.

E. W. Foxlee.

PHOTO-ENGRAVING WITH SILVER SALTS.

[Royal Photographic Society.]

The process which I have to communicate is, I believe, but little known, although it is about fifteen years old. When it was originally introduced, the photo-engraving processes were not in vogue, but since that time, mechanical printing processes having been brought to a great degree of perfection, greater attention has been given to the subject, and I think the time has come to give a full description of this process, which I have never done before. The process is based upon the following principle: A gelatine silver emulsion is coated upon paper in a manner similar to the preparation of carbon tissue, except that a salt of silver (bromide or chloride, or a mixture) takes the place of the pigment; the sensitised paper is exposed behind a negative, and developed with pyrogallol and ammonia (no other developing agent is suitable), whereupon the portions of the emulsion which have been acted upon by light, and subsequently by the developer, are rendered insoluble, and the unaffected parts can be removed by treatment in hot water, as in the carbon process, the print being then in a condition to be used in the manner usual in the processes of photo-engraving. It can be applied equally well for either letter-press or copper-plate printing. My method differs from the processes now in general use in that no salts of chromium are employed, but salts of silver; and, secondly, because, instead of a prepared metal plate being exposed behind the negative, and afterwards developed with hot or cold water, in this case the paper tissue is exposed, developed with pyro and ammonia, and then transferred to the metal plate.

This mode of procedure permits the contact between the glass negative and the paper tissue to be secured much easier than between the glass negative and metal plate, and renders unnecessary the reversal of the negative.

As the ink used in copper-plate or letter-press printing is not capable of producing half-tones in the finished picture, the tone gradation must be secured by some other means, and is generally secured by a system of dots or points of different size. There are several methods of producing this grain. One method very largely employed at the present time consists in taking the negative through a screen of finely ruled glass; a second is by dusting powdered asphalt upon the metal plate, and afterwards developing the image upon the plate so prepared. For letter-press work, of course, a negative only is required; but, if the copper-plate process is employed, the transparency must be a positive. For the purpose of this demonstration I propose to use a portrait of our President, having obtained, by his permission, an albumen print from Mr. H. S. Mendelssohn, the author of the portrait, from which I have made a negative through a screen produced by Levy, of America, and having 133 lines to an inch. The screen consists of two plates, ruled each in different directions, and cemented together so as to form practically one piece of glass; it is placed in the special carrier in the dark slide, and in contact with it is placed a sensitive plate. I used the ordinary gelatino-bromide plates; on this occasion it was a plate prepared by Messrs. England—slow, but very clear.

To illuminate the portrait, I used my favourite magnesium lamp, and I find that the interposition of the screen between the plate and the transparency increases the exposure necessary by about three times. For producing the negative (which I pass round for examination) thirty inches of magnesium ribbon were burnt, half on one side of the frame, and half on the other, lens *f*-11. It is very important that the glass screen should be perfectly clean, as the network is so fine that the slightest dust upon it will render good results impossible.

I will now proceed to work the process. The negative which you have seen is placed in the printing frame with a piece of the sensitised paper, and the metal plate is next prepared. I use a copper plate, but brass would do as well. I have succeeded in obtaining a fine-surfaced copper plate, requiring very little polishing, and which does not produce the "devils," which are sometimes met with in process work. Snake-stone, followed by charcoal, is used for polishing the plate, which should be placed upon a board covered with thick felt to prevent slipping, and, after the polished plate has been washed, it is ready for transfer. I now make the exposure by burning a sufficient length of magnesium ribbon (in this case about four inches, the negative being very clear) and develop with the following:—

A.

Water	100 parts.
Pyrogallic acid	10 ,,
Citric acid	1 part.

B.

Water	100 parts.
Ammonia	12 ,,
Potassium bromide	4 ,,

To develop, carefully measure 10 drops of A and 14 of B, add about 45 c. c. of water. Wash the exposed tissue in order that the developing solution may flow freely over it, and apply the developer, mixing a fresh portion if it becomes discoloured. If the development is prolonged, it is necessary, after developing, to neutralise the last trace of ammonia with acetic acid in weak solution, or the emulsion will be rendered too insoluble on the surface. The print, being developed, is squeezed into contact with the copper plate. It is a good plan to press in this stage for one instant in the copying press (not too strong).

At this stage the manipulations do not differ from those of the carbon process, except that the carbon tissue requires to remain for at least a quarter of an hour before development is proceeded with. In this case, hot water is applied almost at once, and the paper removed, leaving the emulsion on the plate. The unaltered silver is then washed out with warm water (about 30° C.), exactly as in the removal of the pigment in the carbon process. When this is completed, the image is seen to be formed of very fine points, like needles, and they are swollen, and, if they were dried slowly in this condition, little filaments would remain between them.

It is therefore requisite to cause these swollen points to shrink, and this is done by the application of alcohol, first diluted with half of water, and followed by the strong alcohol—ordinary methylated spirit will do. The plate is then ready for etching. It is better to allow the plate to remain for several hours to get thoroughly dry, as damp gelatine is easily affected by the etching solution.

A different class of grain is produced by the use of asphalt in the dusting box, the construction of which is shown in the print which I pass round, and a similar effect can be obtained by dusting the plate with asphalt powder from an indiarubber ball or bellows. The plate, with the asphalt deposited upon it, is placed upon a stove or heated over a flame in order to partially melt the asphalt and cement it to the plate.

The copper plate, while heated, changes colour, and when it acquires a steel colour the plate is in proper condition, and, after the plate is cooled, the image can be developed upon it. Observe that the image upon the plate is not fixed with hyposulphite of soda in the usual way, as the hypo dissolving the silver salt in the emulsion would silver the plate, which is not desirable. The etching is performed by solutions of sesquichloride of iron of different strengths, those which I use being respectively 45°, 43°, 40°, and 37° Beaumé. The strongest solution is applied first for ten minutes, afterwards the second and third for the same time, and, finally, the 37° for fifteen minutes. The gelatine is removed from the surface with a solution of a caustic alkali, and the plate is then finished and ready for printing from, except that it is sometimes necessary to remedy some imperfection or etch certain parts more deeply. The *clichés*, which I shall show you and print from, have not been treated in this way, but are just as they were etched when removed from the etching solution.

There is no absolute necessity to make a negative through the ruled screen. An ordinary negative can be taken, and the ruled screen on the film put in contact with it, and this printed on the argentic tissue and treated as previously described. In order to secure the utmost sharpness, no glass should be interposed between the negative and screen or argentic tissue, and for this reason either the negative or the screen must be on the film.

LEON WARNERKE.

COMBINED *VERSUS* SEPARATE TONING AND FIXING BATHS.

[Photographic Scraps.]

THE controversy that has occupied much attention during the past two years, as to the merits of separate toning and fixing baths as compared with the combined bath, has led us to make some experiments on the probable permanence of prints produced by these methods, and, although by no means complete, we hope they may be of value to photographers.

The fading of prints is a matter which has not yet been thoroughly thrashed out, and is very frequently confused with their yellowing. Fading and yellowing may, and often do, take place simultaneously, especially in the case of albumenised paper, but yellowing may take place without the print fading.

The yellowing is, as we have shown in a previous paper, due to the presence of an insoluble silver compound in the high lights (which, in the case of albumenised paper, the present mode of fixing cannot remove), combining with the sulphuretted hydrogen present in the atmosphere and forming sulphide of silver; this does not seem to occur in gelatino-chloride paper, as the high lights of such prints do not contain silver *if the fixing and washing have been properly carried out.*

Fading, on the other hand, seems to be a different matter. Looking at it from a theoretical point of view, there seems to be no reason why sulphide of silver should not last for ever without change when once it has been produced, but the silver of the image is not pure reduced silver, but silver combined with organic matter. If a print that has been fixed and washed be then immersed in a solution of sulphuretted hydrogen, made alkaline with ammonia, the colour changes slowly to a photographic brown, but, at the same time, it loses greatly in vigour, and, if left long enough, will fade away almost entirely, the sulphuretted hydrogen probably attacking the organic matter and reducing it to a colourless compound.

In our experiments, we have confined ourselves to the formulæ generally recommended for gelatino-chloride paper. That which we used for the combined bath was made up as follows:—

(1)	Hyposulphite of soda	20 ounces.
	Alum	5 ,,
	Potassium sulphate	2 ,,
	Sodium sulphate	10 ,,
	Water up to	160 ,,

The hypo was first dissolved in the water, and then the other salts added:—

(2)	Chloride of gold	15 grains.
	Acetate of lead	64 ,,
	Water	8 ounces.

No. 1	8 ounces.
No. 2	1 ounce.

The sulphocyanide toning solution was made up according to the Ilford formula:—

Sulphocyanide of ammonium	30 grains.
Chloride of gold	2 ,,
Water	16 ounces.

We have selected these baths as the most generally used and most typical examples of the two classes of solutions usually recommended.

Prints on P.O.P. were made from the same negative ($7\frac{1}{2} \times 5$), and printed as far as possible to the same depth, one corner of each piece of paper was protected from the action of light by interposing between the negative and the paper a piece of opaque material. The prints were then toned and fixed in the separate and combined baths. After washing they were dried.

When dry each print was cut in two, diagonally, so that each half contained a portion of the white unprinted paper. One half was set aside for comparison, and the other subjected to test.

The halves to be tested were placed in a large wide-mouthed glass jar, in the same jar there was also placed a small bottle about half full of sulphuretted hydrogen water, the jar was then closed by means of its glass stopper and set aside for twenty-four hours. Besides prints toned in the sulphocyanide and combined baths, we exposed others which had been simply fixed in the combined bath (no gold being used), fixed in plain hypo and then toned with sulphuretted hydrogen water containing a little ammonia, and some fixed and not toned in any way.

On examining the prints at the end of twenty-four hours, we found as follows:—

Toning Bath.	Condition of Print.	Condition of High Lights.
Sulphocyanide. Print toned to purple.	Darker in colour, the purple having changed to blueish colour.	Unaffected.
Combined bath with gold. Toned to purple. Immersion, 7 minutes.	Faded to a yellowish brown.	Yellow. This change was most probably due to the print having been removed from the bath as soon as the desired tone was obtained, but not long enough to properly remove all the salts of silver.
Combined bath without gold. Toned to brown.	Very badly faded. Half-tones almost invisible.	Unaffected.
Fixed in hypo. Toned to brown in alkaline sulphuretted hydrogen water.	Ditto.	Ditto.
Fixed in hypo. Untoned.	Faded, but not quite so badly as sulphuretted hydrogen toned.	Ditto.

These results are, we hope, interesting and instructive, as, by subjecting prints to the action of damp sulphuretted hydrogen, we obtained, in the course of a few hours, results that would have taken years to bring about if the prints had been simply exposed to impure air. It will be seen that prints toned with sulphuretted hydrogen, or by *any bath which evolves sulphuretted hydrogen and the combined bath as at present made up, i.e., containing alum, always does*, are bound to be fugitive; on the other hand, prints toned with such a bath as the sulphocyanide, or any other which gives a large deposit of gold, have a much better chance of resisting the effects of sulphuretted hydrogen on the silver of the image, and of being much more lasting.

It has been frequently suggested, in order to test the permanency of a print, to place it in a glass wide-mouthed bottle with some water and to expose it to the action of light for a fortnight or three weeks, and at the end of that time, if not permanent, it will show signs of fading. With this suggestion we do not agree, as some prints so treated have retained their tone at the end of two months, the temperature and the moisture being such as to cause the gelatine actually to drop from the paper.

In conclusion, we would recommend all users of P.O.P. to tone their prints in such a manner as to get the greatest possible quantity of gold in place of the silver, and, though they may use a few more grains of gold, the greater permanency obtained is well worth the expense.

A. Haddon.
F. B. Grundy.

THE ROYAL PHOTOGRAPHIC SOCIETY.

The Annual General Meeting of the Royal Photographic Society takes place on Tuesday, February 12. Among the other business of the meeting will be the election of Members of Council, and in view of the fact it may be interesting to note how the outgoing members have discharged their duties in the matter of attendances. Below we append the official particulars. Roughly speaking, out of a highest possible attendance of ten, the average for each member is about seven attendances, a very gratifying result. In our opinion, a body which does its work in such a manner as this deserves, as it will probably receive, re-election *en bloc*.

Attendances of Members of Council during 1894.

Meetings.	Name.	Attendances.	Meetings.	Name.	Attendances.
10	Sir H. Trueman Wood, M.A.	10	10	Colonel J. Gale	5
10	Captain W. de W. Abney, C.B., R.E., D.C.L., F.R.S., P.R.A.S.	3	10	T. C. Hepworth, F.C.S. ...	4
10	T. R. Dallmeyer, F.R.A.S.	9	10	F. Hollyer...	5
10	A. Pringle, F.R.M.S. ...	7	10	G. Lindsay Johnson, M.A., M.D., B.Sc.	2
10	John Spiller, F.I.C., F.C.S.	7	10	H. A. Lawrance, F.I.C., F.C.S.	10
10	G. Scamell	10	10	A Mackie	8
10	E. Clifton	10	9	J. W. Marchant	9
10	Thomas Bedding	10	10	J. W. Swan, M.A., F.I.C., F.C.S.	3
10	J. Cadett	7	10	J. Traill Taylor.	7
10	A. Cowan	8	10	E. J. Wall...	10
10	T. Sebastian Davis, F.C.S.	7	10	Leon Warnerke	5
10	W. E. Debenham	9	9	B. Gay Wilkinson, Jun. ...	5
10	W. England	9	10	Horace Wilmer...	9
10	T. E. Freshwater, F.R.M.S.	9	10	Chapman Jones, F.I.C., F.C.S.	10

EXHIBITION RULES.

At a meeting of the Conference of Judges held on Monday, December 10, 1894, several amendments in the rules for judging at exhibitions were agreed to. The rules now stand as follows :—

Rules.

1. The Judges' decision is final.
2. The Judges shall have full power to withhold any award.
3. The Judges shall have power to exclude all persons from the room while judging.
4. The Judges' expenses shall be paid.
5. It shall be stated in the prospectus that the awards are placed "*in the hands of the Judges*," or "*at the discretion of the Judges*."
6. The Judges shall not adjudicate upon pictures exhibited as produced with wares of special trading firms.
7. Where there is a champion class, pictures which have previously taken an award in an open class shall be exhibited in the champion class only.
8. An award shall be made to one picture only, except where, from the nature of the subject, the pictures bear an obvious relationship to one another. Each picture of a set which has been collectively medalled shall be considered for competitive purposes to have received an award.
9. There shall be no distinction between amateur and professional.
10. No production of any kind whatever from the same negative shall receive more than one award, except as defined in Rule 7. This includes lantern slides, enlargements, &c.
11. No award shall be made to a lantern slide until it has been projected on the screen.
12. It shall be stated on the entry form to what extent the work sent for competition is that of the exhibitor.
13. That, when possible, the names of those who have consented to act as Judges shall be printed in the prospectus of the exhibition.

Recommendations.

14. The names of the competitors should be withheld from the Judges.
15. The Judges should have power to give extra awards where they may think fit.
16. In order to enhance the value of awards, their number should be limited.
17. The Exhibition Committee should not accept offers of awards from trading firms.
18. The number of classes should be kept as small as possible.
19. No award should take the form of a money prize.
20. No exhibit at the same exhibition should receive more than one award.

WEMYSS BAY AMATEUR EXHIBITION.

The third of a series of Amateur Photographic Exhibitions, inaugurated by Miss Burns under the auspices of the Clydesdale Camera Club, was held on January 11 and 12 at Wemyss Castle, the seat of Sir John Burns, Bart.

The spacious covered-in tennis-court attached to Wemyss Castle was, for the time being, turned into a picture-gallery, and served for the purposes of the Exhibition admirably, the hall being particularly well lighted from the top.

The Exhibition was formally opened by C. Bine Renshaw, Esq., M.P., on Friday, the 11th, at 11 a.m., before a large and select gathering of ladies and gentlemen, including Sir John and Lady Burns, &c.

A very large number of exhibitors responded to Miss Burns's invitation to send in photographs, and each of the classes was well filled by pictures of more than ordinary excellence, all the classes being open to any amateur.

In the section for those workers who have only photographed for two years some exceedingly creditable work was shown, the silver medal being gained by Farquhar Mathieson for a well-composed picture, *On the Cart*.

The Classes for Large and Small Landscapes contained exhibits from nearly every amateur of note in Scotland.

The Judges were Mr. Gordon, of Aitkenhead (who very kindly agreed to officiate in lieu of Sir Francis Powell, who was prevented by illness from attending), Mr. George Mason, and Mr. T. N. Armstrong, of Glasgow.

The following are the awards :—

Section I.

Open to all Amateurs who have photographed under two years.

Silver medal, Farquhar Mathieson. Bronze medal, Miss M. Marwick.

Section II.

Open to all Amateurs.

Class I.—Portrait or Group: Silver medal, R. J. Keir. Bronze medal, Stuart Smith.

Large Landscape.—Silver medal, Stuart Smith. Bronze medal, Henderson Bishop.

Small Landscape.—Silver medal, A. Hinshelwood. Bronze medal, J. C. Oliver.

Instantaneous.—Silver medal, Archibald Watson. Bronze medal, Miss Henderson.

Animal Study.—Silver medal, Miss Martin. Bronze medal, Walter Wilford.

Enlargements.—Silver medal, Miss Henderson. Bronze medal, S. L. Coultshurst.

Lantern Slides.—Silver medal, A. Hinshelwood. Bronze medal, D. Johnstone.

THE PHOTOGRAPHIC NATURALIST.*

I.—Floral Photography.

Orthochromatic Floral Photography.—The perfection of modern methods of colour-correct photography adds enormously to its value as an aid to botanical study. The superiority of orthochromatic emulsions for the correct rendering of foliage is so great that the naturalist should accustom himself as soon as possible to the use of the several excellent kinds of colour-sensitive plates which are now in the market. Ordinary dry plates can be orthochromatised, if desired, by either of the following colour-sensitisers. Prepare stock solutions of cyanine, one part, in alcohol 2000 parts; or erythrosine, one part; water, 1000 parts. For use, take one drachm of either, and add ten drachms of water. If cyanine is used, it is necessary to add one drachm of a ten per cent. solution of ammonia. The plates in this case must be used within two days: but ammonia is not necessary for erythrosine, and these plates will keep six weeks after sensitising. The plates are immersed in the solution and dried in the dark. When the sensitiser is added to the emulsion, the plates keep much better, and may generally be used after several years without loss of good qualities. For this reason it is preferable to purchase ready-dyed plates. There is no unusual difficulty in the development of orthochromatic plates if care be taken to use a double thickness of ruby glass and a developer of moderate strength. Theoretically, it would seem that chlorophyll should be the best colour-sensitiser for plates intended for floral subjects; but experience does not bear this out, although chlorophyll has been used to advantage in collodion emulsions.

* Continued from page 24.

There is at present some diversity of opinion as to whether colour screens are necessary with orthochromatic plates, but a few comparative experiments will quickly show the great advantage of the screen in correctly rendering the varied tints of foliage and flowers. Although orthochromatic plates are sensitive to the green and yellow rays, they retain also an undiminished sensitiveness for blue and violet. The optical sensitiser merely extends the range of colour which can be impressed upon the photographic film. It is necessary, therefore, to restrain the blue and violet rays if correct results are desired, and in floral photography the screen should invariably be used. It must be remembered also that the exposure is not lengthened to the same extent as with ordinary plates.

With these brief remarks on the exceptional facilities enjoyed by the naturalist of the present day for reproducing all the gradations of tone of natural objects, we now proceed to consider some special methods of research.

Chromo-photography in Botanical Research.—Plant movement is so slow in comparison with that of the animal kingdom that photographic records of the rate of growth and mode of development of trees and flowers can be readily made without any addition to the ordinary photographic outfit. It is now some years since Dr. Julius Sachse took a series of photographs to illustrate the remarkable process of flowering of the night-blooming Cereus. The progressive development of the bud and its expansion into the perfect flower was shown by successive photographs taken at intervals of fifteen minutes throughout the night. The camera was rigidly fixed in one position, and the magnesium flashlight was used with orthochromatic plates. The resulting negatives showed the perceptible growth of the parts of the flower, and even an occasional tremor in its eagerness to unfold. The last plate, taken just before daybreak, showed the flower in the state of collapse which precedes its death at sunrise. Such a series of photographs affords an interesting example of the way in which photography can be utilised in the measurement of plant growth. Successive photographs of the same tree, taken year by year from the same spot, afford useful and instructive studies in botany. The value of such comparative results, however, depends entirely upon the exact position of the camera being maintained at each successive operation. To be complete, such studies should be repeated at different seasons of the year to show variations in the structure of branches, buds, and leaves. An unlimited field lies open here for the photographic botanist to undertake systematic research.

Isolated Flower Studies.—Rejlander regarded the photograph of a single flower as a crucial test of photographic skill if proper justice is done to the varied gradations of tone and texture of leaf and flower, nor can he be said to have exaggerated the wide scope for artistic taste afforded by flower studies. Some attention was excited twenty years ago by Payne's floral borders, which were produced by tastefully arranged cut flowers in an oval framework, thus making a negative, which, by masking and double printing, formed an elegant floral border for portraits. Single flower specimens can also be made into effective pictures by fastening them to a glass screen by wires cemented to the glass with elastic glue. A tinted background is then placed about a yard behind the screen. In such cases care must be taken to avoid reflections from the glass support, and also to take the photograph before the specimens get limp.

A better plan is to use the vertical camera suggested by Mr. T. C. Hepworth, which can readily be extemporised in the following manner:—On the top of the tripod a board is fixed, with a hole in the centre. To this board the camera is fastened, the lens pointing downwards through the hole. The height should be made convenient for focussing. The flowers are arranged on a sheet of glass placed midway between the camera and the floor, about two feet from the ground. On the floor is placed a suitably tinted background. The light should be arranged to give relief without heavy shadows, and by the combined use of isochromatic plates, colour screen, and plenty of exposure, excellent results may be obtained, far surpassing in beauty any arrangement in vases or flower-pots. The difficulty here, again, is to avoid delaying the operations until the flowers get limp, especially if the specimens have to be transported from a distance, for soaking in water will not always restore them to their original condition when once the tissues have become flaccid. Branches of spring blossoms may be treated in a similar manner, and look far more effective than when photographed on the tree, where the confusion of mass has to be contended with, and the background is not always suitable for the production of relief.

Greenhouse Photography.—The chief difficulties in greenhouse photography are the result of restricted space and unsuitable lighting. A portrait lens is not suitable for this class of work, on account of its want of depth of focus. It is obviously impossible to bring all the flowers and branches of a single plant into one plane; and even with a suitable lens it will be necessary to arrange and pull back obtrusive sprays with black threads or fine invisible wires. The unsightly background of glass panes should also be hidden with suitable tinted material, and the various plants grouped artistically, always bearing in mind that a few specimens will be far more effective than many. In arranging the lighting, all black shadows and strong contrasts must be avoided; and, as length of exposure is immaterial in the still atmosphere of the greenhouse, it will be well to use the colour screen invariably in conjunction with orthochromatic plates.

J. Vincent Elsden.

APPARATUS FOR ENLARGEMENTS.*

No matter what may be the facility for focussing, and the generally easy and free movement of the working parts of our camera, and the movable range of bellows, we shall still have some trouble unless our baseboard is *firmly* fixed to a support, so as to leave the hands quite free for the purpose of arranging the negative and focussing the picture. When working with an ordinary field camera, we *universally* attach it first to a substantial and steady stand prior to working the rack or screw; we don't expect to be able to focus easily without some rigid fastening or clamping of the baseboard, therefore something similar must be done with our larger apparatus if we are to work with comfort and freedom.

In default of a proper fixed bench, a four-legged table—strong, rigid, and level—is brought end on to the window of our operating room. It is convenient to have the table of the same height as the window sill, so that the end of camera which holds the negative may be thrust forth (but no further than will make the operations easy) into the open air. If we are working on the ground floor, a reflector will be requisite. This has been already described; but, if we are using an upper window, where there is a clear space of daylight available, we may dispense with the reflector, but we shall find it safer to use a screen of fine and clear ground glass, this glass to be fitted up a quarter inch or so in front of the negative to be enlarged. Provision is made in some outfits for this ground-glass screen, otherwise it can be attached in various ways without much trouble.

In the mean time some part of our baseboard must be firmly attached to the table. *What* to use in order to fix things must be decided on the spot by the shape and form of the baseboard. A small collection of bolts and screws, and two or three clamps, such as used for small sewing machines, are useful, and one or other will generally come in handy for the purpose.

It is now time to understand something of the formula regulating the principle of enlarging, so as to be able to adjust our apparatus, *i.e.*, the frame holding the negative, the frame holding the lens, and the frame holding the dark slide, at approximately correct positions from each other without resorting to the ground-glass focus screen.

If practicable, and it is sometimes done by the makers, the baseboard frame should be marked off into inches for convenience of registering a focus.

Firstly, consider and select the lens for use in the operation of enlarging. It has been said that a single lens—an achromatic meniscus—is the best to use. There is, no doubt, good work to be done with a single lens; but, as a matter of fact, in practice there are disadvantages—serious disadvantages, in my opinion—viz., that we have to stop down considerably in order to get a sharp image, and the flood of light is minimised thereby to such an extent that the operation of focussing is made a labour; the time which has to be given when exposing the sensitive material is also increased, and failures from under-exposure may be looked for.

Apart from the question of cheapness, and this only in a minor degree, everything is in favour of the rectilinear lens. This form of lens will be found to cover better; we get better definition; it lets in a large amount of light, and, although we have to use a diaphragm, the lens need not be stopped down to the same extent as a single lens; and, finally, it will be all round quicker in action.

The rapid-rectilinear form of lens is now universally employed in all branches of photography; their price is, in the case of small lenses, much below what, in years gone by, similar lenses could be bought. One can afford a separate lens for each branch of work; but, if this be not done, it will be advisable to have two or three extra flanges, so as to save unscrewing the lens every time a change is made.

The lens should not be a big one of long focus. The rule is, if we enlarge half-plates, negatives whose greater length is six and a

* Concluded from page 8.

half inches, to use a rectilinear of somewhat similar focus—six to eight inches. It comes to this, then, that the rectilinear with which the negative was taken will, as a rule, be best adapted for enlarging it.

With a short-focus lens, the length of camera bellows or extension will be kept within reasonable limits; and here we may mention the rule which applies to all enlarging operations. Having ascertained the equivalent focus of our lens—and this is usually a matter of common knowledge—six, eight, or ten inches, or so, as the case may be, we can very easily calculate the distances where, in the one place, the negative is to be put, and in the other how far back the dark-slide frame must be brought.

We know at once two facts: first, that our rectilinear is eight-inches focus; secondly, that our enlargement is to be two or more diameters. Now, to avoid a lot of unnecessary calculation, we may say roughly that, if we are enlarging a half-plate to 12×10, the enlargement is two diameters. So far, therefore, we have 8 as the focus of lens, and 2 as the degree of enlargement. Where, then, are we to place the frame holding the negative, and where the dark-slide frame?

To find the distance at which the negative frame is to be put in front of the lens, under these data, divide the equivalent focus, 8, by the degree of enlargement, 2, and add the product to the focus of lens, as—

$$8 \div 2 = 4 : 4 + 8 = 12 \text{ inches.}$$

To find the distance back to which the dark-slide frame is to be brought, add 1 to the degree of enlargement, and multiply the result by the equivalent focus of lens, as

$$1+2=3 : 3 \times 8=24 \text{ inches.}$$

We therefore interpose a space of twelve inches between lens and negative, and twenty-four inches back between lens and dark-slide or focussing frame. This being done, we can easily and leisurely focus accurately, using a large velvet cloth. Any errors in this direction will be the result of not measuring the distances correctly; but, in any case, having got a rough focus by measurement, it will be an easy matter to get the image sharp on the screen.

The baseboard being measured off enables you to place the three frames in position without loss of time, and more attention can thus be paid to accurate focussing and careful lighting of the enlarged image.

A spare half hour may well be devoted to these little necessary calculations, committing the formula to memory, and then making (on the screen) various enlargements. It is not always necessary or desirable to enlarge the whole of the negative; possibly only one small bit. This, I have said, may very conveniently be surrounded with a mask. We then measure the piece to be magnified, say, four inches across. This, enlarged on to a 12×10 screen, means three diameters. Therefore, using the eight-inch lens, the distances will be $10\frac{2}{3}$ and 32 inches respectively.

Now, if we compare the above distances with those which would be necessary if using a lens of ten-inch focus, we shall see what a saving there will be in space, length of bellows, &c.

Lens focus, 10 inches; enlargement, 3 diameters:—

$$10 \div 3 = 3\tfrac{1}{3} : 3\tfrac{1}{3} + 10 = 13\tfrac{1}{3}$$
$$3+1=4 \ : \ 4 \times 10 = 40$$

We should require, therefore, for the same enlargement eight inches more of bellows at the back, and in all fully fifty-four inches, instead of forty-three inches. In amateur practice, and where the apparatus is only in occasional use, we shall find any saving as regards bulk a greater matter than appears on the surface. If we work with large, bulky, and lengthy cameras—anything, in fact, over 15×12, or longer than fifty-four inches—it is almost a necessity that they be fitted with rack-work or screw, in order to ensure a workable apparatus.

To return, however, to our present subject, I may remark that a small assortment of rectilinear lenses of varying foci will be found very useful indeed. If our length of bellows won't admit of the use of our ten, or even eight-inch focus rectilinear (this depending upon the degree of amplification), then we can change to a six-inch, or a five-inch. The short-focus stereoscopic rectilinear and portrait combinations, or the wide-angle rectilinears, make very good copying and enlarging lenses, keeping the whole arrangement of apparatus within reasonable and practicable measurements.

Thus far I have spoken of negatives only, as for direct enlargement on to bromide paper; but, as a matter of fact, we need not, with our apparatus, confine ourselves to this form only. Good positive photographs make excellent enlargements by direct copying, and I may finish this article by reminding the beginner that, with due regard to lighting, which must be correct and *even*, the same rules already given equally apply. Our eight-inch lens will enlarge and copy straight on to a sensitive plate measuring 12×10 inches a print six inches across, the print being erected and fixed twelve inches in front of the lens, and the dark slide and screen brought back to a distance of twenty-four inches. This method of enlarging has many advantages, but leads to a subject which I must refer to later on. J. PIKE.

MECHANICAL DEVELOPMENT.

[Photographic Society of Philadelphia.]

ONE of the first desires felt by those who take up photography to the extent of developing the negative as well as pressing the button is that some way might be devised of holding back the development of the high lights while the details in the shadows are being built up. In developing, one of two plans is usually followed. The one consists of mixing the developer in certain proportions, and then using it for all plates indiscrimnately, while the other plan is to manipulate the developer to suit the requirements of the particular plate being developed.

The first method is based on luck, and the results are good or bad according to whether the mixture happens to suit the plate and exposure or not. The usual directions regarding the latter mode of developing are that a weaker developer than normal shall be used as a base, and to it shall be added old developer or bromide to restrain, pyro or eikonogen to give strength and density, and an alkali to bring out detail, as it is found the character of the plate demands from its being either undetermined, just right, or over-timed.

The principal objection to this method, however, is that after a half-dozen plates have been developed, requiring varying additions of different chemicals to make up for different exposures, the product in the developing dish is like hotel hash—full of useful ingredients, but in what proportions no one but an analytical chemist can determine.

Without a doubt, more plates are under-timed than over-timed, due to the fact that the shutter must be speeded to a quicker movement than that of the object taken. This is especially true of scenery when the wind gives motion to the foliage in the foreground, of large groups, and snap-shots in general, especially those taken of children and babies. The light in rapid out door portraiture, when weak enough to allow a natural expression about the eyes, is usually too weak to give much detail in the shadows. The matter is further complicated when a portion of the plate is over-exposed and another portion under-exposed.

When a plate is under-exposed, and less pyro and more alkali is added to bring out the detail, it frequently occurs that the details which show in the developing dish either partially or altogether disappear in the fixing bath, leaving only a slight trace on the film. This is due to the fact that the reduction made in the amount of pyro for the purpose of giving less density to the high lights causes an absence of real strength in the detail in the shadow. For more than a year I have found that much better results can be obtained in developing plates by adopting the following method:—

The exposed plates when taken from the holder are immersed in cold water in winter and in ice water in summer, where they are allowed to remain for three or four minutes, until the film and glass are chilled. The developer is prepared on the basis of normal exposure, and, if made from powders, is mixed with ice water, or, if in fluid form, is submerged in a thin glass bottle or vessel in ice water, until it is much cooler than ordinarily used. When the plate is placed in the developer, the action is restrained by the cold developer, so that, in event of an over-exposed plate being immersed, the same result is obtained as by the use of bromide or other restrainer. If the plate has received either a normal or under-exposure, the high lights will first appear slowly, and the moment they begin to shown the plate should be lifted horizontally out of the developer and allowed to rest on the two edges of the tray, so that the plate will be in a horizontal position, thus preventing the flow of the thin layer of developer in any direction, or, better still, in an empty tray with ribbed bottom. The plate should be allowed to rest in this position until the point is reached where it would otherwise begin to dry on the surface, when it should be immersed for a moment and again placed in the same position. This should be repeated until all the detail is developed, when the plate can be placed for a short time in the developer for a general increase in density. The only precaution necessary to be observed is to have sufficient developer in the tray to immediately cover the negative, which should be immersed by lowering it from one end, thereby allowing the developer to sweep over it. It is well to pass a swab of absorbent cotton over the face of the negative when in the developer, to remove any air bubbles or foreign substance. By this method of manipulating the plate it is possible to force out the details of the shadows without making the high lights too dense. Attention has been called in the past to the value of exposing the plates to the air during the process of development, on account of the increased action of the developer, due to the oxygen of the air; but this will not explain the fact that, under this process, the high lights are restrained and the details in the shadows built up. When the plate is raised from the developing fluid, there is immediately overlying all portions of the negative a very thin film of developer. Where the high lights underlie the developer a rapid chemical action is at once

started, and the strength of the developer exhausted. Where shadows underlie the developer the action is slow, and the developer exerts its full strength on the slight impression made by the light. The entire plate is subject to the action of the developer, which is exhausted at different points, proportionately to the action of the light on such points during the exposure of the negative in the camera. On this account it is only possible for the high lights to be affected to the extent of the energy in the developer immediately overlying such high light, while the shadows are practically subject to the continued action of the full strength of the developer.

If, for the sake of illustrating the method, it is admitted that the energy of the developer overlying the high lights is exhausted in, say, one-third of the time the plate is out of the developer, then the result is equivalent to giving the shadows three times the effect of the developer as compared with the high lights.

In developing plates, over-exposed in some parts and under-exposed in others, good negatives can be obtained by developing one part or the other to a normal condition, and, after fixing and drying, coating the portion of the plate which is satisfactory with Carbutt's roxyline, and then reduce or intensify the balance of the plate, the coated portion being unaffected during the process. The roxyline can be applied around the edge of portion to be covered with a camel's-hair brush and balance covered by flowing the preparation. In instantaneous views of scenery, it sometimes happens that the faces of those who may be introduced to give the picture life are too much on the brunette style to suit either the subject or the photographer. By coating all the plate except the faces, they can be improved by intensification.

The natural tendency of keeping the plate so much in the air is, especially in summer, to raise the temperature, which decreases the crispness of the image. By keeping the development cold this is corrected. A piece of pasteboard placed between the developing dish and a ruby lamp prevents any trouble from fog. Another advantage in this form of developing is that two plates can be developed at the same time with little difficulty, as one or the other of them can be kept out of the developer. Other parties who have tried this method have found it to work satisfactorily. In developing outdoor portraiture, it prevents chalkiness in the high lights, while trying to build up the details of the shadows, and gives a smoothness and roundness to the arms and face that it seems otherwise impossible to obtain. Another great advantage in this method is that the developer, except that its energy has been reduced, is the same when the last plate is developed as when the first was put in, there being nothing added in the mean time to unsettle the proportions. By adopting this plan, it is unnecessary to add either bromide or old developer as a restrainer.

In conclusion, let me suggest, if any one has a doubt as to its efficacy try it when again developing instantaneous exposures. F. S. Lewis.

Our Editorial Table.

The Queen Films.

Austin Edwards, Willoughby-lane, Park, Tottenham, N.

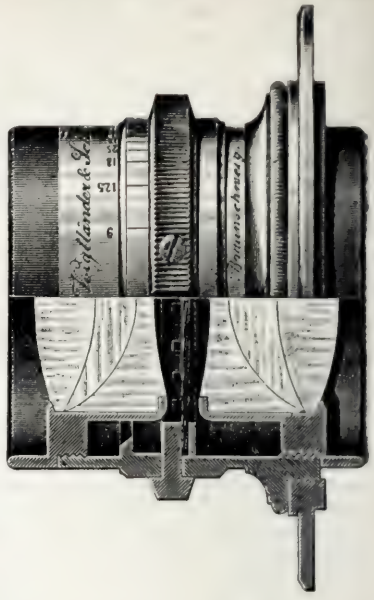
Of the Queen films (and plates) Mr. Edwards makes a rapidity, called the "Double Instantaneous," which, he has for sometime claimed, possesses the highest possible speed, with no tendency to fog. We recently submitted samples of his latest make of films to experimental use in the camera, and, working in a dull light late in the afternoon, at *f*-11, secured, with normal development, negatives of an interior, which, under the circumstances, attested in a marked manner the highly sensitive nature of the emulsion. Desirous of testing the accuracy of the other claim—the fog-resisting property of the film—we found that, even by largely increasing the strength of the developer and omitting bromide, the films remained wonderfully clear and free of veil. We have no hesitation, therefore, in saying that, in the "Double Instantaneous" emulsion, Mr. Austin Edwards, the youngest of our plate and film makers, has produced a preparation of great excellence, entitled in every degree to be considered as combining the desirable qualities of the highest rapidity and lack of tendency to fog in development.

A New Lens.

We have received from Messrs. Marion & Co., Soho-square, a descriptive pamphlet of the new lens by Voigtländer & Son, for whom Marion & Co. are sole agents. On glancing over the pages we learn that the "Collinear" is a symmetrical double combination, each cemented compound composed of three elements differing in form from others, and working with a very large aperture, as shown in the cut.

After reciting the investigations and manufactures of Messrs. Voigtländer, the pamphlet goes on to say:—

"Nevertheless, among the unequalled selection of lenses which Messrs. Voigtländer & Son were thus enabled to offer to photographers, there was still wanting a lens of, so to speak, universal application—a lens combining great power of light with a wide, flat, anastigmatic image field, and which, moreover, should be symmetrical, so as to admit, at the same time, of the use of a single lens as a landscape lens.



"After many theoretical considerations, and a systematic study of the technical material available, and of all possible forms of construction, we have succeeded in producing such a symmetrical double lens, consisting of two equal, tripartite cemented halves, which will satisfy the most exacting requirements as to the anastigmatic flatness of image, large range of vision, and intensity of light. This aim was attained by a way entirely different from any hitherto taken, as the new lens is not, like the anastigmatic, composed of normal and abnormal glass couples, nor can it be decomposed into such couples as the double anastigmatics. On the contrary, on arbitrarily decomposing one of the tripartite cemented halves, we should obtain but *one* definite couple, viz., the normal pair, while the place of the abnormal pair, composed of a positive and a negative lens, is taken by a couple of positive lenses.

"The performance of this new lens, according to the opinions which have hitherto come to hand, is described to us, unanimously, as being extraordinary, because by its means an almost absolutely geometrical (collinear) picture is obtained. This is the reason why we have called it "Collinear."

We have seen one of the "Collinears," without, however, having tried it, and it is an exceedingly fine specimen of high-class mechanical work. If it is found to fulfil all that has been said of it, then will it prove a boon to photographers.

News and Notes.

Royal Photographic Society.—Technical Meeting, January 22, at 50, Great Russell-street, at eight p.m. *Control over Results in Development*, by Alfred Watkins.

Mr. J. R. Gotz informs us that he is relinquishing the lease of 150, Shaftesbury-avenue, and that his surplus stock of apparatus is for sale. Doubtless many bargains are to be secured.

Autotype Platinum Paper.—With the new year the Autotype Company are adding a fresh department to their business, and have organized a complete installation for the manufacture of platinum paper. The paper will be packed in sealed tin tubes, with full directions for use. Each batch will be carefully tested before sending out.

It is proposed to form a Photographic Society in Bradford. A meeting was held in furtherance of this object at St. George's Hall Coffee Tavern, on Thursday, January 17, at eight p.m., to discuss the matter. Mr. Walter Booth, 31, Thornton-road, or Mr. James Tindell, New Kirkgate, will be glad to give any further information or to receive names of any one unable to attend the meeting.

The Durham City Camera Club's Third Exhibition of Photographs will be held in the Shakespeare Hall, North-road, Durham, on Tuesday, February 26, 1895. The following is the prize list for open competition:—Class A: Landscapes or Seascapes (any size or process), silver and bronze medals, given by Alderman M. Fowler, M.P. Class B: Any Subject, other than Class A, (any size or process), silver and bronze medals, given by "A Friend of the Club." Class C: Set of Six Lantern Slides, silver and bronze medals, given by the Mayor of Durham (Councillor E. Jepson, M.D.). The entries close on February 16, 1895. Entry forms and any further information may be obtained from Mr. R. Hauxwell, Hon. Secretary, The Avenue, Durham.

The Brixton and Clapham Camera Club's Fifth Annual Exhibition will be held at Brixton Hall, Acre-lane, Brixton, S.W., on Tuesday, Wednesday, Thursday, Friday and Saturday, March 26 to 30, 1895. The following are the Open Classes:—(C) Pictures (not medalled previous to March 9, 1895); (D) Lantern Slides (not medalled previous to March 9, 1895). One silver and two bronze medals are offered in each class at the discretion of the Judges. The Judges will have power to award certificates of honourable mention in all classes. The Judges will be Mr. F. C. Cembrano, jun., Colonel J. Gale, and Mr. Andrew Pringle, F.R.M.S. Intending exhibitors of apparatus may obtain full particulars on application to the Hon. Secretary, of whom entry forms and further information may also be had. His address is Mr. Fred W. Levett, 11, Corrance-road, Acre-lane, S.W.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 38.—"Improvements in and relating to Optical Lanterns." A. HUGHES.—*Dated January*, 1895.

No. 96.—"Improvements in Photographic Cameras." H. F. CHRISTIE.—*Dated January*, 1895.

No. 218.—"Improvements in or relating to Photographic Cameras." C. W. FORWARD and C. E. COLE.—*Dated January*, 1895.

No. 227.—"An Improved Hood or Cover for View-finders for Photographic Cameras." A. C. JACKSON.—*Dated January*, 1895.

No. 299.—"An Improved Photographic Printing Frame." W. A. EDWARDS.—*Dated January*, 1895.

No. 420.—"Improved form of Photographic Plate-holder and Camera for same." B. ACRES.—*Dated January*, 1894.

No. 446.—"Improvements in or relating to Photographic Cameras." C. C. VEVERS.—*Dated January*, 1895.

No. 462.—"Diaphragms for Photographic Lens Tubes." Complete specification. M. LEVY.—*Dated January*, 1895.

No. 496.—"Improvements in and connected with Photographic Cameras.' F. I. RICARDE-SEAVER and L. PERNOT.—*Dated January*, 1895.

No. 613.—"Improvements in Photographic Cameras and the like." F. H. SANDERSON.—*Dated January*, 1895.

No. 752.—"Improvements in and relating to Photographic Cameras." Communicated by C. Conquérant. H. H. LAKE.—*Dated January*, 1895.

PATENTS COMPLETED.

IMPROVEMENTS IN LANTERN MICROSCOPES.

No. 158. WILLIAM GREENWOOD, North-street, Cheetham, Manchester, and ROUGHSEDGE WALLWORK, Union Bridge Iron Works, Rogers-street, Manchester, Lancashire.—*December* 8, 1894.

OUR improvements in lantern microscopes consist in dispensing with the large condensers of four and five inches diameter, and arranging the lantern microscope so that it can be instantly changed from one power to another without further adjustment.

To accomplish this object we arrange two lenses mounted together of about three-inch focus, and about one and a half inch in diameter. These we arrange about one and a half inch from the light. This distance from the light depends upon the exact focus of the lenses.

This arrangement gives an approximately parallel beam of light one and a half inch in diameter.

We now arrange the remaining part of the instrument upon a sliding stage, which can be moved as desired to allow of any other piece of apparatus being placed in the parallel beam of light—as an example, the alum trough, or tank, which, by our arrangement, does not interfere with the light to any perceptible extent, as is the case with the converging or diverging rays as generally used.

We arrange the substage condensers and objectives upon a revolving spindle held in suitable fixings upon the sliding stage, and we so arrange them that, when once adjusted to each other, no further adjustment is necessary, each objective having its own substage condenser. We arrange upon the revolving spindle the necessary discs to carry two or more of each.

The focussing is arranged in such a manner by a second slide upon the main stage, by the necessary screws or racks, that it does not interfere with the adjustment of the substage condensers and objectives.

When required, we also arrange amplifiers upon the same spindle, so that they are also instantly adjusted.

In describing our improvements, we have referred to mounting our substage condensers and objectives upon a revolving spindle. We do this as being in our opinion the simplest form, but we do not limit ourselves to this particular a rangement.

We, in some cases, mount them upon a segment of a circle, and we can also arrange them to move in a parallel slide. The arrangement described is very simple, and one that can easily be understood.

We also arrange the stage in some cases upon which the objects to be shown are fixed so that this also can be revolved, and make same to hold one or more objects as desired.

In combination with our improvements, we use the ordinary lime light, or electric light.

The claims are:—1. In lantern microscopes, the arrangement of mounting several object lenses of different powers with their respective condensers upon jointly revolving or moving discs, sectors, or slides, or their equivalents, in such a manner that the foci of the different object lenses are in the same plane parallel to said discs, sectors, or slides, substantially as hereinbefore described, and illustrated by the drawings, and for the purposes set forth. 2. In lantern microscopes, the combined arrangement of lenses for deflecting the light from the lamp into parallel rays, and a sliding frame carrying several object lenses of different power and appropriate condensers mounted on jointly revolving or moving discs, sectors, slides, or their equivalents, substantially as hereinbefore described. 3. In lantern microscopes having several object lenses and condensers of different powers mounted on jointly revolving discs, sectors, or slides, and adjusted so that the foci of the different object lenses are in a plane parallel to said discs, sectors or slides, the arrangement of multiple object-holders correspondingly as discs, sectors, or slides parallel to the former and adjustable in distance from the same, substantially as described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
21	Camera Club	Question-box opened.—Lantern Evening.
21	Glasgow and West of Scotland	
21	Leeds Photo. Society	
21	North Middlesex	
21	Richmond	Open Discussion.
21	South London	*Photo-micrography, or the Delineation of "The Infinitely Little."* C. H. Oakden.
22	Birmingham Photo. Society	Lantern Evening.
22	Bournemouth	Informal Meeting.
22	Brixton and Clapham	*Animal Photography.* J. O. Grant.
22	Hackney	*Preparing Negatives for Printing, Reduction, Intensification, &c.* M. Auty.
22	Newcastle-on-Tyne & N. Counties	
22	Paisley	
22	Royal Photographic Society	*Control over Results in Development.* Alfred Watkins.
23	Croydon Camera Club	Final Selection of Members' Slides for Display on the 30th.
23	Leytonstone	
23	Midland	*Simple Chemical Analysis of Photographic Materials.* R. J. Bailey.
23	Photographic Club	*A Talk about Light.* Birt Acres, F.R.Met.S.
23	Stockport	
24	Camera Club	*Some Phenomena and Illusions of the Eye.* Eric S. Bruce.
24	Ealing	*Reducing by Electric Light.* A. Richardson.
24	Glossop Dale	
24	Hull	
24	Ireland	*Innocents Abroad (with Cameras).* V. E. Smyth and J. R. Brown.
24	Liverpool Amateur	*Bromide Printing.* Mr. Anyon.
24	London and Provincial	*Photo-micrography.* T. E. Freshwater.
24	Oldham	
24	West London	*Home-made Printing Paper.* James Stein.
24	Woolwich Photo. Society	*Hand-camera Work.* Walter D. Welford.
25	Cardiff	
25	Croydon Microscopical	*On the Influence of Orthochromatic Plates and Yellow Screens on Colour Values.* J. H. Baldock, F.C.S.
25	Halifax Camera Club	*A Run in Norway and the Ardennes.* J. I. Learoyd.
25	Holborn	
25	Maidstone	
25	Swansea	
26	Hull	
26	Southport	Prize Slides.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 10,—Mr. William Coles in the chair.

Mr. G. W. Atkins showed some solid dark slides with very thin steel draw-out shutters.

Mr. J. E. HODD mentioned that he had had films partly leave their supports when finished and put away, and the remainder could not be depended upon to strip.

Mr. R. BECKETT had found the same defect, but was able to separate the whole film.

Mr. W. E. DEBENHAM proposed alcohol as a means of completing the separation.

Mr. L. MEDLAND had films leave the support before exposure.

It being the usual Lantern Evening, Mr. J. S. Teape showed the collodio-chloride slides on the screen which he had brought up at his demonstration last week.

Mr. S. J. Beckett showed his collection of Italian views, comprising scenes and buildings in Rome, Venice, Naples, &c., remains of Pompeii, the temples at Pæstum, figure sketches, and Vesuvius, including a peep into the crater.

Mr. BECKETT described the pictures, and was thanked for the exhibition.

The HON. SECRETARY made some remarks, asking the members to propose subjects for discussion at the Committee of the Affiliated Societies, of which he is the Association's delegate. This was agreed to remain over to another meeting.

PHOTOGRAPHIC CLUB.

JANUARY 9,—Mr. S. H. Fry in the chair.

M. Calmels handed round for acceptance pulls from the half-tone plate he had etched at the previous meeting.

Mr. S. T. Chang showed a series of slides, chiefly of ladies swimming, &c.

MANCHESTER PHOTOGRAPHIC SOCIETY.

JANUARY 10,—Mr. Thomas Chilton in the chair.

Mr. H. M. WHITEFIELD exhibited and practically demonstrated the working of the new injector lantern jet, explaining the principle by which oxygen at a high pressure from a cylinder is injected through a fine aperture into a tube near the chamber of the jet, to which coal gas is supplied at the low ordinary pressure of the Corporation mains. The oxygen sucked in sufficient coal gas, and the result was practically the same as a good mixed jet, the light being superior to many mixed jets. The injector jet is perfectly safe in use; the indrawing of the oxygen was manifested by holding a lighted taper at the supply tap, to which the coal-gas tube is generally attached, when it was distinctly seen that the flame was sucked into the coal gas-tube, proving that no oxygen could pass back into the

house mains. The jet makes a slight noise when sufficient pressure is applied to obtain a first-class light. That difficulty will be avoided in a modified pattern of inlet, shortly to be introduced; but there is no noise whatever when the injector jet yields a light equal to a good "blow-through," or moderate mixed jet, and there is the additional advantage of the light emanating from a brilliant spot instead of from the ring, with a dark centre usually found on the line with the "blow-through" pattern of jet.

Mr. Whitefield expressed the opinion that the new jet, when offered at a somewhat less price than at present, will entirely abolish "blow-through" jets, and practically supersede the ordinary mixed jet.

The colour of the light is much superior to the "blow-through," being the same as mixed-jet illumination.

The subject of stereoscopic photography was next introduced by Mr. JAMES WOOD, who read a paper setting forth the pleasure and general satisfaction to be derived from this method of picture-making. Blackboard sketches were introduced to elucidate the action of lenses as aids to stereoscopic vision.

Some of the points mentioned by Mr. Wood were contested in an animated discussion which followed the reading of the paper, in which Messrs. Whitefield, Edwards, Blakeley, Peddie, Smith, and the Chairman took part.

Ealing Photographic Society.—January 10, Mr. H. W. Peal in the chair.—A large number of members were present. Minutes of previous meeting were read and confirmed, and the meeting adjourned to the dark room, where Mr. A. RICHARDSON gave a demonstration of *Enlarging*. Much interest was shown, as this was the opening night of the new lantern, or, rather, of the old lantern with its recent improvements, it being now fitted with the 1000 candle-power Davy arc lamps, which are most satisfactory, there being an almost entire absence of vibration and the light being exceedingly steady. The direct light is not used, only *reflected* light, and by this means a very even illumination is secured. The lantern is one made from the designs of one of our members, Mr. Charles Whiting. Mr. Richardson, having explained the working of the apparatus, proceeded to give a practical demonstration of its usefulness by enlarging from half-plate to about 20×17 rapid bromide paper, *f*·16, rapid rectilinear lens, thirty seconds exposure. This was developed with amidol. A quarter-plate positive was next enlarged to 12×10, a photo-mechanical plate being used, with the same stop and lens. Exposure, eight seconds, developed with hydroquinone; and next a half-plate was enlarged to a size of something over four feet by three feet. Only a portion, about 20×18 inches, of this was used, the exposure, with same lens and stop, rapid bromide paper, amidol developer, being four minutes. All these turned out exceedingly well, the plate being the least successful, as it is a little thin in the sky, but still it is a very good printing negative. Questions *re* the working of the apparatus were freely asked and answered, and the meeting closed with a vote of thanks to Mr. Richardson. The lantern is now open for the use of members. A Council meeting was held after to consider the correspondence received from America *re* Mr. Eickemeyer's pictures, and the decision arrived at was that Mr. Eickemeyer is *not* entitled to receive the medal awarded to him by the Judges at our Exhibition for his *own work*.

Hackney Photographic Society.—January 8, Mr. R. Beckett presiding.—Members' work was shown by Messrs. Hensler and Gosling. In reply to Mr. WILKS, who inquired whether good results could be obtained on Alpha paper with platinum toning, Mr. GRANT thought it to be unnecessary. The CHAIRMAN concurred, and said that all possible tones were to be obtained with gold. Mr. S. J. BECKETT had tried the process to a limited extent by well washing the Alpha paper after developing, and then toning in the ordinary platinum bath as used for gelatino-chloride paper. The results were not satisfactory, the toning taking twenty times as long, and the resulting tones being in no way different to those obtained by using gold. Mr. J. CARPENTER then read a paper on *Mezzotype*, detailing his experience therewith, and afterwards demonstrating the platinum toning bath with the paper in question. He said that this paper seemed eminently suited to rendering certain artistic effects. Negatives of rather strong contrasts, such as those obtained with pyro and ammonia, with a slight yellow stain, appeared to be the most suitable to use. The printing should not be carried too deeply, as, with the exception when using the palladium bath, very little was lost in toning and fixing. Of the baths recommended by the makers, Mr. Carpenter preferred, for a sepia tone, that one composed of hypo and gold as follows: Solution of gold chloride (15 grains to 1 ounce water), 20 drops; hypo, 1 ounce; water, to 10 ounces. Next in order he preferred the platinum bath. A good range of colours might be obtained from the latter by altering the length of time of toning. For reddish brown the print should be removed as soon as it began to change colour; slightly longer toning would give deep brown; longer still would produce purple or purplish brown; and a continuance in the bath would produce warm black. The palladium bath Mr. Carpenter found to be least satisfactory. As it had a reducing tendency, the prints had to be considerably over-printed. Thorough fixing was very essential, or stains would appear. The use of a supplementary fixing bath was advisable as a safeguard. At least two hours' washing in running or constantly changed water was necessary, after which the prints might be dried by suspension or by placing between blotting-paper.

Richmond Camera Club.—On December 31, Mr. Cembrano presiding, Mr. ENNIS read a paper on *Development*. He explained the theory, and, confining his remarks chiefly to pyro-ammonia as the agent, gave practical instructions how to work, what to do and what to avoid, how to treat over, under, and doubtfully exposed negatives, and illustrated his remarks by showing specimens of apparatus and negatives.

South London Photographic Society.—January 7, Mr. F. W. Edwards in the chair.—This being the first meeting in the New Year, a Ladies' Lantern Evening was held. Mrs. Catharine Weed Ward attended, and exhibited a large number of slides, illustrating scenes at the Photographic Convention at Edinburgh and Dublin, views in the Peak District, Stratford-on-Avon, and the neighbourhood, and in America, specimens of home portraiture, and studies of scenes in *Cinderella*, *Elaine*, &c.

West London Photographic Society.—January 10.—Mr. W. H. WHITEAR read a paper on *Chiswick: Past and Present*. Starting with the ancient history of the parish, he passed quickly through the Middle Ages, and came to the times of Good Queen Bess and King James, and took his audience through the Commonwealth to the present time, introducing ancient ratepayers or residenters, among whom were the fiery Prince Rupert, Pope the elder, Charles James Fox, the Earl of Burlington, Foscolloe, Joe Miller, and Hogarth, &c. The paper was illustrated by a fine set of slides, including copies of old maps, portraits, and views of places now covered by the bricks and mortar of the omniverous jerry-builder, but still showing to the careful student some marks of their ancient calling, as well as of the district in its present condition. Special note must be made of the fine set of Devonshire (formerly Burlington) House and grounds. The paper showed how thoroughly Mr. Whitear had carried out the work of the record or survey in this district, and was fittingly closed by a copy of Hogarth's *Finis*.

Woolwich Photographic Society.—January 10,—The chair was occupied by Mr. Harold H. Barker.—The CHAIRMAN, in cordial terms, introduced Mr. W. H. BARNES to the meeting, who proceeded to give a lecture and demonstration on *Lantern-slide Making by Reduction and Contact*, with special reference to the use of Edwards's transparency plates. As Mr. Barnes described it, it was an instruction night, and, after a full explanation of the process, the lecturer proceeded to expose and develop plates in order to show the effect of altering the direction of exposure and the difference in tone by using pyro and ammonia, hydroquinone, and amidol.

Birmingham Photographic Society.—The following are extracts from the report for the year 1894:—With its various phases of success in these past tee years, the Society has never presented a more flourishing aspect in every way than at the present moment. This is in no small degree due to the timely change of abode which your Council has been able to effect. After the resolution passed at the last annual meeting, in January 1894, to the effect that it was desirable to have new rooms, your Council took energetic steps to carry out your wishes, and the excellent rooms in Stephenson-place, to which we removed at Michaelmas, have been obtained after most exhaustive inquiries, extending over some six months, in nearly every available portion of the city. There are twenty-eight distinct suites of rooms which have been inspected, and reported upon the minutes of the Council, not to mention a host of more or less unsuitable places resulting from a general appeal to members and advertisements in the daily papers. The Exchange-rooms, your Council venture to think, meet the requirements of the Society in nearly every respect, and have been secured upon such terms as may be met without any increase in the present subscription. The lecture and reading-room is shared with the Birmingham Architectural Association, who hold meetings on Friday evenings, and is open to members at all other times, unless notice to the contrary is given in the current programme. The private or committee-room contains the library and other property, and is available at all times. A dark room is provided for changing plates, and the key will be found on the notice board in the private room, where it is requested it will be returned after use. The whole of the property, including lantern, &c., is now stored upon the premises occupied by the Society. The Council is much indebted to Mr. G. A Thomason for kindly taking charge of the various articles for several years. The average attendance at meetings held at the Colonnade to September was about fifteen. At the Exchange-rooms it has been about forty, and there is every prospect of still further increase and greater sociability, for which every opportunity prevails. The pictures belonging to the Society have been rehung in our new quarters, but, with the additional wall space now at our disposal, there is scope for a further display, and your Council will be glad to receive pictures of interest for exhibition either temporarily or permanently. With this object in view, a series of monthly exhibits of members' work has been arranged, by which prints, transparencies, and lantern slides will be on view for a calendar month, and be renewed at the end of that period. The exhibits for November and December were of good quality, and the scheme, to which all members are invited to contribute, promises success. The large room at the Y. M. C. A. has again been retained for open lantern exhibitions, and the admirable entertainments by our President (Sir J. B Stone), upon two occasions, together with those of Drs. Duncalfe and Tunstall, Messrs. F. W. W. Howell and H. W. Hughes, have well maintained the popularity of these evenings, when there has been a very large attendance upon each occasion. Your Council hopes to arrange for one such popular lecture each month during the winter season. The papers and demonstrations have been of a practical and instructive nature. The series for beginners has been much appreciated, and it is hoped to continue this through the season for the benefit of the numerous newly joined members. Twenty-one new members have been added to the roll during the year. In spite of increased expenditure in many directions, cost of removal, fittings, &c., it is gratifying to be again able to report that the finances are in a satisfactory condition. The Crystal Palace Exhibition was not held this year, so that there has been no opportunity of competing for the National Challenge Cup. This has to be gained only once more to become our own property. The Photographic Convention of the United Kingdom, held in Birmingham in 1888, resulted in a serious financial deficit, which was met by subscription, chiefly among members of the Society who had participated in the work, there being at the time insufficient funds belonging to the Convention to defray the cost. Last year, it may be remembered, a sum of 5*l*. 19*s*. 11*d*. (being 10*l*. less certain expenses to be paid) was received on account of this deficit from the Council of the Convention, who have now kindly remitted the balance of 18*l*. 15*s*. 1*d*. through Mr. Pickard. Most of the subscribers have been approached as to their desire to have their donations returned, but in no case has this been required, so that the whole amount has been handed to the Society. A sum of three guineas from this money has been voted to a testimonial fund to Mr. F. P. Cembrano, the Convention Hon. Secretary, who chiefly has been instrumental in so satisfactorily clearing up the matter, and the remaining portion, it is proposed, shall furnish the nucleus of a reserve fund, which would place the Society in a strong financial position. We are indebted to the Council of the Convention for the remittance, and to the original subscribers for allowing the money to be added to our funds.

Derby Photographic Society.—January 13, Mr. G. Walker presiding.—Several vacancies having occurred amongst the officers of the Society, the following gentlemen were duly elected:—*Vice-President:* Mr. George Walker.—*Hon. Treasurer:* Mr. F. H. Gandy.—*Delegates to the Royal Photographic Society of Great Britain:* Messrs. T. A. Scotton (Hon. Secretary) and W. H. Glen.—*Committee:* (in place of Mr. G. Walker) Mr. E. Fearn. The Hon. Secretary submitted the annual balance-sheet, which showed the Society to be in a very prosperous condition, there being a balance in the bank of 7*l.* 19*s.* 9*d.* The annual report was then read, the only complaint being the lack of interest taken in the out-door meetings. In connexion with this, however, a competition was held, and some good work was sent in, Mr. James Fleet securing the silver medal, and Mr. E. Fearn the bronze medal. Mr. Wm. England, of London, acted as judge. Mr. W. Glen, in a few remarks, said that he should not like the meeting to terminate without proposing a vote of thanks to the Hon. Secretary. He no doubt had had a very uphill course before him when taking the post some four years previously, and, in his opinion, most of the present success of the Society was due to the energetic way in which Mr. Scotton had fulfilled his duties. Mr. F. H. Gandy seconded, and said, although a young member, he had come into contact with Mr. Scotton a great deal, and could fully endorse Mr. Glen's remarks. It was decided to hold an Exhibition at Smith's Restaurant from March 9 to 16, to be open to members and any friends they might like to take part.

Fairfield Camera Club.—January 9, Mr. A. Vos (President) in the chair.—The competition medals for the year 1894, and won by Messrs. Holt, Wilson, and Spence, were presented at this meeting. Afterwards followed a lantern lecture by Dr. Ellis on *Through Shropshire and South Wales*, which was listened to by a most appreciative audience, the lecturer showing great ability on all parts of his subject—architectural, historical, antiquarian, and photographical.

Leicester and Leicestershire Photographic Society.—January 10, Mr. Porritt (President) in the chair.—The reports of the Hon. Secretary and Hon. Treasurer were read and adopted, and thanks were voted to the President and officers for their services during the past year. The following were elected to serve for the ensuing year, viz., *President:* Mr. S. Squire.—*Vice-President:* Mr. R. R. Blackwell.—*Committee:* Messrs. Porrit, Toone, Blankart, Hubbard, and Howard.—*Treasurer:* Mr. J. Toone.—*Hon. Secretary:* Mr. H. Pickering.—*Assistant Hon. Secretary:* Mr. Toone.—*Exhibition Secretary:* Mr. J. Porritt. The rules and regulations of the forthcoming Exhibition of the Society, to be held February 13 and 14, were discussed and adopted, the President offering silver and bronze medals for enlargements and hand-camera work.

Leigh Photographic Society.—January 10.—The River Scenery Competition was held, the first prize being awarded to Mr. R. Leigh for a bromide enlargement entitled, *On the River Nidd, near Knaresborough.* The second prize was taken by Mr. W. Hampson for a 12×10 of *Miner's Bridge.* Mr. John Berry demonstrated successfully mezzotype paper, which is practically rough drawing-paper prepared ready for printing upon. With many subjects this paper gives artistic effects. Mr. Berry submitted many finished specimens, which were greatly admired.

Midland Camera Club.—January 9.—Mr. H. Cooper, at very short notice, gave a demonstration on *Bromide Printing and Enlarging.* After explaining the use of Lancaster's Multum-in-parvo, Griffith's enlarging camera, and Shew's extension camera, he showed the beginner how to use his own camera as an enlarging apparatus by blocking out all the light of the window except that coming through the negative to be enlarged, and the pinning of the bromide paper on an upright easel in the room. Mr. Fowler gave his experience of an ordinary petroleum lamp as a source of light for enlarging, the only objection being the time of exposure, which was sometimes one hour.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—January 8, Dr. Blacklock in the chair.—Mr. J. S. B. Bell (Vice-President) delivered a lecture on *Light*, which proved of an exceedingly interesting character, being illustrated by a series of experiments on the screen.

Widnes Photographic Society.—The President (Mr. V. C. Driffield) in the chair.—Mr. A. E. Wareing gave a demonstration on *Development of Printing-out Papers with a Solution of Pyrogallic Acid.* Prints on Ilford, Citos, and Otto papers were developed.

FORTHCOMING EXHIBITIONS.

1895.		
February 6–8	*Bournemouth Photographic Society.	Hon. Secretary, E. Greenleaves, Priory Mansions, Bath-road, Bournemouth.
March 25–30	*Brixton and Clapham Camera Club.	F. W. Levett, 11, Corrance-road, Brixton, S.W.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

NEUTRAL SOLUTION OF PYROGALLOL AS DEVELOPER FOR PRINTING-OUT PAPERS.

To the Editor.

Sir,—It is, I believe, not generally known that pyrogallol acts as a very efficient developer for partially printed printing-out papers.

I have found that, with Ilford, Citos, and Otto paper (and probably any other printing-out paper will behave similarly), a very feebly printed image can be developed into a good strong print by immersing in a neutral solution of pyrogallol containing half a grain of pyro to one ounce of water. Stronger or weaker solutions than this may be used, but the stronger the solution the more rapid the development, and the weaker the slower. A solution containing half a grain pyro to the ounce, at a temperature of 60–65° F., takes from four to five minutes to develop a print. The prints so developed, if immersed directly in the fixing bath, assume a variety of tones, ranging from sepia through the browns and reds to purple, the quality of the tone depending upon the class of paper used, the quality of the negative, the extent to which the paper has been printed by daylight, &c. If, however, the prints after development are thoroughly washed, they can be toned with either gold or platinum in the usual manner.—I am, yours, &c., Arthur E. Wareing,

Widnes, January 12, 1895. *Hon. Sec. Widnes Photographic Society.*

TO PLATE-MAKERS AND EXPERIMENTALISTS.

To the Editor.

Sir,—On page 633 of this year's Almanac Mr. H. J. Channon has a short article on the permanence of the undeveloped image, and mentions a paper I read before the Midland Camera Club, in 1891, on the keeping qualities of gelatine dry plates. I have by me a quantity of unexposed gelatine and collodion dry plates, by various makers; several of the brands are no longer on the market. I shall be pleased to receive suggestions for tests to be applied, and should like to know if any of the following makers, or their employees, are still engaged in the manufacture of dry plates:—Liverpool Dry Plate Company, Bennet, Archer, Derwent, Tilley, Stafford; Kennett.

On July 13, 1888, I exposed twelve of Thomas's ordinary plates on the lakes and rustic bridge at Capel Curig; it was a good light, just clearing up after a stormy morning. I was on a cycling tour, with my wife, through North Wales, and every evening changed my plates, and put the exposed ones into the box they were taken out of.

On returning home from our tour this box got mislaid, and had passed from my memory. In July of 1894 a friend brought me an expensive and complicated hand camera to try for him. To familiarise myself with the mechanism, I put twelve stale plates in the sheaths and exposed them on a lady in a hammock under some trees. On developing, I was puzzled at the appearance of the images, and it was only on fixing and taking them to the light that I recognised my long-lost negatives of Capel Curig. The double exposure has spoilt all of them, but clearly shows the permanence of the undeveloped image.—I am, yours, &c.,

Henry R. Leech, *President Midland Camera Club.*

PACKHAM'S PLATINUM TONING.

To the Editor.

Sir,—Referring to the "Jottings" in your last issue, I think that "Cosmos" has fallen into an error with regard to Mr. Packham's treatment of platinum prints. What "Cosmos" refers to is probably a *staining* of the *entire print*, which, of course, we all know is not new. But what Mr. Packham claimed is not a staining at all, but an actual combination of the organic tinctorial matter with the metallic platinum deposit. In the cases referred to by "Cosmos," the *whites* would be stained as well as the print; but in Mr. Packham's process the whites may be kept perfectly pure.—I am, yours, &c., J. H. Baldock, F.C.S.

Croydon, January 13, 1895.

To the Editor.

Sir,—"Cosmos" is in error. My process of toning platinum prints is quite new, and distinct from the tinting of the paper as effected by the tea-and-coffee method which I have seen Mr. Weir Brown use with the happiest result to tone down his warm bromide prints.

Platinum, as it exists in a platinum print, has an affinity for, and combines with, the material I employ, and I know of no other organic substance that will act in a similar manner.

My patent was secured in order to protect myself against just such attacks as that of "Cosmos." He will find the complete specification in the British Journal of Photography for December 14, 1894.—I am, yours, &c., James Packham.

[Mr Packham has kindly shown us several platinum prints toned by his method. The tones are effective and varied, and of a different nature to those obtained by treatment with tea or coffee.—Ed.]

BLACKBALLING AT THE ROYAL.

To the Editor.

Sir,—In my letter referring to this incident, I gave what I termed "official information."

Mr. Hinton, in his reply, says: "Mr. Sinclair must, or should, have

known that the information he says he received was not authoritative, and whoever gave it evidently committed a grave indiscretion.', &c.

Perhaps the following letter will be the best answer to Mr. Hinton's assertions:—

"*Royal Photographic Society*, 50, *Great Russell-street, W.C.*
January 10, 1895.

"DEAR SIR,—I deferred replying to your letter of the 7th instant until I had taken the opinion of the Council thereupon.

"This I have now done, and am at liberty to say, in reply to Mr. Hinton's charge of giving information which was 'not authoritative,' and of committing thereby a 'grave indiscretion,' that—

"1. The statements (Nos. 1, 2, 3, and 4) in your published letter were made to you by me on the authority of the Society's books; they were, and are, absolutely correct, and, as far as I am aware, no attempt has been made to disprove any one of them.

"2. As regards the 'grave indiscretion,' the information was given as a matter of course. The old rules imply, and the new rules distinctly state, such information is to be the right of every member.—Yours faithfully,

"R. CHILD BAYLEY, *Assistant Secretary.*"

Possibly it will now be conceded that I did not claim too much when I described my information as "official."—I am, yours, &c.,

26, *Charing Cross-road, W.C.*, JAMES A. SINCLAIR.
January 12, 1895.

Exchange Column.

Exchange oak rustic arm-chair for exterior background, lighted from left.—Address G. MOORE, Buckfastleigh, Devon.

Will exchange good exterior background for interior. Photographs exchanged.—Address, J. HUFF & SON, Maryport.

Will exchange one Thornton-Pickard time and instantaneous shutter, three and a quarter inch, for smaller shutter, two and a quarter inch.—Address, H. D. HAWKINS, Shrublands, Halstead.

Answers to Correspondents.

RECEIVED.—*Graphic Photographic Supplement. Strand Magazine*, Orford's *Lens Work for Amateurs*, PROSE, and W. J. STILLMAN. These in our next.

M. H.—Forwarded.

A. J.—Apply to Marion & Co., Soho-square, W.

GERMANICUS.—The articles have not been republished.

WM. FUSSEY; J. HAMPTON.—We have forwarded your communications to the author of the article.

H. HANDS.—Messrs. Poths & Co., Creechurch-lane, E.C., might be able to supply the desired information.

BOTTLE.—The lens should be tried previous to purchasing. Those of that maker used to be good.

A. COLE.—Probably South Africa offers the best field for a photographer who desires to emigrate. By all means advertise.

CLAUDE NEWBALD.—We are unable to give the information desired respecting French journals and their advertising rates.

B. J. HOLMES.—Any of the dealers in photographic apparatus will supply lenses and cameras for taking gem and Victoria portraits.

G. W. H.—The information is, we believe, contained in Burton's book on printing processes, published by Marion & Co., Soho-square, W.C.

SAM MADDOCK.—No medium is necessary. If you find the crayons do not "take" readily, rub the surface of the prints over lightly with an ink-eraser.

ZINCO.—We refer you to a series of articles on the wet collodion process which appeared in this JOURNAL of last year. You will find your numerous queries all fully answered there, and, in some cases, at considerable length.

S. SYMONDS.—The process is certainly a practical one, but so far as we can see it offers no advantage over those in general use; indeed, it requires more general skill and experience in its working than some of the other processes.

T. A. MOORE.—The lens is not necessarily a bad one. Even if it were the best ever made, you are expecting far too much from it. A lens of four inches and a quarter equivalent focus, with an aperture of *f*-5·6, will not cover a quarter-plate sharply to the corners with the full opening.

SUBSCRIBER.—Retouching is a topic that cannot be usefully dealt with in this column. If you read the instructive series of articles on the subject in the volume for 1890, by Mr. Redmond Barrett, you will get all the information required. Failing that, the best thing will be to take lessons from a professional retoucher.

S. RICHARDS.—Enamelled-iron vessels are not to be recommended for manipulating silver prints in, as the enamel is liable to become cracked or otherwise imperfect. However, if the enamel surface be perfect, there is no objection whatever to their use, and they may be employed with every confidence.

W. COX.—Twenty-four hours' soaking in running water, instead of conducing to the permanence of the prints, is far more likely to enhance their fading than otherwise. Perfect washing is essential, but the quicker it is done the better it is for the stability of the prints. Long soaking in water should be avoided. We are not astonished that the prints are showing symptoms of yellowness.

HERBERT SMITH.—The best way will be to get some practical lessons in the process from a competent worker. Failing that, read up what has appeared in back volumes of the JOURNAL.

R. W. W.—If the varnish was made and used as directed in the article, it should not behave as described, unless, indeed, an unsuitable sample of lac were employed. Bleached lac deteriorates by keeping, often rapidly, when kept dry; therefore freshly bleached lac should always be used when procurable. Try the effect of a second application of the varnish, using a worthless negative for the experiment.

BALSAM.—1. Remove the lens from its cell, and place it in lukewarm water till the balsam softens, which will take place in a few minutes, according to temperature. Then separate the component parts and clean the contact surfaces with benzol. Re-cement with fresh balsam, and the lens will be as good as when new. 2. If the stops are in front, the lens may possibly give a little flatter field than may be obtained by placing them in the middle of the tube. Determine this for yourself by making a trial with both positions.

RUDRASAWMYHAIDU asks: "I shall be very thankful to you if you would kindly inform me where I can obtain proper and complete information about iron printing for sensitising, &c., on plain papers, such as ferro-galli, ferro-cupric, cyanotype processes (black, blue, and red lines on white ground), &c., and whether such back numbers of your JOURNAL as treat of the same are to be had in your office, and the price. Also about making ferro-prussiate, &c., papers to keep long after sensitising."—If our correspondent will refer to the editorial article in the ALMANAC for 1889, he will find the particulars he requires.

PHOTO-LITHO says: "In Mr. Bingley's article on *Photo-lithography* in JOURNAL for February 2, 1894, he speaks of a bleaching solution suitable for the purpose dealt with in the course of his lecture. Can you state the nature of the solution and its proportional parts?"—We do not know the solution that Mr. Bingley uses, as it is not stated in the report furnished us. However, a solution of bichloride of mercury answers the purpose very well. The strength is unimportant, but the stronger it is the quicker it acts. A saturated solution is generally employed. The method has frequently been described in the JOURNAL and the ALMANAC, and is well known to most readers.

PRINTS writes: "I enclose herewith two prints, which are very much stained, and which I can't account for. This appears after being toned, fixed, and washed. The print-washer I use is an enamelled iron one. I was wondering if this would account for it; or is it likely to be hypo left through insufficient washing? I generally wash them from two to three hours in constant changes of water."—The stains are due to imperfect fixation. Either the solution was too weak, or the time of immersion was too short. At this time of the year a longer time in the fixing bath should be given, unless it is maintained at a temperature of about 60° Fahr. A low temperature impedes fixation.

OXON writes: "Many of my prints (and all the vignettes) after they are mounted show red stains like the two enclosed. The prints are treated with every care in the fixing and washing, and the stains are not noticeable before they are mounted. They generally show first, very faintly, soon after they are mounted, and more strongly after burnishing. The stains do not seem to become stronger with time; those enclosed have been done about two months, and they appear to be about the same as at first. What can be the cause?"—The stains are produced by the mounts. The chocolate colour on them contains a soluble pigment that is partially dissolved by the moist mountant. By wetting the mounts the pigment can be removed. The evil can to some extent be avoided by using as little moisture in the mountant as possible, and not wetting the prints before mounting them.

THE members of the Photographic Club gave their third annual children's entertainment on Tuesday, January 15, at Anderton's Hotel. A large number of young people were present, and a very enjoyable evening was passed. Miss L. Tottem ably played a pianoforte overture; the story of "Gabriel Grub," illustrated by dissolving views, was told by Mr. F. A. Bridge, who also sang a *buffo scena*, "Robinson Crusoe." The Misses Olive and Muriel Gaze gave a pianaforte duet in capital style; Miss Elsie Harding (a tiny girl) cleverly recited; Master Percy Lloyd very nicely sang "The Tin Gee-Gee;" Mrs., Mr., and Miss Welford kindly gave an instrumental trio on the auto-harp, pianoforte, and bells, which was much enjoyed; and Mr. Golledge furnished an entertaining selection of magic. During the evening refreshments were served, and at the conclusion the juvenile guests departed, well pleased, and in the possession of boxes of sweets. Mr. Bridge, Mr. Sinclair, Mr. Tottem, Mr. Zaehnsdorf, and several ladies kindly assisted in the arrangements for the comfort of the club's visitors.

CONTENTS.

	PAGE
CONCERNING JENA GLASS FOR LENSES	33
PYRO-SULPHITE'S YELLOW STAIN	34
DEVELOPING GELATINE NEGATIVES OF LINE SUBJECTS	34
COLLODION EMULSION FOR PROCESS WORK. By W. B. BOLTON	36
MEDAL AND MUDDLE. By HECTOR MACLEAN	38
INSTALLATION OF CARBON PRINTING. By E. W. FOXLEE	38
PHOTO-ENGRAVING WITH SILVER SALTS. By LEON WARNERKE	39
COMBINED *VERSUS* SEPARATE TONING AND FIXING BATHS. By A. HADDON AND F. B. GRUNDY	40
THE ROYAL PHOTOGRAPHIC SOCIETY	41
EXHIBITION RULES	41
WEMYSS BAY AMATEUR EXHIBITION	41
THE PHOTOGRAPHIC NATURALIST. By J. VINCENT ELSDEN	41
APPARATUS FOR ENLARGEMENTS. By J. PIKE	42
MECHANICAL DEVELOPMENT. By F. S. LEWIS	43
OUR EDITORIAL TABLE	44
NEWS AND NOTES	44
RECENT PATENTS	45
MEETINGS OF SOCIETIES	45
FORTHCOMING EXHIBITIONS	47
CORRESPONDENCE	47
EXCHANGE COLUMN	48
ANSWERS TO CORRESPONDENTS	48

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IMPORTANT DISCOVERY: A NEW LIGHT FOR PHOTOGRAPHERS.

A RECENT discovery, which was formally brought before the notice of the Society of Arts on Wednesday last week, bids fair to revolutionise some of our time-honoured methods of illumination. By the aid of the interesting paper by Professor Vivian B. Lewes, read last week, we shall endeavour to give our readers, in as popular a form as possible, some account of this new illuminant—acetylene.

Acetylene is a combination of carbon and hydrogen, many properties of which have for some time been known. From it can be built up all the other hydrocarbons capable of being used for illuminating purposes. For instance, by passing it through a tube heated to just visible redness, it is converted into benzole; at a higher temperature naphthalene (commercially known as albo-carbon) is produced; whilst, by the action of nascent hydrogen upon it, ethylene and ethane can be built up, the former of which is readily convertible into ethyl alcohol by consecutively treating it with sulphuric acid and water. Were a cheap and easy method of preparing acetylene known, it is hardly possible to foresee the results which will ultimately be produced.

This desiderated cheap and easy method has now been discovered, and the number and variety of bodies hitherto produced from coal and hydrocarbon oils which may be obtained from acetylene are altogether staggering. Indeed, it is not saying too much that the production of aniline dyes, of "coal" gas *cum multis aliis*, may henceforth be considered as capable of being carried out, even if the hour of the predicted cessation of a coal supply in every part of the world had arrived. Nay, if we correctly estimate the prospective value of acetylene, it may prove the means of supplying us with the many alcoholic beverages now in every day or evening use without the aid of the grape or the fermented grain. But it is with it as an illuminating agent that we are for the present concerned.

The means by which the synthesising of hydrocarbons, on a commercial basis, was discovered reads somewhat like a romantic story. It was not the outcome of an elaborate research, having this discovery as its ultimate goal, but was found by chance during the search for quite another object. Premising that it is an American discovery, made by Mr. T. L. Wilson, that gentleman, whilst working with an electric furnace, and endeavouring, by its aid, to form an alloy of calcium from some of its compounds, noticed that a mixture containing lime and powdered anthracite, under the influence of the temperature of the arc, fused down to a heavy, semi-metallic mass, which, having been examined, and found not to be the substance sought, was thrown into a bucket of water, with the result that a violent effervescence of the water marked the rapid evolution of a gas, the overwhelming odour of which enforced attention to its presence, and which, on the application of a light, burnt with a smoky but luminous flame. When this phenomenon was investigated, it was found that a mixture of chalk or lime with carbon in any form can, in an electric furnace, be fused with the formation of calcic carbide, and that, on the addition of water to this, a double decomposition takes place, the oxygen of the water combining with the calcium of the calcic carbide, forming lime, whilst the hydrogen unites with the carbon of the calcic carbide, forming acetylene, which is thus produced inexpensively; for, as already stated, *any form* of carbon may be used, while chalk may be had for the picking of it up, thus rendering us, as Professor Lewes continued, practically independent of coal and oil, and placing in our hands the prime factor by which nature, in all probability, produces those great underground storehouses of liquid fuel upon which the world is so largely drawing to-day.

Calcic carbide will, undoubtedly, soon be placed upon the market, probably in the form of rods or cylindrical cartridges; and, to make it yield up the acetylene, all that is necessary is to place a small quantity—say, one pound—of it in a suitable metallic vessel, and allow water to slowly drip upon it, the acetylene then pouring off in a continuous stream, the solid mass in the vessel being converted into slaked lime.

Acetylene is soluble in water, alcohol, and most other liquids. It can be condensed to a liquid by pressure, and this, when sprayed into the air, absorbs so much heat that some of the escaping liquid is converted into a snow-like solid, which, on applying a light to it, burns until it is all converted into gas and is consumed.

When diluted with twelve times its volume of air, it becomes highly explosive, which property ceases to exist if diluted with twenty parts of air. The gas is so intensely rich that it can only be consumed in small flat-flame burners; but, if the consumption is so regulated as to amount to five cubic feet per hour, then its illuminating value is equal to no less than 240 candles. The lecturer gives it as his opinion that, when liquefied for use in the country, a large cylinder of this liquid gas would supply a house with light for a very long period, for, by utilising suitable burners, a consumption of only half a foot an hour would give a light equal to from twenty to twenty-five candles.

We can, in acetylene, perceive a gas that will, at no distant period, prove of the highest value to photographers. Its great intensity will enable them to take portraits by its agency at a most trivial cost for illumination and outfit, while its simplicity and portability, added to the intensity of the light and smallness of the flame, must render it invaluable for lantern projections and the production of enlargements.

Its economic value, too, is a feature worthy of being noted; its cost—compared with that of London gas, which has an illuminating power of sixteen candles, while, as previously stated, the acetylene has an illuminating value of 240 candles, and this at 6*s.* 4½*d.* per 1000 feet—would, in light-giving value, be equivalent to London coal gas at less than 6*d.* per 1000.

At present the whole thing is so new, and, as Mr. Sugg said at the close of the lecture, "so surprising," that we have of necessity to take our description from Professor Lewes, but we hope before long to give some of our personal experiences with the light as employed for photographic uses when the commercial side has been more fully matured.

COPYRIGHT LAW IN PRACTICE.

A SUIT of some interest to photographers, and holders of copyright generally, was tried in the Queen's Bench Division of the High Court of Justice on Wednesday, last week, before Mr. Baron Pollock and a special jury. The case was not what might be termed an important one, inasmuch as no new or striking points of law were involved. Nevertheless, it was interesting, as proving what we said a few weeks back, namely, that there is a commercial demand, in lantern slides, for really good art subjects. It settles also a question—if there were really any question about it—that we have frequently answered in the correspondence column as to whether it is illegal to reproduce copyright pictures simply as slides for the lantern, though this is the first time, so far as we remember, that legal proceedings have been taken with reference to this class of picture. It also illustrates the risk that any one runs in copying works of art, whether of home or foreign production, for any purpose whatever, without first clearly ascertaining whether they are or are not copyright.

The most important thing, however, in connexion with this case is the proof that owners of copyright have a very substantial remedy for its infringement beyond mere penalties. It is this part of the case that we specially direct attention to, because it does not seem to be generally known to every one the extent of the redress that the aggrieved party can obtain. In addition to recovering penalties and forfeiture of all copies, negatives, &c., he can further recover damages in a special action for the damages sustained, and this was done in the present instance. Concisely stated, the case was this.

The plaintiff was Herr Franz Hanfstaengl, the celebrated fine art publisher of Munich, London, and New York. The defendant was Mr. Walter Tyler, the well-known extensive dealer in lanterns and lantern slides, in the Waterloo-road. Early last year a traveller for the plaintiff firm (Mr. Hunt), wishing to give a lantern entertainment to his friends, went to the defendant's establishment to hire some slides for the purpose. Amongst those shown him were a number of his firm's copyright pictures. These he purchased, and afterwards laid the matter before his principals. Legal proceedings were commenced for penalties and for damages, and also for an injunction. Mr. Tyler at once offered to give up all slides in his possession, as well as the negatives from which they were made; and this he did, and also an undertaking not to make any more; further, to pay a penalty for the infringement. Ultimately, twelve pounds were paid into Court by way of penalties, and this sum was accepted by the plaintiff, which ended that part of the case.

Two pounds were paid into Court by way of damages, but that was not accepted as being sufficient. The suit for trial was thus reduced to the simple one of the damage sustained. Experts, including the editor of the *Art Journal*, a well-known art publisher, and a picture dealer, were called by the plaintiff, who said that in their opinion the lantern slides would depreciate the value of the plaintiff's art photographs by vulgarising the subjects. Experts were also called by the defendant, who testified that, in their opinion, the lantern slides would not depreciate the value of the photographs or interfere with their sale. In the result, the jury gave a verdict for sixty-five pounds, in addition to the two pounds paid into Court, and for that amount judgment was given. The summing up of the case to the jury, by the learned Judge, was so terse, clear, and explicit as to the law of copyright, and the protection it gives to its owners, that, for the benefit of those of our readers who are not well versed on the subject, we give it verbatim as it appeared in the *Times* report of the case on the following day:—

"The learned Judge, in summing up the case to the jury, said that undoubtedly the pictures complained of here were the subject of copyright, and drew their attention to the Copyright Act of 1862, under which this action was brought. He said that it was a comprehensive Act, and under its provisions, if a person copied any painting, drawing, or photograph in which there was a copyright subsisting, then the copies should be forfeited to the proprietor. In this case that had been done. Again, the Act provided that, if such an infringement had taken place, a sum of money could be recovered from the wrong-doer by way of penalty. In this case twelve pounds had been offered and accepted by way of penalty. There was a further provision in the Act, however, and it was here alone that their judgment was required. The Act said that, in addition to the penalties and the forfeiture of the infringing pictures or engravings, the owner of the copyright might recover damages in a special action on the case. It was for them to say what sum they thought the plaintiff entitled to, looking fairly at all the circumstances of the case."

The defendant in his evidence stated that he was not aware that there was any copyright in the pictures. They were all foreign productions, and some of them he purchased abroad. Now, if the pictures were first produced in this country, a search of the records at Stationers' Hall would have shown if the copyright in them had been registered there. These particular pictures are, however, copyright under the International Copyright Convention, by which any work becomes copyright in this country provided the conditions necessary to make it copyright in the country of its production are complied with. Under the Convention the same rule applies to works published here. If the conditions of our Copyright Law are fulfilled, the work is also copyright in all countries that are signatories to the Convention. The conditions of copyright vary with different countries. In some, registration is not necessary; in others it is. For example, in Germany registration is unnecessary, while in Italy, and some other countries, we believe, it is imperative.

From the above it will be seen that it is difficult to ascertain whether pictures published abroad are, or are not, copyright. Hence any one reproducing them incurs considerable risk, and must necessarily be prepared to take the consequences. As regards the damage sustained by the aggrieved party, it, of course, is the same whether it is done inadvertently or de-

signedly. As a caution, it may be mentioned that, if any foreign picture has upon it the name of the artist or the publisher, it may almost be taken for granted that it is a copyright work.

THE INTENSIFICATION OF GELATINE NEGATIVES OF LINE SUBJECTS.

As a supplement to our articles of last week and the week before on the subject of the development of gelatine negatives for photo-mechanical purposes, we now propose to close the series with a few remarks on intensification.

To the regular wet-plate worker intensification presents not the slightest difficulty, indeed it is a portion of his every-day routine, as necessary as development itself, since the production of the wet-collodion image comprises almost invariably two operations, development and intensification, or, as it used to be incorrectly termed, "redevelopment." It is true that the image may be completed in a single operation, indeed it was formerly said that the most perfect negatives were those which were so produced; and there was probably truth in the statements, since, in order to render the one operation sufficient, a perfectly accurate exposure was a *sine-quâ-non*. But it was rather in connexion with half-tone subjects that this claim was made, for we imagine, except in the very early days of iodised collodion and pyro development, it was rarely possible to secure sufficient density for the line and litho processes then in vogue without recourse to some method of strengthening.

But gelatine plates do not lend themselves so readily to intensification as do collodion films, whether wet or dry, and this probably forms one of the reasons why it has been so comparatively little employed by process workers. Not merely because it is actually more difficult to intensify a gelatine than a collodion plate, but more probably because the wet-plate man refuses to go out of his way to learn how to produce his negative in a single operation. Although, as we admit, it is more difficult to intensify the gelatine plate, at least when any considerable increase of vigour is necessary, it is by no means the impossible task that many suppose it to be, as we shall show, and the difficulty that does exist is not so much in the direction of getting the increase of vigour as in the trouble required to bring the film into a fit state to stand intensifying. It is, in fact, to the difference—both chemical and physical—between the two films, collodion and gelatine, that must be set down in a great measure the supposed difficulty with the latter.

The intensification process generally adopted, under all ordinary circumstances, with wet, or indeed with dry collodion either, is simply a modification of the first development, that is to say, a reapplication of the same or a similar developing solution, supplemented by a fresh portion of silver nitrate. The two operations are, in fact, identical in their character. Something of a similar nature may be said to go on in the development of a dry gelatine plate, for we usually commence with a comparatively weak solution, gradually strengthening, and adding to it, for the purpose of working up the vigour of the image; the only difference is, that the work is done without changing the solution. The methods of intensification, known as such in conjunction with dry plates, are those which are only resorted to in case of emergency with wet collodion, or where the ordinary process fails to produce the desired result; and, for that matter, the same may be said in connexion with the dry plates, for very few, we imagine, nowadays make a regular practice of intensifying, as was at one time the case.

But, of the emergency methods available with wet collodion, some, when applied to gelatine films, are far less effective so far as concerns the extent to which their action can be carried, while others are practically useless on account of the almost impossibility of sufficiently washing the gelatine film to free it from soluble matter and bring it into proper condition for treatment. We may add to this that, owing to the extreme difficulty of developing an image on gelatine that is absolutely free from the slightest deposit on the transparent lines, some of the more powerful methods of intensification, if otherwise applicable, would be useless.

Of the processes more generally in vogue with gelatine plates, those based upon the use of mercury are the first to attract attention; but these, as a rule, with gelatine plates at least, are more suited to half-tone subjects than to photo-mechanical work, unless but a very little augmentation of strength is wanted. Of these the oldest and most generally used, mercuric chloride, followed by ammonia, is the readiest and most reliable if only a moderate degree of care be exercised in first of all fixing thoroughly, and afterwards washing most effectually between the different operations. Where more density is wanted than this plan gives conveniently, Monckhoven's method, in which a solution of cyanide of silver is substituted for the ammonia, will fulfil the purpose, though at the expense of a little more care in washing; while for still greater density—indeed, any degree of opacity can be secured by this means—a solution of Schlippe's salt is used after the mercury. In this case, however, not only must the washing at every stage be most carefully and effectively carried out, but the transparent lines must be perfectly clear to start with, or the filling up of these will be so considerable as to take away from the value of the intensification proper.

There is one other mercurial method, of which little is nowadays heard, which is particularly applicable to photo-mechanical workers, more especially as to them, its chief if not only fault, which lost it favour for ordinary work, is of less moment. We allude to the method known fifteen years ago as "Edwards's process," its introduction—or, at least, its resuscitation—in modern form having been due to Mr. B. J. Edwards. It is a "one-solution" intensifier, and consists practically of a solution of iodide of mercury in hypo. It may be made by adding to a saturated solution of mercuric chloride a strong solution of iodide of potassium until the red precipitate first formed is redissolved, and then adding more or less hypo as taste and circumstances direct; or, better still, the iodide of mercury may be precipitated by mixing equivalent proportions of the two salts already mentioned, and, after washing, stirring in crystals of hypo until the scarlet precipitate is first dissolved. After this, at least as much more hypo is to be added, and the solution thus formed can be diluted to any convenient strength for use, the only effect being on the rapidity of action.

This solution gives almost any desired density by merely allowing it to act sufficiently long, and the colour and appearance of the image are precisely like a good wet-collodion negative. But, unfortunately, the image is not permanent, gradually becoming weaker on exposure to light, though to photo-mechanical workers, unlike ordinary photographers, this is not a matter of great importance.

Two very favourite methods of intensification of collodion images, especially for line work, the bromide of copper and the ferridcyanide of lead processes, are, so far as we, have tried, perfectly useless with gelatine on account of the extreme difficulty, if not, indeed, absolute impossibility, of sufficiently washing the films between the various operations. At any rate, if success be possible, it will only be at the expense of an amount of trouble that would practically place either process out of the question.

We now come to the last and, as we consider, best method of all, not only for photo-mechanical, but for all purposes, if properly and carefully used, namely, silver intensification, or the method with which the wet-plate worker is already perfectly familiar. But he will have, if not to unlearn part of what he already knows, at least to look at things in a somewhat different light; in fact, to learn to adapt the familiar method to the new circumstances. Silver intensification was regularly used in the early days of gelatine, but gave place to other methods that required less care, or permitted more carelessness, and of late years intensification is so comparatively seldom required that it has dropped out of use. It was supposed to necessitate far more care than other methods, and that the negative was afterwards bound to discolour in time from the action of the silver on the gelatine; but we have shown over and over again that these assertions are both the outcome of carelessness rather than accuracy of observation. We have negatives in our possession now that were intensified with silver fourteen or fifteen years ago that are as clear as when freshly made.

The requirements, as applied to gelatine, are, first of all, development free from fog; next, thorough fixation in clean hypo, and preferably two baths; after this, very thorough washing. This latter is all-important, and is far superior to the use of any so-called eliminators, though a solution of alum and citric acid may be used in addition, not only as a final surety, but because it prepares the film for the intensifier. This consists of the ordinary pyro and silver as used for wet plates; only, in order to avoid the staining action of the ingredients upon the gelatine, it is necessary to use more acid, and to let a portion of it be *nitric*, which, amongst other advantages, prevents the pyro becoming muddy or the silver depositing. A little glycerine may be added, in order to make the solution flow easily, and enable the negative to be intensified in the hand, like a collodion plate, instead of in a dish, a variation from ordinary gelatine practice that will be appreciated by those who have seen the quantity of silver that deposits on the back of the glass.

The operation requires no special comment beyond the remark that, partly owing to the increased dose of acid, the action is slower than with a collodion plate. The image, too, becomes much denser on drying than it appears when wet, a fact that deserves to be borne in mind. Sometimes, in cases of prolonged application, the shadows of the negative or clear lines will become deeply stained orange or even ruby; but, provided the film has been properly washed after fixing, this does not matter in the least, as a dip into the alum and citric acid clearing bath removes the colour instantly. If, however, it arises, as may happen from hypo on the film, it is an irremediable case.

The clearing bath need only be used in case of this stain. Under ordinary circumstances, after washing for a few minutes after intensification, the plates should be soaked for five minutes in a strong solution of common salt, and then passed through a clean hypo bath, and, finally, again washed, this latter treatment being intended to guard against any possibility of silver compounds remaining in the film to produce eventual discolouration.

By this method a far greater augmentation of density is obtainable than by any other available, and it offers the advantage, that a comparatively thin and perfectly clean image—which is easier to get than a dense and clean one—may be worked up to printing density with far less clogging of the finer lines.

A Photographic Poster.—Many artists, particularly in Paris, have recently brought their talents to bear on the design and pictorial scope of posters, with sometimes the happiest results, as the street hoardings show. We have now arrived at the photographic poster. Mr. W. J. Warren, of Leeds, is responsible for one advertising a lantern lecture on Norway, by Mr. Paul Lange, to take place at Leeds on Thursday last, January 24. It is a large bill, about five feet by four, and very effectively portrays a regally attired and buxom young person standing out against a background of mountains, which are doubtless characteristic of Norway. The bill, which is as tasteful as it is effective, is issued by the Leeds Photographic Society—the oldest society in England.

Incorporation of the Royal Photographic Society.—This Society, as many of our readers are aware, has recently been incorporated, the Board of Trade license having been granted on the 31st of last December. The memorandum and articles of association are now issued. The advantages of the transformation may be thus briefly summarised:—(1) Limited liability; (2) The members shall n future consist of ordinary members, fellows, and honorary fellows; (3) Existing members may become fellows on payment of a subscription of 2*l.* 2*s.* per annum; but, after a certain date, "the qualifications for fellowship shall be decided from time to time by the Council, but shall always be such as in the opinion of the Council shall tend to make the fellowship of the Society an indication of ability in one or other of the branches of photography." Fellows will possess the inestimable profit and delight of placing "F.R.P.S." after their names.

Valuable Astronomical Work with a Lantern Lens.—Professor Barnard, of Lick, has been taking some photographs of the region in which lies the great Orion nebula so wonderfully photographed by Dr. Roberts with no better an instrument than an ordinary magic-lantern lens of the cheap portrait-lens make. The results are considered to be of a very valuable nature. It appears that some half-dozen years ago Professor W. H. Pickering photographed the same region, also with a portrait lens—a Voigtländer combination of 8·6 inches focus. The new photographs fully confirm the old, and thus a most important discovery in astronomy that these photographs have been the means of bringing about was the production of a cheap, common lantern lens. As "A Fellow of the Royal Astronomical Society," of the *English Mechanic*, writes, "Let the amateur of limited means note and remember that these most interesting and important results were obtained with the objective of a cheap magic lantern!"

JOTTINGS.

Lord Beaconsfield, in his charming but little-read novel, *Henrietta Temple*, has a graceful reference to the human hand, wherein he remarks that, long after a woman has lost the youthful beauty of her face and figure, that of her hand will still remain to her. Although it is many years since I read the book referred to, the particular passage, or, rather, the substance of it as here given, inevitably comes to my mind whenever I am looking at a three-quarter or full-length photograph, or one indeed in which the hands are allowed to be seen. In most photographs the hands suffer a double injustice—they are rarely disposed with any regard to naturalness of position; they are usually represented as inert,

chalky, and accidental appendages. Matters in this respect, however, have somewhat improved of late years, and it is to be hoped that we have eternally taken leave, even in the work of the least competent photographers, of such efforts at posing the hands as placing one of them flatly on top of a book, hanging them by the sides, extending them too far out of the picture, with the usual pleasing effect in the way of distortion, and so on. Nevertheless, there is still plenty of room for improvement in far too many cases. Except on the stage, or in a photograph, one seldom sees a man or woman with his or her hands awkwardly disposed. Among actors and actresses, I believe, an easy and natural management—I was going to say manipulation—of the hands is regarded as a rare accomplishment. And it is in the persuasion that it is of equal importance to the portrait photographer, who is too prone to neglect it, that I here make mention of it.

The recent history of the Royal Photographic Society gives point to the publication, in the last number, of the attendances of Members of Council at the meetings of that body. Not merely must the members of the Society be interested in the figures, but also the photographic world at large, of which the Society is likely in the near future to be more than ever the representative and the mouthpiece. The outgoing Council has shown in the most effective manner that it has the interests of the Society at heart, namely, by its attendances, each member having an average attendance at seven meetings out of a possible ten. As it is admitted on all hands that the Society during the last twelve months has been signally well governed, the obvious inference is that the Council should, as far as possible, be re-elected. I am therefore all the more surprised to be informed by a correspondent, who is in a position to know, that a movement is on foot for drafting into the new body a number of gentlemen who for years past have shown their interest in the affairs of the Society by carefully having nothing to do with it except paying their subscriptions, who are not known to be in touch with the photographic world, and yet are considered eligible to legislate for it. The treacherous glamour of social position and the prefixation and affixation of certain coveted titles and initials to candidates' names are occasionally known to cast a spell over the actions of electoral bodies; but, in the case of the Royal Photographic Society, I shall be highly deceived if the members are induced to reject old and well-tried lamps for new ones of uncertain illuminating power. I hope it is not too late for those concerned to profit by this friendly and well-intentioned hint.

I am sorry to have incurred the charge of being in error with regard to Mr. Packham's method of treating platinum prints, and I must beg to be allowed to deny the soft impeachment. My reference to the matter, on January 11, was based, as I pointed out at the time, on a sentence in the report of the Croydon Camera Club, and, to make my denial clear, here are text and sermon parallelised:—

Croydon Camera Club Report, page 13, *January* 4.	"*Cosmos*," *page* 21, *January* 11.
"The President . . . . took occasion to compliment Mr. J. Packham for his promising discovery . . . . of the application of various tinctorial solutions to changing the colour of platinotype prints from black to various tones of brown."	"I have not the specification of Mr. Packham's patent at hand to refer to, ... but . . . . I myself have used two very common . . . . infusions for the same purpose, viz., tea and coffee."

Tea and coffee certainly "change the colour" of platinum prints to various tones of brown, so that I do not see how I can be accused of error in making the comparison. The error, if anybody's, is the Croydon Camera Club's reporter's, in not being more explicit in his details of the *rationale* of the Packham process.

Since the appearance of Mr. Packham's letter, I have found an opportunity of perusing the specification of his patent, as given on page 793 of the last volume, which I had not at hand when originally referring to the subject, and I hasten to say that the particulars there given supply me with a far clearer idea of the matter than that afforded me by the reported utterances of the President of the Croydon Camera Club. Mr. Packham's process is apparently a chemically toning one by means of vegetable dyes in solution—a totally different, and doubtless more effective, plan than staining with tea or coffee. I have read the specification with great interest, not only because, contrary to most cases, it is clearly and intelligibly drawn up, but because Mr. Packham appears to have hit upon a toning process alike novel and simple, and having, so far as I can gather from the specification, great elasticity in the range of tones produced. I am, I think, tolerably familiar with all that has been attempted in toning methods during the last thirty years, but I can safely say that Mr. Packham has earned the distinction—a difficult one to acquire—of hitting upon an absolutely new idea. By the way, he charges me with "attacking" his process. I hope this paragraph will convince him that I was guiltless of any such intention. So now, Mr. P., shake hands, and send me a tinctorially toned print, so that I may see what it is like.

Mr. Baldock's interesting note on the above subject reminds me that tea and coffee staining, and toned, or tinted, papers were often suggested and employed long ago for imparting more agreeable effects to photographs than those obtained in the ordinary way. Where the infusions named, however, were used on silver images some suspicion of accelerated fugacity was entertained, and the same remark, I think, applied to the use of aniline dyes, which were also occasionally used. Whether, in the cases of platinum prints submitted to tea or coffee staining, like ground exists for fear, I can hardly say; but I have some three-year-old tea-tinted platinum prints, which, so far as I can discover, are unchanged. Mr. Baldock's objection that these infusions "stain" the whites of a print is not in conflict with the growing antipathy to photographs that *look* like photographs. Theoretically, most photographs having pictorial pretensions should have no "whites," hence, generally speaking, their staining, or tinting, will be found an artistic advantage. The depth of tone may be varied by the quality of the tea and the strength of the infusion, so that who knows that in these enterprising days we may not soon see, in the grocers' shop windows, bills running something like this: "To Amateur Photographers! Try our marvellous one and fourpenny 'apenny counter-siftings! A money-saving blend for family consumption, and yielding rich sepia tones on platinum prints! Competition and the Stores defied!"

According to the financial press, trade throughout the country has entered upon a much-needed stage of improvement, and, from what I can learn, the photographic industry shows signs of also participating in the general revival. Several new manufacturing enterprises are projected, a fact which in itself may be taken as favourably symptomatic, while activity and growing good business are agreeable complaints from which many of the older houses are suffering. Among those who are about to tempt fortune is Mr. J. B. B. Wellington, who intends, I am informed, shortly to commence the manufacture of bromide and gelatino-chloride paper at Elstree, Herts, where he has erected a large factory, and is laying down costly and efficient machinery. Mr. Wellington is a general favourite in the photographic world, and a good photographer, able experimentalist and practical worker. His record, in fact, is such that I am sure everybody will allow that he deserves success, and will accordingly wish him plenty of it. So here's to you, "J. B. B.!"

The rules and recommendations for the guidance of Judges of photographic exhibitions and societies promoting them, as reproduced last week, strike me as being on the whole reasonably just and sensible, and, where intelligibly administered and applied, should, and doubtless will, lead to the distribution of awards with a residual minimum of dissatisfaction; but, in the interests of a perfectly equitable and unbiassed adjudication of awards, I suggest the adoption of an additional recommendation to societies, to the effect that the Judges be selected by the members of the society holding the exhibition, the voting to be by ballot. This might prevent the curious spectacle, which was witnessed more than once last year, of the

judicial triumvirate, consisting of three gentlemen got together by Mr. Arrangement, having common interests in signalling out their friends' pictures for medals, and making a nice little mutually profitable affair of their bestowal and receipt. Funny, but quite true!

"What's the use of honesty when humbug only pays?" sings Mr. Albert Chevalier, the fashionable coster comedian. Photography is just now the field in which humbug and knavery of the most transparent kind are once more flourishing; the free portrait swindle is as rife as it was three years ago. Judging from the lucrative nature of the business driven by the Oxyzone people, whose case is engaging the attention of the Bow-street magistrate, the free-portrait scheme is eminently well calculated to attract a rich harvest from a wilfully blind and foolish public. It will ever be to the credit of this JOURNAL that it has always fearlessly denounced this constantly resuscitated free portrait plot, and it is a pity there should be room for regret that its contemporaries will not also do their duty, and join in the crusade for the erasure of this dark and ugly blot on modern photography. What, too, is that profoundly useful, loftily-named body, the N. A. P. P. about? COSMOS.

THE HAND CAMERA: THEN AND NOW.

[London and Provincial Photographic Association.]

WHEN that energetic Secretary of ours made that celebrated demand for two papers at the commencement of his otherwise honourable term of office—well, that was "Then."

When your humble servant, who was weak enough to give in two titles of papers, commences to jot a few ideas down for the present paper—that is "Now."

It was so easy to promise, but the "now" end has proved difficult, because, really speaking, the subject is not so elastic as I imagined it would be. The paper will therefore be rather short; but, still, I trust it may arouse a little discussion and interest.

The progress of the hand camera, both in manufacture, use, and popularity, has been a triumphal march, but a somewhat uneventful one. There has been no jumping, no revolutions; and, indeed, we cannot even get the consolation of terming recent years "the age of the hand camera." It has been a steady advancement all along the line. In the old days fighting was sharp and frequent, the older workers arguing at great length against the plate-wasting, snap-shot man. On the other side there were a few cranks like myself, who, upon all occasions, waxed eloquent in phrases profuse and enthusiastic, perhaps not always generous, but certainly honest, and the result of convictions. These cranks are still here, and, indeed, there are more of them now than then; but the enemy has melted away. The opponents of a few years ago, where are they? Dead, perchance, killed by the vigorous onslaught of the hand-camera crank? Not a bit of it. They've simply bought, borrowed, or stolen hand cameras, and joined the mighty throng of victors. Like Othello, the occupation of the hand-camera defender has gone, and he can now pursue his hobby in peace.

There seem to me to be three stages in the life of the old tripod worker upon hand-camera questions:—

First Stage.—Contempt and scorn, hard words, arguments, convictions, and knowledge of his many years' experience. He won't even touch one, nor let his eyes wander towards the hated object. Tell him a print is from a hand-camera negative, and see his aristocratic lip curl in derision. He talks glibly about the ruin of photography, the foe to artistic expression, the waste of good time and material.

Second Stage.—Carries one about with him for a few shots, but uses his tripod and 12 × 10 for "pictures." At the Convention may be seen many in this stage. "Oh, yes," he says, "I've got one to knock about with; but I use the 12 × 10 generally."

Last Stage.—The 12 × 10 remains at home. The curtain can come down at this point.

I did intend to go back a few years and quote proofs of the ferocious way the hand camera and its votaries were attacked. It would not, however, be of much interest now, though intensely amusing.

So much for the opponents of ancient days. Now let us consider the apparatus. A very simple start was made with plain cameras in boxes, but gradually we fell into the whirl of the patent stream, and complicated movements became the order of the day. Next we passed through the toy period, when purses, watches, scarf pins, &c., were brought into requisition, to say nothing of toys at 2*s.* 6*d.* and 5*s.* We had cameras in our hats and ties, when the purse came out to pay that "much-overdue account" a camera came with it; innocent books opened to reveal—cameras; if we looked at the watch to see the time, we saw—a camera. Then we also had the chest-protectors, big, round, metal plates that rested under the vest against the stomach, making the wearer always imagine that he had eaten too much dinner, still—a camera. These things are pretty well gone, and many of the complicated patterns have also either gone to the wall or are reduced to weak strugglers in the market.

And yet, with all the changes and progress made, the camera I freely offered to the world in 1889 has not yet been introduced. The requirements were something like this, that we should only have to put the plates in, and then, by a series of levers, buttons, and springs, produce the negative and a framed print with the exhibition medal attached.

The present tendency is towards cut-film patterns, and we have at least two very efficient samples before us. The convenience of a magazine-changing arrangement that will enable us to expose forty to seventy films, without recourse to a dark room, must be very obvious; and, just as certainly as films will eventually replace glass plates, so will the cameras of the future be for films.

There is one great advance of 1894 that deserves reference, it is the new finder. The old mirror and ground glass are certainly quite out of it with the new comer, introduced by one of our most energetic firms, in which, even in the brightest sunshine, a brilliant image is obtained.

In one direction there has been but little advance; in fact, the point seems quite neglected. It is this, that far too much attention is paid to the apparatus, too little to the user—the man. Failures are laid at the doors of the camera that should be placed to the man, and successes are inscribed upon the apparatus that belong to the worker. It is certainly becoming more generally understood and accepted that a hand camera is more difficult to work with success than a stand camera. But this is hardly the point. What is wanted is appreciation of the fact that the worker has more to do with success or otherwise than the apparatus. A good hand-camera worker is born, not made; at least, usually he is. If he is not, and still gets on, it will be found that he takes a good deal of making. A mass of failures, a mountain of disappointment, has been ascribed to unsuitable tools that should be debited to unsuitable individuals.

With regard to the present position of the hand camera, well, what can be said? It almost looks as if the stand camera (leaving out commercial work) is going to be swept off the face of the earth, speaking, of course, generally. Let us take a big gathering—say, the Convention—with perhaps 200 photographers at some outing. You will find there six hand to one stand camera; and, could we but get at the figures, the sales respectively of quarter and half-plate stand cameras, compared to hand patterns, must now differ absolutely inversely. In my opinion, too, many more hand cameras are sold now (leaving all toys and cheap trash out) than ordinary patterns.

Upon the art side, too, who can deny the beauty of the work to be seen at our Exhibitions, work equal in its artistic merit to, and ranking with, anything upon the walls? Indeed, many instances of medals and awards falling to hand-camera pictures could be quoted. I will only give one, viz., the marine class at the recent Stanley show. The gold medal went to a little quarter-plate hand camera shot by Evershed, whilst upon the walls hung work by Clement Williams (Chicago gold medal exhibit), T. M. Brownrigg, William Norrie, Charles R. Whiting, J. H. Gear, H. W. Bennett, Marshall Wane, R. S. Webster, James E. Goold, W. P. Marsh, and other noted exhibitors.

The experience of recent exhibitions upon the question of size has pretty conclusively proved to me that a hand-camera picture stands a much better chance of recognition at the hands of art judges than the technical or "scientific experts," as they have been termed; and, as I have so often tilted the lance against the art photographer, I gladly credit him with less regard for size and more for effect. The technical Judge cannot so readily remove the impression produced upon his mind by a large-sized print, but the art Judge receives no impression from either the largeness or smallness of dimensions. Its method of production, the apparatus, the process, and all these questions never trouble him. All he sees is the picture. Therefore I assert that hand-camera pictures are more fairly judged by those whose inclinations tend towards artistic expression regardless of procedures; and, moreover, they would have received recognition before had our present advanced Judges been available.

The hand camera now occupies a perfectly unassailable position, whether in its utility as a recorder of passing events and the life of

our country, or in the pleasure it affords of bringing back with us pictorial *souvenirs* of happy holiday hours, or, lastly, with regard to the making of pictures. Only those who have passed through the fire of criticism and abuse can appreciate the present position to the full. I for one take pride in the fact that the hand camera has always had one friend, and there are several others who must also be delighted at the present state of affairs. To put it briefly:

Then it was snap-shot and maniac,
Now it is picture and photographer.

Any claims on my own behalf as an exponent of the hand camera are based upon persistency. I was not by any means the first, nor, as regards results, the best; but, from the very outset of my hand-camera work, have moved, breathed, and lived in it. Any claims to recognition as a hand-camera man I base upon the fact of having probably written more, said more, lectured more upon the instrument, and defended it more vigorously than any other photographer. I have defended it as Chevalier sings:—

'When luck was out, when luck was in.'

Just a few words in conclusion upon my oft-repeated urgings to study life and character. We photograph a ruin because it is historical. We are wasting material. Our photograph will not add one jot to the romance or history. That is told in prose and verse, and our photograph will not enhance the tale. If, however, we deal with human life and record the present for the benefit of the future, we shall be doing more good. This is why I believe the hand camera to be *the* camera of the future, for in this direction it will give the results that an ordinary camera is perfectly helpless to do, and our hand-camera shots—the much-despised snap-shots of olden days—will live and be of interest when the other photographs are mere curios deposited as fossils in the photographic museum.

Then our work will be appreciated.
Now let's see that we do it.

WALTER D. WELFORD.

CHILDREN AT THE PHOTOGRAPHIC CLUB.

[BY ONE OF THEM.]

Pa's Club, where he goes photographing on Wednesday nights, gave a children's entertainment on Tuesday, January 15, 1895, at Anderton's Hotel in London. Ma said pa was to take us. Pa always does what ma says, so me and Tommy went. Lots of children also went. Tommy said some of the children were a "bit oldish." I'm a girl, aged ten; Tommy's six and a half. Ma said we were to see the place where pa did the photographing till ever so late on Wednesday nights. Tommy said, "Wouldn't we just!" Tommy says such funny things sometimes, but Tommy's only a boy.

It was a big room where the entertainment was. There was a large sheet on a wall, and a magic lantern at the other end. The room was full of children, and people, and me, and Tommy, and pa. A girl played the piano. Tommy clapped his hands, and said she "did *my* dags." She was taller than me, and older. I've only had two quarters at the pianoforte. Ma pays my teacher 13*s*., and gives her her tea on Wednesdays. Then they made the room dark, and showed Gabriel Grub and the goblins in the magic lantern. The gentleman who talked said Gabriel Grub was a gravedigger, and the goblins took him down in the earth because he made faces at boys at Christmas. I don't wonder at Mr. Grub not liking boys. Boys are so trying. But my teacher says there are no such things as goblins. I've never *seen* one, so I think teacher is right. Tommy laughed quite loud at the goblins. He said, "Wouldn't they frighten baby!" People and children *looked* at Tommy; no wonder! Then the magic lantern showed us donkeys, cats, dogs, angels, flowers, men, women, statues, and other animals. Tommy said the angels were real pretty. Pa sometimes calls ma an angel, but ma hasn't got wings—at least, I've not seen them, so she can't have. Then they turned the light up, and pa went out to see how the weather was. When he came back he said it was all right. I was so pleased, because I had left my parasol at home. I asked pa where he did his photographing in the hotel. Pa said upstairs. Tommy said *he* knew the kind of photographing pa did. As if he *could* know, and only six and a half! But Tommy's only a boy.

Then two little girls played the piano; one had lovely long golden hair, the other was dark. The gentleman who told us about Gabriel Grub sang "Robinson Crusoe." I didn't know "Robinson Crusoe" was a song. I've got it in a book; my teacher gave it me for a prize, and wrote my name on the first page. Tommy said it didn't matter, you could make anything a song. He liked Robinson Crusoe better as a song; it was easier than reading. Then a *very* little girl recited two such nice pieces. Tommy said pa did that sometimes. I said I liked the little girl's pieces best; pa recited such hard ones Tommy said, "Of course; he's a man." A little boy sang a song about a tin gee gee. I said, Whoever heard of a horse made of tin? Tommy said the littl boy meant the gee-gees like he got on the Christmas-tree. Why didn't the little boy say so, then? he said his gee-gee talked, and made of tin, too. The idea! Then a gentleman and two ladies played the harp, the piano, and the bells. It *was* nice. Pa said he'd heard it before. I asked pa what he photographed upstairs, and if he made any mess on the floor like he did at home. Pa said I was too young to understand. Tommy said pa didn't do photographs there; he only talked about them. He'd seen it in the paper. The idea! Tommy *does* say such things; but he's only a boy.

Then a gentleman brought us cake and biscuits and orange wine or something in wine glasses. I had one piece of cake; Tommy had two pieces of cake and a biscuit. The gentleman offered pa some coffee. Pa shook his nead. Tommy said he knew what pa would like. Pa told Tommy to behave himself, and the gentleman laughed. When there was no more cake, a gentleman got on the platform and did some conjuring. He made half-crowns come on children's coats, and dresses, and heads, and got such a lot in a hat. I wish pa could do that; he *would* be rich, and we could move into a bigger house. Tommy said a conjurer at his school treat made real cabbages come out of a hat. I'd rather have half-crowns. Tommy said when he grows up he'll be a conjurer and a photographer instead of an engine-driver. Pa went out again to see the weather. He said it was all right. Tommy said, "Was it wet?" The idea! and when pa said it was all right! I asked pa to show me the room where he did the photographing. He said it was only open on Wednesday nights, not Tuesdays. What a shame! Tommy said it was only like pa's room at home, with bottles, and dishes, and things like they have in chemists' shops. The idea! as if pa would stop in town to go in a room like his own! Ma says it's different. Ma knows; so do I. Tommy's only a boy.

After the conjuring, pa said we must go. A gentleman gave me and Tommy a box of chocolates each. Tommy eat his chocolates on the way home. I saved mine. Tommy said the Photographic Club was a nice place. Would pa take him some Wednesday? Pa said, Yes, when he grew up. I said I should *like* to *see* pa photographing at the Club. Tommy laughed quite loud; so did pa. I wonder whatever for. I'll ask ma.

SOME FORGOTTEN PAGES OF PHOTOGRAPHIC HISTORY.

[Brixton and Clapham Camera Club.]

A STATEMENT which cannot too often be repeated in these days is that no branch of photography is in so rotten and untrustworthy a condition as the history of photography itself, and that some of the inaccuracies or omissions are connected with subjects of major importance. A few men, who are good linguists, who have also good critical capacity and unbounded leisure, might render inestimable service by devoting their energies to a critical analysis of the history of photography, free from local colouration—for science belongs exclusively to no single nation—and building up only after reference to original documents containing items of first publication, not trusting to authors who copy from each other, or to anonymous newspaper paragraphs. Such workers will find many a wrong to put right, many originators of quiet respectability, who have not entered the arena of public contention with mountebanks of noise and bluster, who have seized their discoveries and paraded them before the world as their own, after, perhaps, introducing a few worthless modifications. To those who care not for knowledge of true history as a matter of culture, but look to practical matters alone, a vast storehouse of photographic discoveries exists, now wholly forgotten, which here and there contains facts likely to prove useful under the light of present-day knowledge. Especially is this the case in relation to the records in *La Lumière*, of Paris—not the journal of that name now existing, but the earliest of the larger newspapers devoted to photography. It was edited by Gaudin.

Although several illustrations of the deficiencies of popular photographic history are available for bringing under your notice this evening, but three will be presented in the brief time at our disposal.

If the early work of Sir John Herschel in relation to photography were now without mention in books dealing with the historical part of the subject, the omission of all reference to the labours of such a highly trained man of science would be a great defect indeed; yet this is what has occurred in relation to the photographic researches of the great French physicist, Foucault, whose earliest scientific work was in relation to photography; indeed, it was the doorway through which he entered the scientific world. Yet his work in photography has been so completely overlooked in these later times that in scarcely any recent photographic history, English or French, is mention to be found of more than his name, if so much as that. M. Davanne—who so untiringly year after year works at the promotion of the interests of the Photographic Society of France that I wonder at his not having long ago been made President thereof—says nothing

about Foucault in his great two-volume book on photography and its history. Charles Fabre, in his extensive work, the *Traité Encyclopédique de Photographie*, Paris, 1889, mentions nothing more than that Foucault once devised some meritorious instantaneous shutters for photographic purposes. The recent *Bibliography of Astronomical Spectroscopy*, by Dr. J. Scheiner, of Potsdam, says nothing about Foucault's researches in the photography of the solar spectrum; it alone mentions that Foucault was the first to reveal the direct reversal of the sodium line in the electric arc light. If, then, French and other good foreign writers have allowed the honoured name of Foucault to practically drop out of photographic history, there is some excuse for writers upon this side of the Channel having done the same. Yet he sometimes honoured the French Photographic Society by his presence; he was at one of its meetings so lately as the year 1862, and presented the Society with an instrument of precision, in the shape of a heliostat, devised by himself for use in photographic work with a solar enlarging camera.

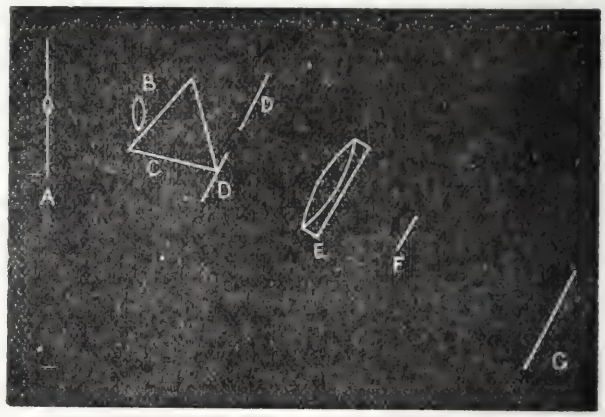
Jean Bernard Léon Foucault was born in Paris September 19, 1819, and died there of paralysis, February 11, 1868. For the information of those photographers who may be outside the realms of physical science, it may be mentioned that, among his more popular achievements, was the devising of a pendulum which would indicate the revolution of the earth upon its axis. It consisted of a heavy metallic ball, suspended by a hair-like wire of great length, with a point of attachment at the upper end of such a nature as to have no tendency to give the wire a twist. Its vibrations were all in one plane, so that as the earth turned it did not turn with it, consequently it gradually vibrated towards all the points of the compass in turn. This pendulum was fitted up by permission of the President of the Republic under the great dome of the Pantheon at Paris, and drew crowds to see it day by day. He also invented a form of gyroscope, by which the rotation of the earth was indicated. He devised an instrument for the direct measurement of the velocity of light, and gave it as 185,000 miles per second. Once he devised an instrument by which a plate of copper was heated simply by rotation in a strong magnetic field, with nothing touching it, an experiment which the late Professor Tyndall often had pleasure in repeating in his public lectures. I have but mentioned a few popular examples of Foucault's class of work, but in the scientific world he has a reputation as a physicist of the highest order.

His researches in photography, together with those in relation to other subjects, will be found in collected form in a book entitled, *Recueil des Travaux Scientifiques de Léon Foucault*, by C. M. Gariel and J. Bertrand (Paris, 1878). It consists of his works collected and published at the expense of his mother after his death. As to his work in photography, the first essay upon any subject which he ever published was upon the best method of using bromine in the Daguerreotype process. This was issued in November 1841, or but two years after the Daguerreotype process had been made known. Another early essay related to the advantages of organic matter in the form of resin and starch on the Daguerreotype plate. Foucault found that a trace of organic matter did not increase sensitiveness, but it diminished fog, whereas Daguerre had published that the presence of organic matter decreased sensitiveness. Some of his experiments on photo-micrography with Daguerreotype plates were published in 1844. The first experiments on photo-micrography were by Davy in 1802. In 1846 Foucault described his experiments on the action of the red rays upon Daguerreotype plates. A fifth essay was on the special action of the rays at the red end of the spectrum upon substances sensitive to light. This was written in conjunction with Fizeau. A sixth was on Daguerreotype plates bromised to the second degree. A seventh on the use of "star" diaphragms in the Daguerreotype process. Eighth, on the application of the electric light to the solar microscope. Ninth, on the photo-electric microscope, written in conjunction with M. Al. Donné, 1843. Tenth, on the Daguerreotype microscope, 1845. Eleventh, on Photometry, 1855. Twelfth, on the phenomena of the interference of light, 1845 and 1846. Thirteenth, on stereoscopic vision. He published numerous papers on optics, some of which have more or less bearing upon photography, especially astronomical photography.

Some of Foucault's experiments related to curious photographic phenomena. Wollaston, at the beginning of the century, first gave out the idea that the two ends of the spectrum oppose each other in photographic action. Sir John Herschel, in 1840, recognised that the red rays have a protective action. This was confirmed by Fizeau and Foucault in 1844, who found that the less refrangible rays of the spectrum exert a neutralising action upon plates which have had a pre-exposure to white light. They obtained the effect with bromised and iodised Daguerreotype plates, and with chloride of silver paper. Becquerel had found that, if oxidised plates, which had been exposed to white light, were placed in the red rays, the latter had a "continuating" action, but that it was never so with bromised plates, the plates had to be iodised simply. These problems require more investigation.

Photo-micrographers may be interested to learn that the *Atlas of the Course of Microscopy for Complementary Medical Studies*, by Al. Donné, published by Baillière, of Paris, 1845, contains engravings copied from the Daguerrotypes taken with the apparatus of Foucault and Donné, sometimes with solar light, and sometimes with the light of the electric arc.

Foucault devised a simple and ingenious method of mixing any of the pure colours of the spectrum at will, and throwing them on the screen, so as to produce a colour patch of the tint due to the intermixture. His method was first publicly exhibited in 1849 by M. Pouillet, in one of his lessons on physics at the Sorbonne, and was afterwards published in *Cosmos* in 1853. The following is Foucault's arrangement for the purpose:—A cylindrical lens, A, of short focus, gives a linear image of the sun, and the rays fall divergently upon the simple lens, B, acting as collimator, then fall parallel upon the flint-glass prism, C. A rectangular diaphragm, D, is placed in the path of the refracted beam; then comes a large achromatic objective, E, placed beyond its principal focus from D, and giving a sharp, real image of the spectrum at F, at the principal focus of the lens. At G is a white image of the rectangular diaphragm, D, due to the recomposition of the rays. By means of variable shutters at F, blocking out the



colours of the spectrum not intended to be mixed, those which are allowed to pass give tints resulting from their mixture upon the screen, G. By this arrangement every known tint can be produced.

Into the details of Foucault's photographic work it is impossible to enter during the time at our disposal, but he and Fizeau, like Sir John Herschel, obtained experimental evidence of the protective action of the red rays. One of their experiments was briefly the following:—They prepared chloride of silver paper, exposed it to the rays of a lamp flame for one-fourth of the time of that necessary to visibly alter its tint, then submitted it to the action of the spectrum for one hour, and obtained a visible image. This they dipped into a saturated solution of gallic acid, and the ground all became fogged, except where the red and other of the less refrangible rays had fallen. Foucault's early experiments in photographing the spectrum upon Daguerreotype plates are interesting, and his results were not complicated by the presence of collodion, gelatine or other colloids. In those early days photographers were so anxious to improve processes and to quicken them for purposes of portraiture that perhaps these researches in the higher branches of photography interested them little, and soon afterwards were forgotten entirely, so that the name of Foucault, as a pioneer of photography, has practically passed out of the literature of the subject for nearly a generation.

Five photographic processes, independently devised by different men, were first made publicly known within a few months of each other, namely, Daguerre's process on silver plates, Nicephore Niépce's bitumen process, which he had devised many years before, and the paper processes of Mungo Ponton, Fox Talbot, and H. Bayard. Although the name of Bayard has not so utterly dropped out of modern photographic literature as that of Foucault, and never has been forgotten in French photographic literature, I think that so little is now remembered about him that his case may be brought forward as an illustration of my subject.

Bayard was the first man to exhibit a selection of photographs to the general public, and he did so on July 14, 1839, in Paris; they were on paper. A few days earlier Daguerre had exhibited specimens of his work to a large number of persons, namely, to the

Deputies of the French House of Representatives, as described thus in the *Moniteur Universel* of July 8, 1839: "The proposed law to award a pension to Messrs. Daguerre and the son of Niépce for their fine discovery being the order of the day, several pictures obtained by the Daguerreotype were exhibited in one of the salons of the Palace of the Chamber. The Deputies followed each other without cessation to admire the results of the marvellous process. Among the pictures was a head of Jupiter Olympius, a view of the Tuileries, a view of Notre Dame, and several interiors, of which the effect, the truth, and the perfection exceeded all that they could anticipate. The conclusions of the report could not be supported by a more powerful argument." In the *Moniteur* of July 10, 1839, I find that, in the Chamber of Deputies, 237 voted for the awarding of the pensions, and three against. There were three black balls. There was no discussion.

As regards Bayard's exhibition of paper photographs about a week later, it took place at No. 16, Rue de Jeûneurs, at an Exhibition which opened on July 14, 1839, for the benefit of the sufferers by the earthquake at Martinique. The following sentence about the Exhibition, printed in the *Moniteur Universel* of July 22, 1839, is translated by me direct from an original number of the *Moniteur* of that date: "In fine, that nothing curious shall be wanting in this collection, in a great frame are exhibited several essays at photogenic or photographic pictures, which have been obtained upon paper by the aid of the camera, and which have been produced by a process other than that of M. Daguerre. These essays are of good augury; if they do not reproduce the colours of objects, if they leave something to desire in the matter of perspective, they indicate at least that the refractive operation invented by M. Bayard should be susceptible of rapid improvement, and people are already astonished at the truth of the reduced forms presented, in a subdued light, by the objects transferred to the paper."

The remark about "colours" in the preceding paragraph is an instance of the feeling abroad everywhere at that day, that it was the mission of the pioneers of photography to "fix the images of the camera obscura," colours and all. As Bayard was the first to display photographs at an exhibition open to the general public, it may be as well to mention that he exhibited no less than thirty prints in his frame.

Neither of the two earliest exhibitors published their processes at the time, some weeks passed before Daguerre and Bayard publicly revealed their methods. Bayard's process was that he prepared a surface of chloride of silver on paper by means of a two per cent. solution of chloride of ammonium, with subsequent drying, followed by sensitising upon a bath of a ten per cent. solution of nitrate of silver. The paper was then exposed to light until it became black all over, after which it was washed in several changes of water, and preserved in a portfolio until required for use. To sensitise it, a four per cent. solution of iodide of potassium was applied, and the paper exposed in the camera. Iodine was liberated wherever the light acted, and, entering into combination with the silver, formed an image in iodide of silver, which was dissolved in the fixing solution, which consisted of diluted ammonia. In this way a positive picture on paper, with its sides reversed, was produced in the camera. An authoritative official report of the time said that Bayard's photographs were good in their gradation of tints, and to artists looked like designs of the old masters a little degraded by time. Most of these, which were freely circulated by hand, presented no sensible alteration after the lapse of two or three months.

Bayard's claims were promptly investigated at Paris. The report just mentioned was that of the Royal Academy of Fine Arts of the Institute of France, which was read and adopted at a meeting of the Academy held November 2, 1839, and published in the *Moniteur Universel* of November 13, 1839. The *Moniteur* is a good authority for reference in historical matters, because it deals only with official affairs of State and other high-class matters occurring at the time. The report, which was a long one, among other items set forth about Bayard that, on May 13, 1839, after branching off in his experiments from Talbot's process, he submitted some of his photographic results to Biot, and, on May 20, still better results to Arago. Still later, he put the thirty of his proofs on public view for the benefit of the sufferers by the Martinique earthquake. The report states that Bayard held a modest position in the Government service, that he had little time or money at his disposal, and that, after the public exhibition of his photographs, he received from the Minister of the Interior 600 francs, with which he bought a better lens and camera; also that, unlike Talbot, he could get direct positives without the intervention of a negative. This report, which finally recommended Bayard to the attention and generosity of the Government, was drawn up by the Committee, which consisted of Messrs. Picot and Schnetz, painters; Ramey and Petitot, sculptors; Dehret and Guénepin, architects; and Desnoyers and Richomme, engravers. It was adopted by the Academy, and certified by Raoul-Rochette, permanent Secretary.

Bayard's process seems likely to initiate useful modifications at the present time in the easy production of reversed negatives. Sometimes it is now said in joke that the best place for backings to prevent halation is on the front of the plate, meaning the use of a thick coating of emulsion. Perhaps, on Bayard's principle, something of the kind may hereafter be done in a more literal sense. It should be remembered that there are two kinds of halation, and that one of them is due to reflection among the particles of silver haloid in the film itself. Perhaps something of especial benefit in astronomical photography may hereafter be evolved from Bayard's principle. Who knows but that it may hereafter lead to the production of a new class of dry plates, which can be freely exposed to light, and, when required for use, sensitised by an alcoholic or other volatile liquid containing a haloid salt, to enable the redrying to be effected quickly?

Finally, some researches which, so far as I know, have been forgotten everywhere, are those of John Mercer, the self-taught Lancashire chemist, who toned photographic iron prints with vegetable dyes. Among photographic dyes three stand out in relief in the matter of permanency, namely, alizarine red, indigo blue, and aniline black. If any prints could be produced with dark parts containing a substantial deposit of aniline black, which was not the case with Willis's aniline process, I think that they would be practically as permanent as platinum prints themselves. I have once or twice tried to produce an aniline black process and failed.

John Mercer was born February 21, 1791, at Dean, near Blackburn, Lancashire; he died November 30, 1866, and was buried at St. Bartholomew's Church, Great Harwood, Lancashire. He had the honour of being elected a Fellow of the Royal Society in 1852 for his labours in chemistry. He was also an F.C.S., which is not of much account as a guarantee of a knowledge of chemistry, just as F.R.P.S. is no guarantee of proficiency in photography; both mean nothing more nor less than that the individual is able and willing to pay his one or two guineas annual subscription to the Society. To be a F.I.C., or Fellow of the Chemical Institute, *is* a guarantee of proficiency in chemistry in some direction. The vanity is often harmless when an individual sticks certain letters of the alphabet after his own name, except when it is done regularly in the ordinary way of business, and with intention of deceiving the public into the belief that he is a recognised man of science, possessing special qualifications above that of paying a trifling annual subscription. About a year ago, perhaps two, a strong party arose in the Chemical Society in favour of henceforth demanding real chemical qualifications in new members, and it exerted some practical temporary influence in that direction; but, when a society has once admitted a large number of persons who are not experts, it seems impossible to change it into another class of organization afterwards, because it cannot turn out those already elected, what schoolboys call "the duffers." There are several good scientific societies demanding no ability beyond that of paying a small annual subscription, and I have not seen that the system does any practical harm, except when some of the Fellows use their membership for the purpose of deceiving the outside public as to their scientific qualifications. About the cheapest way for a man to obtain authority to put letters after his name is to send a stated sum annually to Mr. Hay Taylor, who will then allow him to put after his name "S.M.L.J.," which means "Subscriber to the *Magic Lantern Journal*." One lantern lecturer could scarcely believe this generous offer to be real, and wrote to Mr. Taylor to ask if he actually meant it.

But this is a digression, useful, however, at the present time, and we may now return to Mercer. The sensitive iron salt he usually employed was ferric oxalate, and the general principle upon which he worked was to decompose his blue prints by means of a solution of lime, or of an alkali, to get an image in ferric oxide, which acted as mordant in relation to a large number of vegetable dyes, so that he could colour his prints with many ordinary dyeing solutions. In dyeing with madder he obtained purple prints, and in this case preferred not to alter his blue prints previously. At the British Association at Leeds, in 1858, he exhibited many of his differently coloured photographs; he also sent various specimens of his coloured prints on cambric to the Photographic Society of Vienna. He worked up some of his iron processes to such rapidity that he could get prints by an exposure of twenty seconds on a dull, rainy day. He carried on a tolerably regular correspondence about his experiments with Dr. Lyon Playfair, and the latter once delivered a lecture at the Royal Institution about Mercer's researches. Details about Mercer's

photographic and other researches will be found in *The Life and Labours of John Mercer*, by Edward A. Parnell (London: Longmans. 1886). This book should be in every photographic library, especially in those of Lancashire, a county which contains the two strongest British photographic organizations out of London. Moreover, it almost needs a Lancashire man to interpret some of his formulæ, which are given in terms of the cotton-printing industry, so that we read therein about such things as "gills" and "spoons" of solutions, and strengths are often given in terms of Twaddell's hydrometer. His researches seem to present a good basis for future work, which might well be performed in Lancashire by the light of present-day knowledge, so that from the beginning to the end any processes built upon the foundation which he has laid shall all bear the Lancashire stamp. W. H. Harrison.

THE SHREWSBURY CONVENTION.

The meeting of the Photographic Convention of the United Kingdom, at Shrewsbury, will take place in the week commencing July 15 next.

At the last meeting of the Convention Council it was agreed:—

1. That so far as the funds of the Convention permit grants be made, at the discretion of the Council, in aid of the expenses of original investigations relating to photography.

2. That the Council award in each year a medal for the most important contribution to the progress of photography made during the year. It shall be at the discretion of the Council to withhold the medal if no discovery or paper is regarded as being of sufficient merit.

The following excursions have been suggested:—

(1.) Chiefly architectural subjects. Buildwas and Wenlock Abbeys, by road, the party being divided, and meeting at Wenlock for luncheon, and returning in the reverse direction.

(2.) Chiefly landscapes. Church Stretton, half-hour's journey by rail. (N. Wales in miniature.)

(3.) Landscape and architecture. Three-quarters of an hour's journey by rail to Ludlow Castle, church, and town, with fine river subjects. Mr. H. P. Robinson, who is a native of this district, will be one of the leaders.

(4.) Landscape and architectural subjects. One hour by rail. Bridgnorth and the Severn Valley.

(5.) Landscape and architectural. Circular drive to Berrington, Acton Bucknell, Wroxeter (the Roman City of Uriconium), Pitchford, and Condover Hall.

(6.) Stokesay Castle, church, and manor-house, the latter being the first example of thirteenth century work (untouched) in the kingdom. Chiefly architectural work with bits on the river.

(7.) Landscape and architectural subjects. Three-quarters of an hour rail to Welshpool, Powis Castle and Park.

(8.) Chiefly landscape. The Shropshire meres, including Ellesmere and Whittington Castle.

(9.) Special Saturday excursion. Llangollen.

PHOTOGRAPHIC EXHIBITION AT THE BIRMINGHAM AND MIDLAND INSTITUTE.

The Exhibition illustrating recent advances in colour photography, arranged by Dr. Hall-Edwards, for the *Conversazione* of the above Institute, took place last week, and, notwithstanding the absence of the Lumière negatives (which we hear have gone astray upon the *Chemin-de-fer*), was a complete success. No trouble or expense had been spared to render it as complete as possible. The room was most effectively decorated, and the electric light was used for all purposes, even the lantern-slide exhibition frames being illuminated by lamps placed beneath them. The optical lantern had its arc light, and a special lamp of 3000 candle power had been provided for lighting up the Lumière negatives. The switches were all under the control of an assistant, and the magical way in which they were manipulated was a surprise to many.

On the afternoon of Thursday, January 17, a special demonstration was given to photographers; this was well attended. Among those present were Mr. Leon Warnerke, Prof. Allen, Prof. Woodward, Drs. Hill-Norris and Lawson Tait; Councillor Martineau, Mr. G. F. Lyndon, J.P., Messrs. Whitworth Wallis, Chas. Rowe, Smedley Aston, C. Jevons Fowler, J. Beaufort, A. B. Chamberlain, E. Underwood, and many others. Sir J. B. Stone was unable to be present on account of his having to lecture at Liverpool.

The exhibits were effectively arranged, and comprised specimen prints showing correct rendering of colour values exhibited by Messrs. Fuerst Brothers, 17 Philpot-lane, London. These prints are made from negatives taken upon Lumière's colour-sensitive plates.

Set of prints, from coloured diagrams and pictures, showing comparative results in the rendering of colour values by differently prepared plates. Prepared and exhibited by Dr. Hall-Edwards.

These called forth a great amount of interest, as one was able to see, almost at a glance, the varying capabilities of the various plates.

Specimens of photo-chromotype in three workings.

Specimens of chromo work from blocks produced by photo process.

Set of blocks used in the production of coloured picture, in three workings.

Set of blocks used for producing coloured picture in six workings. Lent by Messrs. Rathby, Lawrence, & Co., De Montford Press, Leicester.

Bierstadt collotype colour prints.

Chromo-gelatine prints.

Prints by Macfarlane Anderson's process.

Colour pictures in three and four printings, &c. Lent by Mr. H. Snowden Ward.

Specimens of photo-colour prints. Lent by Mr. E. J. Wall.

Photographic prints and lantern slides, showing the advantages of using isochromatic plates. Lent by Messrs. B. J. Edwards & Co., The Grove, Hackney, London.

Photographic prints, showing various colours produced by chemical means. Prepared and exhibited by Dr. Hall-Edwards.

The electrical optical lantern. In this lantern the limelight was replaced by an arc lamp. Exhibited by Mr. C. S. Baynton, New-street, Birmingham.

Stereo-micrographs. Exhibited by Mr. Fredk. Iles. These slides illustrate a new departure in photo-micrography, showing the general structure and detail of microscopic objects, and of sections, in solid relief and not merely as plane surfaces. An inspection of the two slides of "fat cells" will show this difference most clearly, (A) representing the subject photographed by ordinary illumination, and (B) the same subject taken stereographically.

The stereoscopic slides (by the conjunction of two dissimilar images) exhibit this solid appearance still more distinctly, the effect being increased by the usual abnormal perspective obtained by the use of the stereoscope.

Photo-micrographs. Exhibited by Mr. Fredk. Iles. Lantern slides and prints of various microscopic objects, sections, &c., taken by means of the Scientific Research Photo-microscope.

Photochrome prints. Lent by Messrs. Kenworthy & Bailey, Martineau-street, Birmingham.

Lantern slides of beautiful capillary and cohesion figures. Exhibited by Dr. Hall-Edwards. (The method of preparing these was demonstated at intervals during the evening.)

A large amount of trouble and expense had been expended in arranging for the exhibition of the Lumière negatives, and much sympathy was expressed for Dr. Hall-Edwards in his disappointment.

The special arc lamp was lent by the Walsall Electrical Company, Ltd.; the portrait lens by Messrs Ross & Co., 111, New Bond-street, London, W.; and the electric current supplied by the Birmingham Electric Supply Co.

During the afternoon, Mr. Charles L. Burdick, of Farringdon-avenue, E.C., gave a demonstration of the capabilities of the *Fountain Air Brush*. The artistic and skilful manner in which he manipulated the instrument was a source of great delight.

Dr. Hall-Edwards, in a short address, expressed his regret that the chief exhibit should have been lost in transit, and that, in consequence, he was unable to deliver the lecture he had prepared. He announced, however, that the colour pictures had been definitely promised upon an early date, when he would fulfil his part of the contract.

A demonstration was given with the electric lantern, and the manner of projecting the colour negatives was fully demonstrated.

That the meeting was a great success, was proved by the flattering remarks of the visitors, Mr. Warnerke testifying to the great pleasure he had derived from his visit.

Our Editorial Table.

Formstecher's Collodio-chloride Paper.

C. A. Rudowsky, 3, Guildhall Chambers, E.C.

Mr. Rudowsky has sent us samples of this paper, which we have tried and find to give exceedingly good and brilliant results. It is amenable to toning by any of the ordinary baths, although the following one is specially recommended:—

Solution I.

Water	50 ounces.
Acetate of soda (dissolved)	2½ „

Solution II.

Water	50 ounces.
Sulphocyanide of potassium	1 ounce.

Solution III.

Water	3½ ounces.
Chloride of gold	15 grains.

Then mix together—

Solution I.	20 ounces.
Solution II.	5 „
Solution III.	1 ounce.

This bath must ripen three or four hours before it can be used. The temperature must be also 60° Fahr.

Studio Appointments.

London: Iliffe & Son.

This is a systematically arranged calendar for every day in the year, starting at ten o'clock each morning, and terminating at six, with quarter-hours intervening, one line being devoted to each on which to enter the appointment. The book, which sells at 1*s.* 6*d.*, must prove of great value to the professional portrait photographer.

Photographic Supplements to the "Graphic."

Where, in this country, is one to look for high-class pictorial art, if not in the *Graphic?* When the announcement was made that our weekly contemporary was to offer substantial prizes for the best artistic works in photography which were sent in, we felt that not only would there be a generous response, but that we should eventually see some good pictures as a result. Three cash prizes, afterwards increased to five, respectively representing 20*l.*, 10*l.*, 5*l.*, and two of 2*l.* 10*s.*, were competed for by 15,000 amateurs; at any rate, this number of pictures were sent in. The first prize has been carried off by Mrs. S. F. Clarke, of Louth, for her picture, *After Mass,* in which two smiling girls of the better-class peasantry are exchanging pleasantnesses. In this the posing, lighting, and general treatment are unusually good. The second prize of 10*l.* goes to Mr. E. Baynes Rock, Wimbledon, for a clever lamplight study, entitled *Reverie,* in which a young lady is seen leaning back in an armchair, lighted by the petroleum lamp on the table. The exposure must have been unusually long in order to have secured such an excellent effect. The third prize, 5*l.*, has been awarded to Colonel R. W. Stewart for a panoramic view of Lucerne, which has not yet been published. The two additional prizes have been carried off by Mr. Walter R. Cassels, for *One too Many,* and by the Marquis de Alfarras, for *Tossed in the Blanket.* Twenty-six pictures have been published in the two supplements already issued; two more parts remain to be issued.

Lens Work for Amateurs.

By Henry Orford. London: Whittaker & Co.

We have often wondered how it was that, while many photographers will not shun entering upon sometimes abstruse chemical research, the number of those who devote an occasional day or more to optical work is exceedingly few. It is probable that this arises more from want of hints as to the requisite special manipulation than from mechanical inability. The non-possession of the numerous tools required may also prove a factor in determining the paucity of those who engage in what must ever prove a fascinating study.

So far as regards information as to the procedure of lens-making, Mr. Orford, in the book now before us, gives the amateur such plain directions that it seems scarcely possible, under such tuition, to go astray, and, step by step, he leads him to take a piece of raw glass, and eventually turn it out as a finished lens. So far as we can perceive, he holds back nothing, but talks about so-called shop secrets as if they were, or ought to be, known to every one. The first ninety-six pages are devoted to photographic lenses, including the method of making cells and mounts, and even Iris diaphragms.

The lenses for the eyepieces and objectives of microscopes and telescopes, the working of prisms, and the testing of finished lenses are all treated in a practical manner, showing that the author is both a sound, practical optician, and is able to convey his knowledge to others in a clear manner.

The book contains no fewe than 231 illustrations, and can be strongly recommended—225 pages, price 3*s.* 6*d.*

The Strand Magazine.

The article entitled "Some Curiosities of Modern Photography," by William G. Fitzgerald, will prove interesting reading to the non-photographic public, who, in a popular manner, are informed of capabilities in photography of which most of them never dreamed, such as its agency in detecting murder, in forging bank notes, its application to microscopical research, and several other things. As the conclusion of the article has not yet been published, further notice will be reserved. The always interesting series of Portraits of Celebrities at different times of their lives embrace four of Mr. J. W. Comyns Carr, four of Lord George Hamilton, four of the late Bishop of Colchester, five of Miss Helen Gladstone, and four of the present Lord Mayor of London. The stories and sketches are as good and varied as ever.

News and Notes.

The optical works of C. P. Goerz, Schoeneberg, near Berlin, the maker of the double anastigmats, have just finished the 20,000th photographic lens made in this workshop.

The death is announced of Commandant H. Fourtier, a well-known French writer on photography. His last work, *Les Lumières Artificielles en Photographie,* has only just been issued.

We are sorry to learn of the death of Mr. F. J. Vergara, at one time well known in connexion with the film and dark slide called after his name. The deceased was fifty-five years of age.

The Platinotype Company write: "Alteration of name of Charlotte-street.—By order of the London County Council the name of Charlotte-street is to be abolished, and to be known in future as Bloomsbury-street, of which it is at present a continuation. Our address will therefore be in future—22, Bloomsbury-street, New Oxford-street, W.C."

Mr. J. H. Avery, of 45, Prince of Wales-road, Kentish Town, N.W., writes: "I beg to draw your attention to the fact that Mr. George Gosling has resigned the post of Hon. Secretary to the North Middlesex Photographic Society, meeting at Jubilee Hall, Hornsey-road, N. All communications for the Society should be addressed to me in future at the above address."

Readjustment of the Literary Postal Club (Established 1887).—There are vacancies in the above-named Club for eight or ten members. Persons wishing to join are requested to send a specimen print, as only good workers will be admitted. Annual subscription, 1*s.*; entrance fee, 1*s.* The object of the Club will be maintained, viz., photographs to be of literary interest, *i.e.*, of places which are of historic association, interesting in themselves or have been rendered celebrated by eminent persons. The Hon. Secretary is Mr. John W. Dawes, Holloway, near Matlock, Derbyshire.

Sir David Salomons, the well-known amateur photographer, who is Mayor of Tunbridge Wells for the year, gave a banquet at that place on Saturday week, when, besides the Lord Mayor of London and other notabilities, several local photographers were present. These included Mr. H. P. Robinson, Mr. G. Glanville, and Mr. P. Lankester, and the following members of the local Amateur Society, of which Sir David is patron:—Rev. A. T. Scott, Mr. Councillor Brindle, Mr. Whitrow, Mr. Catchpole, and Mr. Joseph Chamberlain (Hon. Secretary). Mr. Lankester took a flashlight photograph of the banquet on a Mawson plate by the aid of sixteen flash lamps arranged by Mr. F. W. Hart, the candle power being said to be equal to 80,000.

Photographic Club.—The Annual Lantern and Musical Entertainment (Ladies' Night) has been arranged for Wednesday, February 13, at eight o'clock. As on previous occasions, in order to ensure the comfort of the visitors, the Committee have decided to issue only a limited number of tickets; also, that admission for both members and visitors shall be by ticket only. Tickets will be sent only to those members who apply for them. After Tuesday, February 5, all unappropriated tickets will be distributed to members who may require them. It is desirable that as many members as possible should contribute slides on this, the most important Lantern Meeting of the season. If members have any they would like exhibited, they are to send them to Anderton's Hotel not later than Wednesday, February 6, or to Mr. James A. Sinclair, (Hon. Secretary and Treasurer), 26, Charing Cross-road, by February 7, for selection by the Sub-committee. No slides can be shown on the Ladies' Night unless they are delivered by the dates named.

Burglary at a Photographer's in Lynn.—A daring burglary was perpetrated some time on Tuesday night, January 15, or during the early hours of Wednesday morning, on the premises of Messrs. T. Smith & Sons, photographers, High-street, when a number of lenses, varying in value from 20*l.* to five or six guineas, and other parts connected with them, in fact, the very essence of a photographic plant, to the value of considerably over 100*l.*, were stolen. It appears that the thief or thieves effected an entrance from Surrey-street, getting into Mr. Skinner's yard, where they found a ladder, and, placing it against a shed, climbed on to the roof which runs up to the window of Messrs. Smith's operating room. They took one large pane of glass out, measuring twenty-four inches by sixteen inches, and, it seems, the professional precaution was taken beforehand of spreading treacle and brown paper over the glass to deaden the sound before smashing it. From the operating room they took some lenses, instantaneous shutters, &c., leaving the place in great disorder. The dark room was entered, but, strange to say, not by the door which had been used lately, and, by the way, had the words "Dressing-room" painted on the outside, but by a door in a dark corner of the operating room, which had been closed and unused for some weeks, and which was totally hidden by large pieces of background. This raises the belief that the intruders were acquainted with the premises, as also does the fact that the door, which will not stand open unless fastened back, was found held open by a piece of string attached to the wall behind the door being put round the knob, and which was formerly used for that purpose. From this room they removed several things, and also climbed up into the printing room, where they carried off the contents of five tin boxes, which contained exceptionally valuable lenses, worth 80*l.* Every other lens

in the room was taken, including a large magic-lantern lens, which had been removed from a box underneath a bench, the lantern being left on the bench, with the exception of an old French lens, practically worthless, and a lens on a small amateur camera in a corner of the room, which had also not been touched. The finishing room lies at the end of the printing room, and is immediately over Mr. and Mrs. Smith's bedroom, but this room, it appears, was not entered. If it had been, although Mr. Smith suffers from deafness and probably might not have heard the thieves, Mrs. Smith would most likely have been alarmed. The burglary was first discovered on Wednesday morning.

Affiliation of Photographic Societies.—Annual General Meeting of Delegates at 50, Great Russell-street, W.C., on Friday, January 11, 1895, Mr. Clifton (Photographic Club, Chairman) presiding.—A letter was read from the General Manager of the American Lantern Slide Interchange, asking for an exchange of a set of slides. It was proposed by Mr. Bridge (Photographic Club), seconded by Mr. F. W. Edwards (South London Photographic Society), and carried, "That the Committee accede to the wishes of Mr. Beach, and endeavour to form a collection for the purpose. The Director to be requested as far as possible to see that the slides are not copied." It was agreed that the Societies should be invited to send in not exceeding twelve slides each, from which a selection should be made for the purpose. The Chairman's report was read and adopted. The balance-sheet, showing a balance in hand of 36*l.* 14*s.* 5*d.*, was read and adopted. With reference to the Rules drawn up by the Conference of Judges, it was agreed to ask the Chairman of the last Conference to give his definition of Rules 7 and 10, and that these definitions should be appended to the Rules. The election of officers then took place, Mr. E. Clifton, Chairman, Mr. G. Scamell, Treasurer, Mr. Everitt (London and Provincial Photographic Association), and Mr. Marchant (North Middlesex Photographic Society), Auditors, being unanimously re-elected. A vote of thanks to the officers for their past services was proposed by Mr. Edwards, seconded by Mr. Bickerton (Richmond Camera Club), and carried with applause. The report of the Committee on technical lectures was then read. The Committee recommend that two lectures be arranged on the subject of *The Physics and the Chemistry of Development*, and that Mr. Thomas Bolas, F.I.C., F.C.S., be asked to deliver the same. They recommend also, amongst other matters, that an endeavour be made to secure the use once more of the Cordwainers' Hall for the purpose. The report was adopted, and the Committee reappointed to carry out the lectures. It was proposed by Mr. Coventon (North London Photographic Society), seconded by Mr. Bickerton, and carried, "That the forthcoming lectures by Mr. Bolas be printed and bound in stiff paper covers for the use of the Societies." It was also arranged that an estimate should be obtained for reprinting the two previous series of lectures. It was proposed by Mr. Marchant, seconded by Mr. Everitt, and carried unanimously, "That an honorarium be voted to Mr. Bayley, the Secretary." The amount was fixed at ten guineas. A number of replies from the various Societies in answer to the request of the Chairman for suggestions were read, and it was agreed that a *précis* of these suggestions, and any others that may come to hand in time, be drawn up and circulated with the notice of the next meeting, which should be held in about a month's time.

A Photographic Expedition in Algeria.—Armed with Harris's *Practical Guide* and Murray's *Handbook to Algeria*, a large battery of lenses, a stereoscopic camera, a No. 4 Kodak, and twelve dozen plates, I set out the other day from Algiers, "'midst thunder, lightning, and heavy rain," *en route* for Biskra and the Desert, little thinking that I was going from bad weather into worse. Yet I noticed some extraordinary weather transformations and atmospheric changes which amply repaid me for my inconvenience. The magnificent sunsets—I say sunsets, for I witnessed several each day—the sun first appears to set, and, as the train speeds on, it seems to set again over a lower mountain, lighting up the hills and vales with such splendid hues, that verily it would have "warmed the cockles of Turner's heart." The contour of the snow-capped peaks reminded me of the New Zealand Alps, but the verdure was absent. On arriving at Setif I found the road "a slough of Despond." A well-stocked dinner at the Hotel de France soon put matters on a better footing. Sleep was not in store for me. What with music from a Café Chantant immediately underneath, some giggling, chattering ladies in the next room, I dozed off several times, awaking suddenly with sounds resembling those of a roaring lion. This extraordinary noise was nothing more or less than the double-bass, sonorous snoring of a heavy sleeper in the adjoining room. Then came the call of a bugle and drum to usher in the New Year. A rat-tat at the door with my boots; this was to inform me that the omnibus would start earlier on account of the slippery state of the road, a sharp frost having set in during the night and frozen everything. I was thus deprived of a visit to the town. The same sort of weather prevailed all the way to Biskra. I made a snap-shot from the carriage window at a group of Arabs who were waiting for the arrival of the train for their bread. By their manner of eating, or rather swallowing, their meal, I formed an idea that it had been long overdue. I wired to the Royal Hotel for accommodation for me and party (five); but, to my surprise, I found, on my arrival at the Biskra railway station, neither omnibus nor hotel porter to advise me of anything. It was only after driving to the above-named hotel, in a chance vehicle that I collared on the road, that I was informed that the hotel was full. The manager, it appears, had not the common politeness to send that information to the station. We found excellent accommodation, nevertheless, at the Hotel Victoria, and, from subsequent observation, I was not sorry of the occurrence. I started early to photograph the public buildings, &c., and later on got some characteristic studies of old Biskra. Next day I transferred the seat of my operations to Sidi Okba, where I got some fine pictures. I have on a former occasion referred to the superstitious dread the Arabs have of being portraitured. By a little manœuvring I succeeded in attaining my aim, though. At night I visited the Ouled Naïl dancers; but, as the performance appeared to me very tame and ungraceful, I was rather disappointed in my expectations. Their dance is nothing compared to that of the Maories or aborigines of Australia. Leaving Biskra, my next halt was at Batna, whence I drove to Lambessa and Timgad, where I exposed a dozen plates on the wondrous Roman Ruins. The elements were very much against me; the wind blew a hurricane, and, before my operations were completed, a heavy snowstorm came on, and I had serious doubts whether I could reach the hotel. Happily, the proprietor had the wise idea of sending us a couple of horses extra (making five in all), and we got safely back in time for dinner. When one considers the altitude of Timgad (3350 feet), one must not be surprised at the cold weather we experienced. My next field of operation was at Constantine. This place is marvellous for situation and beauty, and, as an old traveller, I can state with confidence that it cannot be surpassed by any other city in Algeria. My ammunition being exhausted, having taken altogether over 140 negatives during my journey, I made tracks back to Algiers to develop the results. I am highly pleased with my interesting and instructive excursion, which I intend to renew on a second visit one of these days.—A. L. Henderson in the *Algiers Atlas*.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

January.	Name of Society.	Subject.
28	Camera Club	
28	Lantern Society	
28	North Middlesex	
28	Putney	
28	Richmond	*Metol as a Developer.* Mr. Williams.
29	Birmingham Photo. Society	
29	Brixton and Clapham	*Printing on Bromide Paper.* F. W. Kent.
29	Hackney	*Travels with my Camera.* Mrs. Weed-Ward.
29	Lancaster	
29	Leith	
29	Munster	*Flashlight for Photography.* G. Percival
29	Paisley	
29	Rochester	
29	Warrington	
30	Bath	
30	Burnley	
30	Croydon Camera Club	Great Lantern Show.—*Due South with a Pocket Camera.* E. Bullin, F.R.G.S.
30	Leytonstone	
30	Midland	*Carbon Printing.* Dr. Hall-Edwards, L.R.C.P.
30	Photographic Club	*Norway.* F. A. Bridge and A. Bridgman.
30	Southport	*Ten Days at Lucerne and Country Round.* H. J. Heaton.
31	Ashton-under-Lyne	*Development: Pyro-ammonia, Amidol, Hydroquinone, and Eikonogen.* Messrs. Cheyne, Chadwick, Glazebrook, and Woolley.
31	Camera Club	*On Decorative Bookbinding.* Cyril Davenport, F.S.A.
31	Dublin Y.M.C.A. Camera Club	*A Trip to Antwerp.* G. M. Roche.
31	Ealing	*Photogravures, and How they are Made.* A. Ernest Smith.
31	Glossop Dale	
31	Halifax Photo. Club	
31	Hull	
31	Liverpool Amateur	*The Avon and Shakespeare Country.* Dr. J. W. Ellis, F.E.S.
31	London and Provincial	*Photomechanical Work in Japan.* W. K. Burton.
31	Oldham	Social Technical Meeting. *Toning.*
31	West London	
February.		
1	Brighton and Sussex	
1	Cardiff	
1	Croydon Microscopical	
1	Holborn	
1	Leamington	
1	Leigh	Prize Slides.
1	Maidstone	
1	North Kent	
2	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

January 22,—Technical Meeting,—Mr. Horace Wilmer in the chair.

Mr. H. Snowden Ward showed several half-tone prints by the Chemigraphic Engraving Company, New York. Some of them were produced by double printing in two inks. The grain appeared to be very fine, but Mr. Ward could give no particulars of the process. He also showed four proofs printed from half-tone zinc blocks, no screen or dusting-box, it was alleged, having been used in the graining.

The Chairman passed round for the inspection of members an album of about eighty-one Talbotypes which the Society had recently acquired. The book, which was produced in 1843, contained, it was believed, many pictures produced by Talbot himself. They were chiefly of architectural subjects in London, Oxford, Cambridge, &c.

Control over Results in Development.

Mr. Alfred Watkins read a lengthy paper on this subject, in which he described many experiments confirmatory of his previously published theories. He illustrated the claim that the ratio of the time of appearance of three tones in the negative remains constant, whatever modification is made in the developer, by giving the relative time of appearance of two tones in eight consecutive trials on landscape and sensitometer exposures, with a normal developer of pyro, 2 grains; bromide, 1 grain; soda, 12 grains; compared with Edwards's strong formula of pyro, 8 grains: bromide, 16 grains; soda, 70 grains. Reducing the actual time of appearance to a common denominator of 1 for the first tone, it was found that the average result of eight experiments showed

that the ratio of time of appearance was identical with the two widely different developers. Citrate of soda, which had the reputed power of holding back detail, did not alter the ratio of time of appearance of highest and lowest tones, as the record of seven sensitometer trials showed. Several experiments were then described, showing that variations in the amount of pyro and alkali had no effect beyond altering time of appearance. Preliminary soaking of under-exposed plates did not bring out detail or hold back the high lights, and tentative development did not alter gradation. In the case of over-exposure, strong and dilute developers gave results printably identical. After describing other experiments, Mr. Watkins referred to one illustrating his theory, that where fogging action takes place with one developer and not with another, a change of gradation took place, the deposit of fog being apparently greater in the lower tones than in the higher. It was the normal developer which by fogging altered the gradation, and it was impossible to compare the gradation-giving capacity of two developers if fog was present in one case and not in the other. As regards the multiplying factor, this varied with the amount of pyro, and probably in accordance with a definite rule, an indication of which he gave. Any increase in the amount of bromide lessened the multiplying factor, although it had no power to alter gradation. Comparing metol (on account of its rapidity) with hydroquinone, no sign of change of gradation was observed. Mr. Watkins concluded his paper by giving the following table of multiplying factors as a rough guide :—

Multiplying Factors.

	Factor.
Pyro-soda ½ grain pyro to ounce	10
,, 1 ,, ,, ,,	6
,, 2 ,, ,, ,,	4
,, 3 ,, ,, ,,	3½
,, 4 ,, ,, ,,	3
,, 8 ,, ,, ,,	2½
Hydroquinone, caustic soda	3½
Eikonogen, carbonate potash	5
Metol, carbonate soda	16
Glycin	8
Amidol, 2 grains to ounce	10
,, 4 ,, ,,	6
Velox	7

Mr. B. J. Edwards was glad to see that Mr. Watkins had modified some of his previously published statements, and had admitted that the photographer had more control over his results than simply time of development. Mr. Watkins stated that there was a great difference due to fog; but he (Mr. Edwards) thought exposure had something to do with the result. He was prepared to expose a negative for twenty or thirty times the normal period, and yet would produce a result that gave good prints. In such a case, where the image instantly flashed out, what became of the multiplying factor? He (Mr. Edwards) would use a developer suited to the exposure. There was no such thing as "correct" exposure; it was simply a case of the developer being suited to the exposure given. As to Mr. Watkins's allegation that fog altered the ratios, and had a discriminating action by depositing more on the shadows than on the high lights, he thought the fog deposit would be equal all over the plate. Mr. Edwards concluded by showing comparative results, exposed under graduated tests, in which, by employing normal against restrained development, the gradations were altered and the lower tones kept back.

Mr. W. E. Debenham pointed out that in the case where fog was supposed to have altered the gradation, it was due to the difference in the power of the developer. In one case development had simply been pushed to the fogging point, and in the other case it had not. Mr. Watkins admitted that, in cases of great over-exposure, control over the results might be had. As to the range of light values in nature being taken as 1 : 25 by Mr. Watkins, he (Mr. Debenham) was of opinion that the scale was longer, notably where dark leaves or trees in shadow appeared. One method of control in development had not been noticed, namely, that suggested years ago by Mr. W. B. Bolton for over-exposure. This consisted of washing off the developer, flooding the plate with bromide solution, and then recontinuing development.

After remarks by Mr. Mackie,

Mr. F. Ince quoted some experiments made by himself years ago proving that, when more than three grains of pyro per ounce of developer were used, the remaining quantity of pyro was simply so much waste.

Mr. Chapman Jones thought Mr. Watkins's work was valuable as tending to show the existence of certain principles, although, like Messrs. Hurter & Driffield, Mr. Watkins possibly generalised too much. He (Mr. Jones) was of opinion that the gradations in a negative could be altered by development and time. The action of fog as described by Mr. Watkins was a new phase. The discriminating action might be explained by the fact that exposure had not left any unaltered silver in the high lights, whereas there was plenty in the shadows. If fog had the property attributed to it, it was exceedingly valuable.

Mr. H. W. Bennett said that in practice, using a weak developer, he could never get the amount of density that a strong one gave. He showed two plates illustrating the point. One had been developing for twenty minutes, but, after considerably less than that time, no further action took place.

Mr. Watkins replied to various points raised in the discussion, and was accorded a hearty vote of thanks for his paper.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

January 17,—Mr. G. W. Austin in the chair.

Mr. A. E. Wiss was unanimously elected a member.

Mr. W. T. Wilkinson showed prints on Rivot's self-toned paper; also albumen films transferred on to glass, the films being immersed in hot water, squeegeed into contact with the glass, and the paper backing stripped as in the carbon process. Mr. Wilkinson also showed a piece of glass coated with coralline in collodion. This gave a light which, he said, could be used with all plates except isochromatics. He tested the colour in the solar spectrum, and found that it cut off all except the red.

In reply to Mr. A. Haddon, Mr. Wilkinson said that albumen paper for transfer was specially prepared.

"The Hand Camera: Then and Now."

Mr. W. D. Welford read a paper on this subject [see page 54]. In the discussion that followed,

The Chairman said that four years ago he was a member of a Society of about twenty-five members, and he was the only hand-camera man. Quite recently, fully half the members used hand cameras. Recently, in North Devon, he met an artist who always carried a hand camera with him, and subsequently made use of figures and views so obtained in his pictures. He spoke approvingly of Messrs. Adams' new finder, and said that for hand-camera work he preferred a slow developer to the new fast ones, which were not suitable.

Mr. W. E. Debenham was of opinion that there had not been so much abuse of the hand camera as Mr. Welford inferred. No doubt, Mr. Welford, as the champion of the hand camera, had taken more notice of what had been said against it than others. Having referred to Skaife's pistolgraph and Geymet & Alker's binocular camera as what had been done in the way of hand cameras in the past, Mr. Debenham said that there was another use of a hand camera which had been overlooked, and that was the making of large pictures from the small ones. Mr. S. J. Beckett's frequently medalled *View of Verona* was a case in point. He thought a level should be placed on the top of a hand camera, which should also have a rising front.

Mr. J. S. Teape said that his first hand-camera pictures were taken without the use of a finder, and they were the best he had ever done. He found that he could use a hand camera without a finder after a little practice. Such pictures were the most valuable in the grouping, as, while consulting the finder, it was often found that the figures had moved from their natural positions. Some years ago he showed six hand-camera pictures at the Photographic Society's Exhibition; they were the only hand-camera pictures there, and were not noticed. They were taken under circumstances in which he could not have used a finder. Mr. Teape was of opinion that it would be impossible to produce artistic grouping when using a stand camera.

The Chairman said he occasionally used a hand camera as he would a gun, and found he got the view all right.

Mr. Wilkinson said it was as great an art to use a hand camera well as anything in photography. It required a man well up in the work.

Mr. T. E. Freshwater considered finders a great convenience.

Mr. J. E. Hodd considered there should be two classes of hand cameras, as it was impossible with a focussing or twin-lens camera to do the same kind of work as with a fixed-focus camera, where it was not necessary to get ready to make an exposure. Most finders, he thought, were faulty as regards curvature of image, poor illumination, and not having the same focus as the lens. Most shutters, also, were too fast, and were no use in winter. He thought that rapidity should range from a second to one one-hundredth. He did not like the highest-speed plates for the work, as the grain of the emulsion showed in enlargements from the negatives. He said that glycin was his favourite hand-camera negative developer, and thought a level was superfluous, as one's hands were already full. The lens, in his opinion, should be capable of working at *f*-6. A rising front was not wanted in snap-shot work. As regards the sale of hand cameras, he stated that ten of them were sold for one stand camera.

Several members disagreed with Mr. Hodd's suggestion as to the necessity for two hand cameras.

Mr. E. H. Bayston spoke approvingly of the Alpha form of hand camera.

Mr. R. P. Drage noticed that leading workers invariably used a finder. Abroad he had found it almost impossible to take a photograph without using one. In the East, if you showed that you were taking a photograph, people shaded their eyes, as there was a prejudice against being photographed among Mohammedans, &c.

Several other members joined in the discussion, to which Mr. Welford briefly replied, being afterwards thanked for his paper.

PHOTOGRAPHIC CLUB.

January 16,—Mr. Frank Haes in the chair.

The Hon. Secretary read a letter from the President of the Société Lorraine de Photographie, in which he asked if the Photographic Club would become corresponding members of the Society.

It was proposed by Mr. Bridge, and seconded by Mr. Sinclair, that the Club accept the invitation.

Mr. Snowden Ward showed some process pictures, "Half-tone on Copper," by the Chemigraphic Company, of New York, Boston, &c. These were varnished and unvarnished prints from same plates. The unvarnished were preferred by members.

Mr. Welford presented the first instalment of several monthly and quarterly photographic magazines, for which he was heartily thanked. The said publications were much appreciated, and made a goodly show on the table.

This being an Open Night, some eighty slides were shown by Mr. Welford and Mr. Fry, the latter being from Rejlander negatives.

Croydon Camera Club.—The subject on Wednesday, the 16th, was *Skies in Prints and Slides*, and was initiated by a paper by the President (Mr. Hector Maclean, F.G.S.), in the course of which he strenuously advocated the employment, by those who wish to apply photography to the production of pictures, of "alien" clouds. The complete paper will appear next week. Following Mr. Maclean, Mr. J. Packham, F.R.H.S., gave practical illustration of printing-in of clouds in platinotype. The examples shown included several pictures exhibiting the charming results attainable by the newly discovered

toning process associated with this gentleman's name; besides the light they shed upon the procedure he advised, they were viewed with great interest on account of the vigour and variety of their tones. In conclusion, Mr. H. E. Holland expounded and demonstrated what may be done in adding a sky to a lantern plate, his manipulations attracting much attention. Altogether, the mixture of theory and practice of art and science, as applied to the particular subject, afforded a good attendance of members matter for considerable discussion, and will, no doubt, greatly raise the average of future work in the department of photography concerned with making art-pervaded pictures.

Hackney Photographic Society.—January 15, Mr. J. O. Grant presiding.—Samples of Cadett's new rapid series of "Lightning" plates were distributed for trial. Several useful contrivances were sent for exhibition at the meeting by Messrs. Pumphrey, consisting of various plate-lifters, a ball head for camera stands, a new film-holder, a reversible plate rack, and a rapid drying rack. Mr. E. J. WALL then read a very exhaustive paper on *Toning Baths*, a brief extract from which is, in effect, as follows: After referring to the necessity for toning as being caused by the fact that the printed silver image on albumenised or gelatino-chloride paper, when fixed only, is of an unpleasant colour, Mr. Wall proceeded to deal with gold toning. He said that gold chloride was a definite chemical compound, of which commercial samples might be or might not be pure. It never hardly was pure, and most of it was a double compound of gold and an alkaline chloride. As an example of what might be obtained in the market, the following were analyses of some commercial samples: No. 1 contained 52 per cent. of metallic gold. No. 2 contained 44 per cent. No. 3 contained 19 per cent. No. 4 contained 40 per cent. No. 5 contained 60 per cent. Theoretically, there should be 65·2 per cent. No. 3, which contained less than one-fourth of the right amount of gold, was a mixture of chloride of gold and chloride of sodium. A good test for the purity of gold chloride was to dissolve a crystal or two in a little pure ether. If no precipitate was formed, then the gold chloride would be pure; if otherwise, then the sample would either be an impure salt or a double salt, and neither of these should be paid for at the same rate as the pure chloride. For albumenised paper there were practically three kinds of toning bath, viz., acid, neutral, and alkaline. The purely acid bath, consisting of acid solution of gold and hypo, was not much used at the present time, it gave rise to sulphur toning. The second kind of bath was the neutral. Baths of this kind could only be formed when a neutral or neutralised solution of gold was added to a neutral salt like borax or acetate. These gave rather more purplish tones than the acid baths because the gold was deposited more rapidly and probably in a coarser state of division. The third variety of bath—the alkaline, was formed by adding excess of carbonate of soda to solution of gold. This quickly deposited the gold, and tended to give bluish tones. Those baths which toned most slowly kept in good condition for the greatest length of time, and those which toned very quickly spoiled soonest. Thus the acid bath toning slowest kept longer than either the neutral or alkaline, which last toned rapidly and spoiled quickly. Passing to gelatino-chloride paper, Mr. Wall said that the baths above mentioned could be used, but the results were not quite satisfactory, the prints generally receiving an unpleasant pinky tinge. The bath most in use was the sulphocyanide. Either the potassium or ammonium salt could be used, one grain of the latter being equal to one and one-third grains of the former. When a sulphocyanide was added to gold chloride in small quantities of water, a deep orange red precipitate was formed, which disappeared on adding more water, and which very readily dissolved in excess of sulphocyanide salt. The proper way to make such a bath was to dissolve the sulphocyanide in plenty of water, and then add the chloride of gold diluted. For example—taking the Ilford formula—Gold chloride, 2 grains; sulphocyanide, 30 grains; water, 16 ounces. The sulphocyanide should be dissolved in 14 ounces of the water, the gold solution diluted to 2 ounces, and the two solutions then mixed and shaken. Practically, the proportions of sulphocyanide to gold should be not less than four, and not more than sixty to one. If the proportion of sulphocyanide to gold was greater than sixty to one, the sulphocyanide salt would attack the gelatine. The speaker said that, personally, he was in the habit of making his bath in stock solution as follows: ½ ounce of potassium sulphocyanide was dissolved in water to make 15 drachms, this was added to 15 drachms of solution of gold (1 grain per drachm), the result being a stock solution containing 1 grain of gold in every 2 drachms. Such a solution Mr. Wall had kept in good condition for fifteen months. It was necessary to keep it in the dark because sulphocyanide of gold was sensitive to light. The addition of a chloride to the sulphocyanide bath caused rather quicker and more even toning, but it did not keep so well. Concerning the combined toning and fixing bath, Mr. Wall gave it as his opinion that this bath should not be used by the ordinary amateur; but, as there were many who had a hankering after a bath of this kind, he would give them a formula. In the first place, any combined bath might be used, so long as it did not contain acid, alum, silver, or lead salts in it. Allow a certain amount of bath to a certain number of prints, use it at once, and then throw it away. Place the prints in salt and water first, wash in running water for fifteen minutes, and then tone. A good formula was: Hypo, 8 ounces; ammonium sulphocyanide, ¾ ounce; phosphate of soda, ½ ounce; gold chloride, 15 grains; water, to 37½ ounces. Better than this was the omission of the phosphate and adding a good-sized pinch of chalk to the bath. This last kept well, and would give permanent prints if not used over again. For platinum toning the following essentials had to be borne in mind. 1st. The print must be free from all soluble silver salts, otherwise chloroplatinite of silver would be formed. This was insoluble in water, and was sensitive to light, so that the whites of the image would become tinged. 2nd. The bath must be acid, because, in the presence of an acid, the platinum salt was more readily reduced to the metallic state. 3rd. If all the soluble platinum saltswere not removed prior to fixing, a platinum hyposulphite was formed, which gave a deep tint, more or less, to the whites of the picture. 4th. The fixing bath must be alkaline, to prevent sulphurisation. Before toning with platinum, then, the prints should be washed in salt and water for about ten minutes, then washed in pure water for five minutes, and then toned. The toning bath might be of any strength, as preferred, from half a grain to four grains of chloroplatinite per ounce; it simply meant a difference in rapidity of toning. The following was a good bath: Potass chloroplatinite, 15 grains; phosphoric acid ½ ounce; distilled water, 35 ounces. This kept well in the dark, and toned quickly. A slower bath might be compounded with a three per cent. solution of boracic acid. The bath Mr. Wall recommended was the following—one of Mercier's: Potass chloroplatinite, 15 to 30 grains; lactic acid, 3 drachms; distilled water, 35 ounces. This toned rapidly, gave almost black tones with suitable negatives, kept well, and did not attack the fine details of the print. Instead of acids, acid salts, such as cream of tartar, acid phosphate of soda, &c., could be used, but they did not keep so well. Oxalates and tartrates should not be used, as they reduced the platinum. After toning, the prints should be placed in salt and water, to stop the action, then washed well for ten minutes, and then placed in a solution of carbonate of soda, two ounces to the pint; afterwards into a fixing bath of hypo, 5 ounces; sulphite, 3 ounces, salt, 1 ounce; water, 40 grains. After fixing, of course wash well. Mr. Wall then dealt with the toning of bromide prints. For this purpose ferrous oxalate should not be used to develop, as it was difficult to get rid of the iron. After fixing and washing, treat the prints to a bath to hydrogen peroxide five per cent. solution, to eliminate the last traces of hypo, and then tone in the following: Solution A.—Potass ferricyanide, 2 grains; water, 2½ ounces. Solution B.—Uranyl nitrate, 10 grains; ammonium sulphocyanide, 50 grains; glacial acetic acid, 10 drops; water, 2½ ounces. Mix in equal parts before use.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 905.—"An Apparatus to be used in connection with the Developing of Photographic Negatives." J. LEWIS.—*Dated January*, 1895.

No. 918.—"Improvements in Apparatus for Regulating the Flow of Compressed Gases." A. T. CLARKSON and J. B. SPURGE.—*Dated January*, 1895.

No. 919.—"Improvements in Spinning, Doubling, and Twisting Machinery." S. E. ASQUITH, M. LEACH, and A. PRIESTLEY.—*Dated January*, 1895.

PATENTS COMPLETED.

IMPROVEMENTS IN APPARATUS FOR USE IN TAKING PHOTOGRAPHIC PICTURES.

No. 2986. GEORGE DICKINSON, 144, Morley-avenue, Wood Green, London, N. *December* 15, 1894.

THE principal object of this invention is to provide a compact photographic apparatus in which a number of plates, films, or sensitised surfaces are placed in succession in position for receiving the photographic image, and are afterwards returned to a receptacle, in which they are retained without opening the camera or exposing the plates, films, or surfaces to light otherwise than in taking the picture.

According to my invention, I provide a suitable closed box or camera, in which a lens and shutter may be used in the ordinary way. Into this camera and opposite the lens is a rectangular frame, acting as a plate or film-holder, having projections in its inner four corners or angles, so that the sensitive sheets or plates and cardboard, or other intercepting medium, or the sensitive sheets or plates only, with or without sheaths, when placed at right angles and in opposition transversely across each other, may be supported and allowed to fall at the will of the operator by revolving or raising and lowering eccentric or alternating catches working at opposite sides or corners in such a manner that, at each movement, one of the sheets or plates is displaced, removed, and succeeded by another.

These movements may be accomplished in various ways:—

1. By eccentric or alternating catches on one of the ends of each of the projections inside the holder, all connected or geared so that they face each other in pairs, which operation may be actuated by levers, bevel-cog motion, or similar contrivance.

2. By leaves or catches on each side, and not at the corners, so arranged with springs and levers that when one pair of such catches face each other inwards, the other pair would be depressed outwards, thus liberating the top film or plate and retaining the remainder until another movement be made.

In combination with the above movements I can arrange a cover for the receptacle for exposed plates or films.

On raising this it engages with a lever which actuates the changing arrangement, and which also moves an index recording the number of film or plate brought into position and disposed of.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

QUOTATIONS.

To the EDITOR.

SIR,—A correspondent recently wrote you complaining of inaccuracy displayed by some of your contributors when quoting. Doubtless such practice is much to be condemned; but, for my part, I would beg for the editorial edict against "damnable iteration." That confounded yellow primrose, now! It turns up again in your last week's issue. Hitherto it has flourished on the river's brim; its habitation is now the river's brink, which change in no way soothes my harassed mind. Deuce take the thing! Because an eccentric primrose prefers to flourish on the river's brink, is that any reason why it should be constantly dragged

into notice? Why should it be exalted above its kin that are content to grow in sheltered woods or on the banks of shaded lanes? Then, the implied reproach that "to him" it was "nothing more." What more than a yellow primrose should it be? Does the poet expect "him" to bow down and worship it as a blue forget-me-not, a cure for corns, and a one-solution-developer all combined?—I am, yours, &c., PROSE.

January 15, 1895.

DEVELOPING GELATINE PLATES OF LINE SUBJECTS: FILMS.

To the EDITOR.

SIR,—Your leading article on *Gelatine Negatives of Line Subjects* suggests that a note of my own experience in that direction may be useful to your readers. I find that the best method to obtain the strong contrasts necessary for that class of work is to use a slow plate or film, give a long exposure, five or six times what would be required for a landscape with the same material, and develop with an *old* hydroquinone developer, *i.e.*, one that has been used and kept over. I keep all my old hydroquinone developers for such cases, or for landscapes where the exposure has been very long, and possibly too long. In the latter case the object is to proceed cautiously with the development, adding new developer if the old is too weak; but, in the former, it is necessary to ascertain by an experiment if the developer is up to the work required, and the exposure long enough for the strength required, with no excess whatever. I have made good negatives from red chalk drawings, in which the grain of the drawing acts in the same way as the lines of an engraving, and in which the strength of thr print was as great as that in the original drawing. The *rationale* is simple—it is as if we had given a short exposure with a normal developer, with the advantage that the development is severely checked by the weakness of the developer and the accumulation of bromide in it from the negatives previously developed, and the shadows, represented by the blacks of the drawing, are strongly protected. If, on the first trial, the contrast is not sufficiently great, make the exposure longer and add a little bromide and hydroquinone, but, once the formula is found, the problem becomes an easy one.

The remark of "Cosmos" on the subject of my experience with films and plates indicates that the writer has not perfectly taken my meaning. I did not say that films *could not* be made as rapid as plates, but that it is impossible to say that they could, and my grounds for saying this were that I have tried all the most rapid films in the market, so far as I can learn, and I have found none that are as rapid as plates that I have found, even when the films were new. As to the keeping qualities, all that I can say is negative, and it is that I have not yet come on a sample of rapid film that did not deteriorate, and more than plates of the same quality. But I cannot pretend to speak conclusively, for my experience has not been exhaustive, and all that I am willing to say is that I have not been able to get a sample of film that is as rapid as some rapid plates, and especially the green-label plates of Dr. Smith. When the doctor finds time to coat me some films and plates with the most rapid emulsion he can make, he will enable me to test the question in an exhaustive manner. My procedure is the following, and it will be seen that it leaves very little question of accident. I make the trial only on one of the bright Italian days, when there is no cloud in the sky, and about noon, that there may be no variation in the light. I then put a pair of plates and a pair of films in double holders, a plate and a film in each, and expose them rapidly, with a Bausch and Lomb shutter, on a subject which has great depth of shadow, and with an exposure I know from experience to be the minimum, and develop them with the same lot of developer. If the two pairs agree, the proof seems to me sufficient; if not, I try again; but in many trials I have not found a perceptible difference between the two.

As to the keeping power of films, I have already said that I have found it sufficient for all purposes; but an exact comparison, such as I can make with the plate as against the film, is clearly impossible, for an exposure of to-day cannot be rigidly compared with an exposure of this season of last year. But I have found as a general thing that old films of a good quality, where the celluloid has been well seasoned, as in the practice of Mr. Carbutt (and, I presume, of all other manufacturers), the only degeneration in two or three years of keeping is to produce a slight veil, easily kept down by a trace of bromide in the developer from the beginning; but I do give, as a safeguard, a little more exposure than I would with a new film.—I am, yours, &c., W. J. STILLMAN.

Rome, January 13.

HAENFSTANGL *VERSUS* TYLER.

To the EDITOR.

SIR,—Will you kindly permit me, through the medium of your valuable paper, to thank most heartily the many friends and customers who have sent notes of sympathy respecting the unsuccessful issue of my lawsuit? The many letters I have received from friends and customers go far to recompense the verdict of a jury who knew I had erred unwittingly and did all in my power to make amends.

The brief facts of the case are as follows:—During my visits to Switzerland and Germany, &c., I have at times seen photographs of Scripture subjects, such as *Crucifixion*, &c., being sold for about 1*s.* each; and, as they were not marked copyright, and, on inquiry at Stationers' Hall I found they were not registered, I thought there would be no harm for me to make lantern slides of them, and I copied five, as this would certainly not injure their sale, but, on the contrary, be likely to make them more popular. In February *last* year I was informed by a lawyer that I had done wrong in copying their pictures. I at once went over, and took all slides, negatives, and the scraps in my possession, and offered them twelve guineas. This they accepted as *penalties*. They would not accept the slides or negatives, and did not issue an injunction to prevent me from selling them, which, doubtless, they would have done had they, as stated in Court, sustained serious damage through the sale of lantern slides. They then issued process for *damages*, which, as doubtless you are aware, they succeeded in getting, 65*l.* and costs. The latter is, of course, what they wanted, and is by far the most serious part, as justice, or even injustice, is an expensive thing in "dear old England."

However, it is well it did not happen to a man with, say, a smaller business than my own. With me, it has spurred me on with greater energy and perseverance, and, doubtless, in the end will make little or no difference.

It appears in this country a picture need not be entered in Stationers' Hall if made in *Germany*, but an Englishman's picture must be copyrighted and registered in Germany as well as in his own country.

These are the same Haenfstangl of the Empire Living Pictures' celebrity, which case they lost. For a full report of my case, see *Times*, January 17. Thanking you, I am, yours, &c., WALTER TYLER.

48 *to* 50, *Waterloo-road, London, S.E., January* 19.

THE PROGRESS MEDAL.

To the EDITOR.

SIR,—In accepting—if he does accept—the Progress Medal of the Royal Photographic Society, does Dr. Emerson remember the following words from his last manifesto on the sole method of photographic art with which his name has been identified?

"And now list. I, saner than ever, renounce and abjure all theories, teachings, and views on art written, and first promulgated by me in sundry works, articles, &c., and finally collected in a volume entitled *Naturalistic Photography*. I cast them upon the dust heap."

The irony of the situation is complete. A certain amateur, "sincere, enthusiastic, but mistaken," as he afterwards acknowledges, writes a book, full of wild and whirling words which amuses the town for a time. He soon finds that his position is untenable, his teaching unsound, and, with the courage of an honest man, renounces his doctrine and withdraws his book. The Council of the Society decides that this is *progress*, and awards him a medal!

If Dr. Emerson has any sense of humour in him, he will see and enjoy the joke as much as does yours truly, A WONDERING PHOTOGRAPHER.

ALUMINIUM.

To the EDITOR.

SIR,—I read in last week's *Chronicle* an article on the above, in which it was stated that the present price of this metal was one shilling and sixpence per pound, as against twenty shillings a year or two since. The article further stated that aluminium could now be tooled and worked as easily as brass, and that, taking into consideration the relative weights of the two metals, one was as cheap as the other. If these statements are correct, how is it that manufacturers of lenses and cameras charge such high and prohibitive prices for their goods when mounted in aluminium? I notice, on referring to one list, that the difference in price in an eight-inch lens between brass and aluminium is forty shillings, and in a half-plate camera sixty shillings. I would commend these facts to the consideration of manufacturers, who, I think, would better serve themselves by revising their prices for aluminium-mounted goods.

While on this subject, might I add that those who practise photography, and want really first-class instruments, have to pay apparently very fancy prices for them. Is there any real necessity for a first-class half-plate camera of best make, with all movements, three slides, lens, and stand costing from 15*l.* to 25*l.*, or as much as a dining- or drawing-room suite of furniture?—I am, yours, &c., MARTIN D. KING.

5 *Clifton-gardens, Twickenham, January* 21, 1895.

DEVELOPING GELATINE PRINTS.

To the EDITOR.

SIR,—Mr. Wareing will find that Messrs. Lumière recommend an acid solution of pyro to develop their Citos paper.

I have tried it and find it much more energetic than hydroquinone for bringing out short exposure, and it does not stain except when the

development is much prolonged. I enclose specimen developed on Solio. It had an exposure of ten seconds at 4 p.m. The shadows were barely visible by daylight, but it came up readily with a solution of three grains pyro per ounce, slightly acidified with citric acid. I have also tried enlarging on Solio, but find I can get no useful result with three days' exposure, in fact, I fancy the image must be visible before development, no matter how faintly. Probably in direct sunlight enlargements could be made with ease. This I mean to try when the weather gets brighter, and will let you know the result.—I am, yours, &c., "OTHELLO."

January 21, 1895.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

COLONEL GUBBINS.—Mr. C. A. Rudowsky, 3, Guildhall-chambers, E.C., supplies such paper.

BACKING.—Caramel (burnt sugar) may be obtained of most drysalters and of all operative chemists.

T. E. HARRISON.—Photographically speaking, the prospects of success in Australia are considerably poorer than they are here, so that we hesitate in advising you to go there.

SUBSCRIBER FROM THE FIRST.—It is alleged that with a larger aperture better marginal definition is secured. It may, perhaps, be better to defer purchasing until the season is rather more advanced, by which time all the novelties will be before the world.

S. R. (Leeds).—Your query is fully answered in a leader in another column. If lantern slides are required from the engravings, permission must first be obtained. Better refer the matter to the one who wants to do the work, and let him get the necessary permission.

YORKS.—It does not follow that all patents sealed are really valid, because many would not be if they were contested in the Law Courts. However, if you have taken out a licence to work under a patent, you cannot, we believe, contest its validity, as you have already admitted that by taking the licence. As a matter of business, it is perhaps better now to help to sustain the patent rather than upset it.

B. E. W.—Ruled screens, by different makers, are supplied by Messrs. Mawson & Swan. The price varies according to size and the number of lines to the inch. Large sizes are proportionately dearer than small ones. This is due to the difficulty there is of ruling the large sizes to perfection. The smaller sizes, we believe, are frequently cut from larger failures, hence they are proportionately of lower price.

C. SPENCER complains that, in making a waxing solution for stripping carbon prints, developed on glass plates, according to the formula given in the ALMANAC, the whole of the wax does not dissolve, and asks if that is due to the wax being adulterated?—Not necessarily. Beeswax is not entirely soluble in benzole. If the solution be made according to the formula, it will answer, even though it be turbid.

H. C. GARRATT.—What you term "trick photography" does require special appliances, which would take up more space to describe than is available in this column. Various forms of it have frequently been described in back volumes and ALMANACS. Such firms as Marion & Co., Wilson & Co., and others publish a great variety of stereoscopic slides, but whether they have any that come under your idea of "comic" we cannot say.

PERICARP.—1. You are not entitled to pay for enlargements that are reversed, unless you specially ordered them to be so. The specimens enclosed are miserable. 2. If the single-view lens is really good, it should answer every purpose. We have heard the new lens well spoken of, but cannot speak from personal experience. When the weather gets a little brighter, obtain one on approval, and try it against the two you already possess.

A. J.—We are by no means surprised that you fail to get satisfactory enlargements by your system of working, namely, making the exposures by instalments and partially developing between them. Surely it is better to give the proper exposure and develop in the usual way, than to give a quarter of the exposure, then partially develop and again expose another quarter, and more development, and so on for the four exposures and developments.

T. C. B. (Leeds).—There is a very simple test by which a platinotype can be distinguished from a bromide print. It has only to be immersed in a solution of bichloride of mercury when, if it be a bromide print, the image will disappear, while a platinotype will be unaffected. Any one selling bromide pictures for platinotypes renders himself liable to penalties, it being a false trade description to issue one kind of print for the other, though we fear it is sometimes done.

HYPO.—No such book is published. The series of articles by Mr. Redmond Barrett in this JOURNAL for 1888 will afford you the necessary instruction.

TANAIS.—The contents of your letter are incredible, particularly as you decline to have it published, and rather hint that the address given is not where you reside. However, if your employers do not carry out their agreement to teach you the business according to the terms of your apprenticeship, the law will give you, or those who paid the 35*l.* premium on your behalf, full redress. The matter had better be placed in the hands of a solicitor—that is, if your statement be true.

R. WITHERS says: "A customer of mine has brought me a glass positive picture to restore and copy. It is in a case, and the picture looks all right, but it seems cracked all over, and in some parts peeled off the glass and left the image behind. Can you assist me at all?"—It is the black varnish that has perished. If, as is most likely the case, the image is on one side of the glass and the varnish on the other, the picture is easily restored by cleaning off the old varnish, either by scraping or dissolving it with benzole, and then revarnishing it. If, as is sometimes the case, the varnish was applied on the collodion, nothing can be done. A fresh coating of varnish will, however, often prevent the mischief from going further, or spoil what remains of the picture.

J. C. (Manchester) says: "I have been a printer over twenty years, and I have never been in a fix before now. I am using a sixty-grain silver bath and a good reliable paper; but, when the prints are put in water, they go quite flat and weak, and it is impossible to get a good tone. The governor says he gets the pure nitrate of silver at 1*s.* 9*d.* per ounce. Do you think that it can be pure at that price? I have laid the fault down to the water, as it comes through an iron meter."—If a gentleman of so long an experience in printing cannot account for the trouble, it is quite impossible for us to do so without knowing more than is contained in this communication. We may say, however, that the water meter has nothing to do with it, and that pure nitrate of silver is to be purchased at 1*s.* 9*d.* per ounce.

J. H. says: "A person came to my studio and sat for a large portrait. My canvassers used it 'for canvassing,' without my knowledge. She now refuses to pay for it, and has threatened to take action against me, unless I make a public apology. Can you inform me (and for the benefit of other photographers similarly situated) what I had better do in the case, or whether there is any lawful excuse for her not paying for it? In answering, please use my initials."—It has been decided that a photographer has no right to use a customer's portrait for his own purposes, and we are not at all surprised at the sitter's action. We should advise you to acquiesce gracefully in her requirements. It will be no excuse, in a Court of law, to say that the portrait was used without your knowledge. In law, a principal has to take the responsibility of the acts of his agents.

B. B. C. (Camborne) sends us the following letter, which we reproduce *verbatim*: "I bought a photographer's stock some time ago, and find chemicals that I have no use for unless I know what they are for in photography, and will thank you very much if you will kindly answer in your columns for Answers to Correspondents. 1. Mawson's negative collodion for iron development. 2. Iodiser for Mawson's collodion for iron development. 3. Potass sulphuret 4. Tinctura iodi. P.B. 5. Mawson's enamel collodion. I shall be glad to know how I may utilise them."—The chemicals may be utilised as follows:—1. In the wet-collodion process for taking negatives. 2. For iodising No. 1. 3. For precipitating silver from hyposulphite and other solutions containing it. 4. For adding a drop or two to the iodised collodion if required. 5. For enamelling paper prints. Any elementary manual of a dozen years or so ago will give every instruction in the use of all the materials.

S. & Co. (Shelton) write as follows: "We wish to use the collodion emulsion described by Mr. Banks in your issue of December 21 last, for a process in which it is necessary that the film should be loosened from its glass support and floated on to another support. We find, however, that Mr. Banks' formula gives a thin, brittle film, difficult to get away from the glass plate. Will you, therefore, kindly inform us what modification must be made in the constituents of the collodion, which, without materially altering its other properties, will give a film of a tougher and stronger nature?"—There should be no more difficulty in stripping these negatives than there is in stripping a wet-collodion one, provided the same method is used, namely, coating the collodion film with one of gelatine before it is removed from the glass. After the negative is finished and washed, either coat the collodion film with a thick solution of gelatine or squeegee a wet gelatine film upon it, and allow the whole to dry. Then, if the glass has been French-chalked or waxed before the collodion was applied, the film can be stripped off just as is done in the wet collodion process.

*** Several answers to correspondents unavoidably held over.

CONTENTS.

	Page
IMPORTANT DISCOVERY: A NEW LIGHT FOR PHOTOGRAPHERS	49
COPYRIGHT LAW IN PRACTICE	50
THE INTENSIFICATION OF GELATINE NEGATIVES OF LINE SUBJECTS	51
JOTTINGS. By COSMOS	52
THE HAND CAMERA: THEN AND NOW. By WALTER D. WELFORD	54
CHILDREN AT THE PHOTOGRAPHIC CLUB	55
SOME FORGOTTEN PAGES OF PHOTOGRAPHIC HISTORY. By W. H. HARRISON	55
THE SHREWSBURY CONVENTION	58
PHOTOGRAPHIC EXHIBITION AT THE BIRMINGHAM AND MIDLAND INSTITUTE	58
OUR EDITORIAL TABLE	58
NEWS AND NOTES	
MEETINGS OF SOCIETIES	60
RECENT PATENTS	62
CORRESPONDENCE	62
ANSWERS TO CORRESPONDENTS	64

THE BRITISH
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ARTIFICIAL LIGHT PORTRAITURE.

As, unfortunately, we are not yet in a position to speak concerning the practical application of the new light from acetylene, of which we wrote last week, and from which so much is expected, our theme will be the practical application of the common house gas to purposes of portraiture.

Many persons may be surprised to learn that it is possible to take a portrait at all by common gaslight, which is so vastly inferior in illuminating power to other artificial illuminants, such as the electric, the lime, or the magnesium lights; but it certainly can be done, and done with excellent effect—and this, too, without having to incur much expense, either for the gas or for the burners with which it is to be used.

A few years ago, when in Liverpool, we spent an hour in the stores of Mr. John J. Atkinson, and were shown by him a portrait studio lighted solely by the common gas from the mains. A brief account of it was written at the period. The sitter was lighted by a straight row of common gas burners stretched out before him at a distance from him of several feet, and at a height of about eight or nine feet from the floor. In this horizontal row there were in all six burners of the ordinary flat or fish-tail kind, and a strip of curved tin placed behind them served as a reflector. From one end of the horizontal top row of lights depended a similar gas pipe, pierced, like the former, with holes for the insertion of burners, and carried down in a slanting direction to near the floor. Here, then, was a top light and a side light, each consisting of six fish-tail burners. White screens, placed at the sides of the sitter's chair, and extending a little forward, served under skilled management to illumine the deep shadows and make the effect of the lighting such as might be obtained from a cloud lit by daylight, the principal lighting being by the gas flames direct. Good negatives, we were told, were obtained by an exposure of ten seconds.

We were a good deal struck by the simplicity of this system of lighting a sitter, and after reflection saw in what manner it could be rather more effectively applied to the every-day purpose of practical portrait photography, especially when, as at the present time, fogs and darkness so sadly interfere with the photographer's business.

From experiments made, we find that one gas burner may be made to do the work of four as employed under the conditions described. Domestic gas, at any rate all such samples of it as we have access to, as manufactured by the gas companies of the metropolis, is thin and poor, being lamentably deficient in richness or intensity; but, when it is enriched by being saturated to near the point of smoking by being passed through the vapour of naphthaline, then is its illuminating power increased to the extent, in some cases, of three to four hundred per cent. The power is thus afforded us of either reducing the number of burners to about one-third, and obtaining the same light as before, or of retaining the same number with the advantage of very greatly reducing the time of exposure.

Naphthaline is now being pretty generally sold throughout the country by ironmongers and dealers in lamps. The price we pay for it retail, in a London suburban dealer's shop, is a shilling for fourteen pounds, or twopence for a single pound weight. So far as we learn, it is employed exclusively for the enriching of gas, and is used in albo-carbon gas burners. It is a white crystalline body, sold, as a matter of convenience, in the form of round rods of the diameter of the average candle, and is broken up in pieces about an inch long. When used, enough heat must be applied to the receptacle containing the albo-carbon to liquefy it, when its vapour will be given off copiously. We find that a convenient way of using it, with little trouble, is to place a few ounces of it in a reservoir at the entrance end of an iron pipe in which the gas burners are screwed, with a small gas jet or spirit lamp below to liquefy it, a similar jet being placed below the iron pipe itself to prevent it from being condensed, and thus solidified on its way to the gas burners, in which condition it is of no avail.

Another and very important factor in increasing the power of the light, and thus of effecting a material reduction of the time of exposure, is in the employment of a properly constructed reflector for each light, instead of the strip of curved tin spoken of. The optical principle involved in a reflector is quite different from that in the case of either an optical lantern or a light-house lamp. What is required is a surface that will project forward in a large beam all the light that does not emanate from the burner in a line towards the sitter. The highest type of reflector would be a parabolic one; but, as this would prove expensive, it is well to be known that a very effective substitute may be provided by placing a concave glass reflector, silvered behind and protected by metal—a class sold by lamp dealers, in London, at a low price—and placing in front of it a short and rather wide cone of bright tin. This will prevent most of the side light from being wasted, for, with a cone of this nature projecting four or five inches in front of the flame, a great additional volume of light will be permitted to fall upon the sitter.

The class of portrait we have had in view when making experiments in this direction has been that of the head and bust; and for this we have been able, with six burners, to get a strong negative with an exposure certainly not exceeding that given in the best fitted-up electric light studios in the metropolis. But it is to be borne in mind that the direct rays from the electric lamp are never permitted to fall direct upon the sitter, but are radiated from an opaque white reflector.

In the foregoing we have assumed that the experimentalist or portrait photographer is quite able, by manipulating the lights and turning them around and about, to produce those effects desired in the proper lighting of the sitter, which is so highly important in successful portrait photography. The means here indicated can, in the hands of a man of taste and judgment, certainly be made to conduce to such end.

Quick-acting portrait lenses ought to be employed, and care taken that none of the direct light from the burners be permitted to fall on them.

DEVELOPMENT OF PARTIALLY PRINTED PROOFS.

Although, when the system of developing under or partially printed gelatino-chloride proofs was first introduced by Mr. W. J. Wilson, of the Paget Prize Plate Company, great things were predicted for it, and it was expected to inaugurate a new era in photographic printing, up to now comparatively little use has been made of the new power by the generality of photographers. Whether this is to be attributed to the proverbial "conservatism" of the photographic fraternity, or to a failure to produce results equal to those obtainable in the ordinary way, it is not for us to say; but we can assert with the utmost confidence that, if the latter reason be the real one, it is rather the fault of the operators themselves than of the process.

We have in the course of the past several weeks, when the light has been anything but favourable for rapid, or, indeed, for any printing, resorted to the development method with the most satisfactory results, both as regards the quantity of work done in a short period and excellence of the prints turned out, and we have little hesitation in saying that, after a few trials to master the details of the method, and a moderate amount of care, finished results equal in every way to those obtained by fully printing out can be secured with ease and certainty, and with a uniformity at least equalling that of the ordinary process. We may even go further and claim that, with some classes of negatives, notably those verging on excessive softness, the results obtained by development are distinctly superior to those produced from the same negatives in the old way. From this latter statement it may be inferred that development is less suitable for negatives of ordinary density; but, unless they be undeniably "hard," such is not the case, since, by arranging that the exposures are confined within suitable bounds, there is no difficulty, thanks to a certain amount of latitude in the development, in arriving at any desired result. With hard negatives by this method, as indeed by fully printing out, it is impossible to get the best results—at least, on gelatino-chloride papers, and such should be reserved, unless hopelessly bad, for use with albumenised or other printing papers.

In numerous instances that have come under our notice of failure in development with the ordinary commercial papers, the want of success has been laid upon the paper, an idea being prevalent that it is necessary for the emulsion to be specially prepared, or for the paper to be submitted to more than the ordinary precautions during the process of manufacture. In contradiction of this idea, we may state that we have never found a single sample of commercial paper, of several different makes, that was not amenable to development if suitably treated. Different brands of paper often require different treatment, and what suits one does not necessarily work equally well with others, though in a general way, if the paper is fairly fresh, very little variation in treatment is needful. Even with old paper that has become tinted at the back from incipient decomposition, it is not difficult to secure passable results by a modified treatment, consisting chiefly in using a more powerfully restrained developer; but naturally it cannot be expected under such conditions to obtain as perfect purity in the lights, or as rich tones, as with paper in a state of freshness.

With regard to the supposed necessity for extra precautions in the preparation of the paper to protect it from the action of light, so far as we are aware the ordinary commercial papers are invariably coated under such conditions as to preclude the possibility of any deterioration by light during the operation; in fact, the light employed is, as a rule, as safe as if the films were intended for development. Obviously, no other system would be admissible, since any carelessness in this respect might lead to untold trouble and loss. In point of fact, any paper that reaches the consumer's hands in an uncoloured state may be safely accepted as being free from any latent discolouration from the action of light during manufacture.

We were formerly of the opinion that exposure, as applied to gelatino-chloride paper, was incapable of producing an image that was not more or less visible to the naked eye, or, in other words, that the development was really only a process of intensification. That such is not actually the case the following experiment proves:—A piece of Solio paper was placed in a printing frame behind a cut-out mask of opaque paper and exposed for ten minutes at a distance of a foot from a duplex paraffin lamp. At the end of that time there was, as ought to be expected, not the slightest trace of a visible image. The paper was immersed directly into a developing solution that would have finished off a partially exposed print in from ten to fifteen minutes, according to the degree of exposure, but after the lapse of that period there were still no signs of an image, nor at the end of half an hour. The dish was left covered up and forgotten for another hour or two, when a strong image was found to have developed. This was not a mere "ghost," but a robust deposit, deep enough for the half-tones of an ordinary print; at the same time the portion of the paper covered by the paper mask had acquired a dirty slaty colour, the legitimately developed portion being a reddish brown, and quite distinct in colour. At what period from the commencement of development the image began to appear, and when the discolouration of the unexposed portion started, we are unable to say; but the result proves that the developer is fully capable of bringing out invisible details. Whether this power is of any great practical utility seems doubtful, except so far as may concern any detail that may have fallen just short of becoming visible during exposure.

The developer is, of course, the principal item towards success; the exposure, provided it be sufficient, is practically immaterial, though the best results are gained with the least trouble when the exposure is not cut too fine. The shorter the exposure, naturally the longer will be the development, and, as a consequence, the greater the risk of abnormal discolouration, especially if, from age, the paper should have a tendency in

that direction. An image that shows all the detail in the high lights, however faintly, is what we prefer, as we care not to trust to the power of the developer for any portion that is not visible. Such an image may be obtained from a negative of ordinary or moderate density by an exposure of from ten to twenty minutes in diffused light at the present time of year. We have before us, as we write, two prints which were exposed for a quarter of an hour each about three o'clock in the afternoon one day last week, and they are indistinguishable from others from the same negatives printed out in the ordinary way.

Such developers as tannic acid or neutral pyro, both of which have been put forward for the purpose, are of absolutely no use in a really practical way. It is true they will develop, and if the printing has been carried to nearly the proper strength, they may work the image up successfully; but any pushing, or forcing, or continuation of the action beyond a certain line, leads inevitably to degradation of the lights, if not worse.

The method just introduced by Mr. W. J. Wilson, of treating the print between exposure and development with a solution of bromide of potash, answers very well with some papers, and especially when a rather full exposure is given. But it is apt to be uncertain in its action, unless the paper is in perfect condition and nearly newly made. For reliability and uniformity of work we greatly prefer to substitute, for the preliminary treatment with bromide, a developer which itself contains a very large percentage of bromide. This, though perhaps rather slower in action, is far more regular and reliable, and is absolutely free from any tendency to degradation of the whites, which often occurs with the other. The formula issued by the Eastman Company for use with their Solio paper may be taken as the type of developer referred to, containing six grains of bromide to each grain of reducing agent; in this case, hydroquinone with caustic soda as the alkali.

But though this solution answers well with a full exposure and when newly mixed, there are objections to its use which we will name. In the first place, while hydroquinone gives a vigorous image of good colour, it is liable, and especially in the presence of caustic soda, to cause a deep yellow stain, if, from shortness of exposure, the development is protracted beyond a certain point; in fact, a quarter of an hour or twenty minutes will often suffice to start this staining action. Again, for what reason we cannot say, bromide of potassium and bromide of ammonium are both used in the formula, the latter salt being decomposed by the soda with formation of bromide of sodium and free ammonia. This matters comparatively little at first; but if a number of prints have to be developed in the same solution, the volatility of the ammonia leads to considerable uncertainty. Lastly, the caustic alkali, unless the development is carefully watched, tends to slightly veil the whites in the latter stages of development, and is, even in this formula, better replaced by carbonate. With this modification, and the substitution of bromide of potassium for the ammonium salt, the developer works very well.

For our own purposes, however, we prefer to use either metol, glycin, or amidol, the latter with a much-reduced proportion of alkali; for the latter we prefer to employ carbonate of potash, the following being the exact formula per ounce of solution:—

Metol or glycin	3 grains.
Sulphite of soda	24 „
Bromide of potassium	30 grains.
Carbonate of potash	3 to 6 „
Water	1 ounce.

Plunge the prints directly into this on coming from the frame—the first action will be to make the image almost disappear—and continue development until the image is considerably stronger than required in the finished print.

The Presidency of the Convention.—We understand that Mr. A. Haddon has been nominated to the presidency of the Photographic Convention of the United Kingdom. Mr. Haddon, as most of our readers know, is an accomplished photographer and investigator, to whom the photographic world is very much indebted for the results of a great deal of experimental work. Moreover, his personal qualities are such as well fit him for the post he is to occupy; and we have little doubt that, under his sway, the Shrewsbury Convention will not fall behind any of its predecessors in point of interest or success.

The Free Portrait Scheme.—During the past week quite a number of letters have reached us from different parts of the country anent the Tanquerey concern in Paris. This concern, it seems, is far more liberal than the old Beresford affair or the one at Ealing. The latter only promised a picture worth a couple of guineas, while the former offer one of the value of five pounds, free of charge. There is strong competition in the trade! We suppose that, so long as there are persons simple enough to expect that they can get something for nothing, so long will these concerns flourish. Photographers could, however, help to put down this traffic if they would collect the reports that have appeared in the photographic journals and in some of the daily papers, and display them in some conspicuous place in their establishments. Last week "Cosmos" asked what the N.A.P.P. were about. If it were to compile what has appeared from time to time in connexion with the free portrait trade in the form of a sheet for photographers to display, it could then claim to have done—at least something.

Splitting Films.—At a recent meeting of one of the London Societies, several complaints were made of the gelatino-bromide film splitting, or peeling off the celluloid support after the negative was finished and dried, and, in some instances, before exposure. There is really very little bond of union between gelatine and celluloid, particularly when the latter is not thoroughly seasoned and still contains some of the solvents, and we know of one very ingenious form of hand camera being abandoned by its makers from this cause alone. In changing, the films had to be considerably bent, with the frequent results that the gelatine left the celluloid. If, when the negative is finished, the bromide film left its support entirely, not much inconvenience need arise; but the unfortunate part of the matter is that it does not do so, but adheres in parts, and cannot from them be detached. Hence the negative is sometimes lost. Cannot this be avoided? Some two years or more ago some films of the rollable type, of Continental make, were placed in our hands for examination. We found with them that the emulsion was not applied direct on to the celluloid, as there was an intervening layer of insoluble gelatine, which we have reason to believe also contained a silicate. When the films were treated with warm water, the emulsion could be dissolved away, but the insoluble gelatine remained, and that could only be removed with long soaking in very hot water, and then scraping it off. If the keeping qualities of the gelatine film are impaired by contact with the celluloid, this insulating layer ought to improve them, while at the same time preventing peeling or splitting of the sensitive film.

Mysterious Spots.—Scarcely a week passes that we do not receive one or more letters, the majority of them from professional photographers, seeking advice in the matter of spots on prints which they cannot account for. There is more than one kind of spot, and

more than one prolific source of them. The fact that more complaints of the trouble are received during the winter months than at any other time led us, some year or two ago, to suspect that some of them were due to local conditions that did not obtain at other times of the year. An investigation in an establishment where the trouble was often met with led to the discovery of quite an unsuspected source of it. In that establishment it was the custom to take the prints out of the washing tank the first thing in the morning, and at that time the studio adjoining was being swept up and dusted for the day. Now, the studio was heated by a coke stove, and it was customary to blot off the prints and then lay them out on paper near the stove to dry. It occurred to us that the dust from the coke ash might be the source of the mischief, and that proved correct. Some prints were taken and blotted off, and then cut in halves. Several of the halves were laid near the stove to dry, and the fire raked to create a dust. The other halves were dried in another room. Then the two halves of each print were mounted side by side on the same card, and in each case, after a few days, those halves dried near the stove showed a prolific crop of spots, while the others were free. There are, of course, numerous other causes of spots, but floating particles of pernicious matter are often an unexpected source of them.

Finders.—During the discussion following on Mr. Welford's paper on the *Hand Camera*, at a recent meeting of the London and Provincial Photographic Association, one of the principal points considered was finders. Some of the speakers seemed to be of the opinion that these adjuncts were unnecessary, while others considered they were essential. Now, he would be a bold man who would nowadays put a hand camera upon the market unless it were furnished with one or more finders. Yet we know some excellent workers who never think of looking at this part of the apparatus. The majority of finders, as fitted to hand cameras, are faulty as well as inconvenient. One of the speakers at the meeting referred to is reported to have complained that most finders were faulty as regards curvature of image, and had not the same focus as the lens. Now, these can scarcely be considered as faults in this instrument. Supposing the marginal lines do show a curvature, what matters it? The lens will take them perfectly straight in the negative, and, if the finder were of the same focus as the lens, of course the apparatus would be increased to nearly double the dimensions. The chief faults with the majority of finders—and they are easily remediable—is that they are misleading, for few of them show the same angle of view as that given by the lens, and, moreover, they are often fixed so that they do not show the position of the image as it is produced in the negative—they are not properly adjusted. That can easily be proved by placing the camera at a window and arranging it so that some conspicuous object falls on the centre of the finder, and then noting, if the camera be a focussing one, if it coincides with the centre of the ground glass; or, if the camera is not furnished with a focussing screen, by simply taking a negative. One wants in a finder to see the image, in miniature or otherwise, exactly as it will appear in the negative—and that is what a large proportion of them do not show.

THE AMOUNT OF SILVER IN SOLARISED ALBUMEN PAPER.

The amount of silver that goes to form the image in a print on albumenised paper seems, judging from what has been written on the subject lately, to be of considerable interest to photographers, and, in view of the various estimates that have been given, we have thought it worth while to investigate the point.

Mr. Starnes, relying on a statement made by Professor Hardwich, states that the mount of metallic silver in a sheet of solarised albumen paper, fixed and washed, amounted to less than half a grain; and, on referring to *Photographic Chemistry* (fourth edition), by Hardwich, we find, on page 23, the following statement: "In the darkening of photographic papers, the action of the light is quite superficial, and, though the black colour may be intense, yet *the amount of reduced silver which forms it is so small that it cannot be conveniently estimated by chemical reagents.* This is well shown by the results of an analysis performed by the author, in which the total weight of silver obtained from a blackened sheet measuring nearly 24 × 18 inches amounted to *less than half a grain.*"

The statement that the silver in a sheet of solarised albumen paper only amounted to something less than half a grain we have always looked upon with suspicion, in view of the fact that, in our research on the fixing and washing of prints, we found that, after removing all the silver we could, there still remained a quarter of a grain per sheet of metallic silver in the form of a compound not attacked by hyposulphite of soda; this would reduce the amount of silver forming the image to *one quarter of a grain*, and, even allowing that it consists to a large extent of organic colouring matter, this seems far too low.

On the other hand, Mr. Dunmore quotes some experiments made by the late Mr. Bedford, in which the amount of silver in an ordinary (*i.e.*, not solarised) print, 22 × 17½, is given as seven grains. This result, however, is of little value for the purpose of estimating the amount of silver in a print, as it was carried out indirectly, by starting with a definite amount of silver in the sensitising bath and recovering and weighing all the silver residues. This, though valuable as a check and as an indication of the loss in practical working, is too open to error to be of any use in estimating the silver in a print.

The relation between the amount of silver in the original sensitised paper and the amount of silver in the finished print we considered might be of some interest, and we have therefore estimated the amount in the original paper, the amount when it had been washed but not printed on, and the amount in a sheet of paper which had been solarised, fixed, and washed. The paper used was single albumenised (crossed swords), and sensitised for three minutes on a fifty-grain solution of nitrate of silver to the ounce of water, neutral. It was then dried, and a portion of it burnt in a porcelain dish until all carbonaceous matter had disappeared. This, when cold, was washed several times with distilled water in order to remove all soluble salts, and then treated with hot dilute nitric acid in order to dissolve the silver. The solution was then filtered off, and the residue again treated with nitric acid and washed several times with water. The silver was then precipitated by the addition of hydrochloric acid; the precipitate, being separated by filtration, was washed and weighed in the usual manner.

Another piece of the paper was washed until all free silver was removed, and then dried, burnt, and treated as before. The third piece was pinned on a board and exposed to diffused light beneath a glass roof for ten days, till the paper was solarised as far as possible. It was thought necessary to expose it during this length of time in consequence of the weakness of the light at this time of the year. The paper was then washed, fixed, and again washed to remove hypo and soluble salts of silver; it was then dried, and the silver estimated as already described

	Per sheet.
Silver in albumen paper, unwashed	18·36 grains.
Silver in albumen paper, washed but not printed or fixed.....	4·32 „
Silver in albumen paper, solarised, fixed and washed	3·08 „

This result, 3·08 grains per sheet of solarised paper, is very largely in excess of the amount found by Professor Hardwich, being, in fact, about what one would expect; and we are unable to account for the discrepancy between his figures and ours, unless possibly the paper he used was sensitised on a bath widely different from ours, or possibly the statement that the paper was solarised is an error.

The actual amount of silver forming the "image" on the paper after deducting the quarter of a grain is 3·08 − 0·25 = 2·83 grains, and this amount spread over a sheet of paper 22 × 17½ inches is sufficient to give it a deep red colour by transmitted light, and a dark chocolate by reflected light. It would almost seem from this that a portion at least of the colour of a print is due to organic matter held by the silver, acting as a mordant or in combination with it.

The relation between the amount of silver originally in the paper and that in the solarised is of great interest. The original amount

of silver is 18·36 grains, and, after fixing and washing, this is reduced to 2·83 grains—that is, only 15·4 per cent. of the silver originally present has been used in forming the "image;" yet in practical work it seems necessary to have this large excess of silver, viz., 84·6 per cent., to produce a satisfactory result; and, even granting that it requires 20 per cent. of this silver (84·6 per cent.) to absorb the chlorine set free, it still leaves an excess of 60 per cent. It is possible that the formation of the organic colouring matter is a function of this excess of silver; but the whole subject, though one of great interest and importance, seems to have had very little attention paid to it.

The 2·83 grains forming the image, in the case of a solarised print, of course largely exceeds the amount of silver present in an ordinary print with high lights, half-tones, and shadows. This, and the amount of gold taken up during the toning, we hope to investigate on some future occasion.

A. Haddon.
F. B. Grundy.

ALIEN SKIES.

An Apology, A Commendation, and some Hints.

[Croydon Camera Club.]

In saying a few words introductory to the demonstrations of how to add skies to prints or slides, which your members, Messrs. Packham and Holland, will bring before you this evening, in the first place, let me impress upon all here that blank paper or clear glass, in lieu of atmosphere, is an abomination. Those who are disposed to continue this malpractice please remember that, inverting the adage, their case will certainly prove to be all blanks and no prizes; and quite right too, for whiteness, instead of the unending delights of cloudland, is false to nature and *odious* to art.

Those I am addressing are, I full well know—and it is greatly to their credit—vastly enamoured with what is called *pure* photography; I mean the photographic positive which is printed from the whole negative, and nothing but the negative. Those of you who are seeking to perfect photographic procedure, so that the product of plate, lens, and camera shall become unimpassioned actualities, instead of, as at present, imperfect mimicries of natural objects, will do well to sternly reject any inducement, however seductive, to tamper with your negatives; indeed, we may *all of us*, on occasion, strive to turn out work which has received no assistance, by addition or subtraction, of a purely arbitrary character.

But, after all, we are, or should be, Photography's masters, and not her servants; and, if we wish to use her to help us make decorative scenes, we should not hesitate to order her as we think desirable. The worship of truth should not debar us from enjoying some recreative fiction, any more than those of us who revere the Bible are thereby rendered incapable of appreciating *Hamlet*.

Many otherwise clever photographers, while admitting that added skies are greatly to be desired, shrink from the difficulties involved, and are beaten without a struggle; hence, no doubt, why so many relatively poor—I may say wretchedly bad—photographs abound. The photographic *pons asinorum* is such a ridiculously easy one to traverse, and the toll is so low that the crowd of camerists which rush across, to pick up pictures wherever they go, imagine that there is nothing more to do than work hard in the fashion of one who plays a piano-organ. The resulting flood of callow prints is, or should be, a distinctly precious indication to those who care to learn that not merely determination and industry are needed, but also manipulative skill and artistic taste of high efficiency if photographic pictures of the best quality are to be produced.

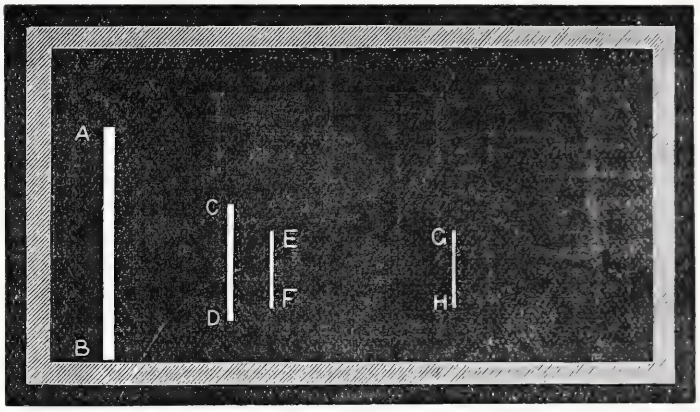
Before passing on to matters of printing, I had some intention of making a few remarks upon cloud-*taking*, but refrain on account of want of time, except to briefly note that what are called natural skies, *i.e.*, skies which are obtained at the same place and time as the terrestrial portion of the picture, are usually procurable by the following means:—(1) Masking during printing; (2) employing screen and isochromatic plate; (3) local development of foreground in negative and sky in positive; (4) double exposure and printing; (5) employing a sky shade; (6) employing a polariser.

Before glancing at some methods of printing in skies, I should like to interpolate two or three remarks on the general question, Which are, as a rule, preferable, natural skies or alien ones? There is, of course, much to be said upon both sides. For myself, apart from any considerations of the claims of pure photography, I am disposed to approve the use of a sky which has been specially selected by the photographer as the most effective background to his picture.

In deciding such a point for yourselves, you must remember that nature is by no means synonymous with art. If you lived by the pencil, you would know that it is often only by much coaxing the artist can persuade Miss Matter-of-Fact to put on the beautiful fancy dress he has fashioned. Admitting as, I think, you will readily do that mere natural facts are, or may be, most antagonistic to the poetic and forcible to the refined rendering of scenery, it becomes at once self-apparent that the power of deliberately choosing and arranging a sky so as to fortify our foreground is exceedingly valuable. This power is almost unavailable to him who takes the alternative and patiently waits until the clouds drift by which are unsuitable, and those which are wanting come into position.

There is, by the way, another advantage than already indicated, which follows the employment of alien skies, that is, the power one thereby has of suggesting distance by employing a lens to take skies which is of slightly longer focus (smaller angle) than the lens used for the landscape. By this expedient a much stronger impression of recedence and atmosphere is possible. This is due to optical laws, whereby known facts exert an unconscious influence in the production of mistaken impressions. Let me shortly explain what I mean. In all monochromatic pictures, other than stereoscopic ones, distance is chiefly conveyed to the beholder's eye by two methods, one being the irregular lessening of contrast until what was all detail becomes all mist, the other is by the orderly diminishment in size of objects.

Where the amount of brightness is constant, and no ocular means of measuring comparative dimensions of objects exist, it is quite impossible to guage distance. Of this the well-known line, "Thou art so near and yet so far," applied to the stars, gives popular recognition; in point of fact, mere star-gazing affords us not the slightest hint as to which particular luminary is nearest to us. To bring home to you how largely this matter of size indicates distance, let me direct your attention to the following diagram. A B is some object



of definite known height—say, a man measuring six feet—standing on the plane of the picture. It can be proved that, if the beholder stands at a given distance, another man of the same height, twenty-four feet further away from the beholder, will appear to the eye of the dimension C D, while one thirty-six feet behind H B would not be higher than E F or G H.

Knowing the foregoing and kindred facts from cumulative experiences, wherever the eye sees any object, the real dimension of which it is aware, it intuitively gauges, with tolerable accuracy, the distance of the object in question. In the accompanying diagram, E F is about one-third the length of A B, reduce it to one-quarter, and it will appear very much further away.

So with clouds: although there is not that nice appreciation of size present when we look on clouds which enables us to readily resolve upon the relative amount of recedences of various clouds, simply by noting the angles they subtend, it is none the less true that all accurate observers of cloudland, be they meteorologists pure and simple, or painters, or intelligent landscape photographers, or lovers of art or of nature, all are able, with considerable approximate accuracy, to resolve the distance of a cloud by its size; for all these know that different classes and kinds of clouds; under various diurnal or physical influences, not merely put on definate shapes, but attain a certain average of size.

From the above considerations, it necessarily follows that, if the clouds printed into a landscape be *somewhat* smaller than nature would make them, the resulting effect will be that, in the first place, the idea of distance or recedence will become considerably augmented and, in the second place, a suggestion of spaciousness or largeness will be lent to the chief objects in a composition which will very

much accentuate the importance of the pictorial features in the foreground.

I need surely not dwell upon the need of much discretion, or tact, in employing the above expedient; for, as in all matters of fiction, anachronism is at once noticeable, and is, with justice, resented.

With some apology to him who, following me, is about to enlighten you upon the application of alien skies to lantern slides, permit me, before concluding, to lightly sketch certain methods, which are available to you, in doing which I have endeavoured not to trench upon what Mr. Holland has in store.

You are, of course, aware that the procedures at your disposal are broadly divisible into those which are applicable, on the one hand, to contact printing; on the other, to reduction. And, no doubt, you are further aware that many hold that, where a slide is made by reduction, the printing-in of alien skies becomes much easier. How easy the procedure is you were not long since shown by our former Vice-President, Mr. B. Gay Wilkinson; I think, however, that he and others have somewhat over-exagerated the difficulties which attend the printing-in of skies by contact. Of this you will be somewhat better able to judge when Mr. Holland has shown you how *he* overcomes the difficulty. Meanwhile, let me briefly introduce to your notice certain alternative ways.

For one of the following I am indebted to a communication by Mr. S. H. Fry; the other is, as far as I know to the contrary, part and parcel of that general knowledge which has grown up no man can say where or how. One of the expedients referred to is simply to print the whole of the sky negative upon a plate which is used instead of an ordinary cover glass, paying no regard whatever to the landscape except to pick out the precise portion of the sky negative which will best accord with the scene.

After development, fixing, very *thoroughly* washing, and drying, the sky and landscape plates are placed back to back, and a solution of Farmer's reducer carefully painted over that portion of the sky positive which would otherwise obstruct the landscape. If this be properly done, wherever the reducer has been sufficiently applied, there should be the equivalent of clear glass. The addition of ammonia to the above is an advantage. Thus, to one ounce hypo (1 to 20) add one minim ammonia; to this add sufficient ferricyanide of potassium to make the colour of the mixture dark amber. In some instances it has been found that neither of the above leave the portions to which they are applied perfectly transparent, hence a more energetic mixture has been advocated, viz.,

Cyanide of potassium	100 grains.
Iodide of potassium (tincture)	25 minims.
Water	1 ounce.

In using the last formula, remember that the cyanide is a dangerous and virulent poison, and beware of getting any of the solution into cuts or scratches.

The other method is one which will, no doubt, commend itself to some of you on account of its comparative novelty, and also that you can, by following the directions I shall give you, obtain cloud and landscape upon one plate.

Assuming that your negative is one in which the clouds do not print through, and that about its horizon there are no intrusive white objects, proceed to expose and develop in the usual manner; next give the plate a complete but rapid wash; while the plate is still wet, take a piece of celluloid, such as I have in my hand, place it on the film side of the slide, and carefully rub it into contact; next completely dry the surface of the celluloid. Having ready your cloud negative, which should, when used as described, be protected from injury by water with varnish, place it over the celluloid and expose to light. During exposure you may shield the landscape from further light action, or not, as you please, your decision depending upon the after-treatment you decide on adopting. If shielding has been resorted to all that is needful is to replace the plate in the developing dish—the celluloid being previously detached—otherwise the slide is tilted at a convenient angle, sky portion being lowest, and the developer painted on to the cloud part until the desired result is attained. Inasmuch as the whole of the terrestrial portion of the picture is already full out, it is comparatively easy to work from the horizon downwards, without doing the slightest damage to the lights or shadows of the landscape; in some cases advantage can be taken to very much fortify and improve objects abutting upon the sky which are partially halated or—as in distant hills—are hopelessly over-dense in the negative if printed and developed in normal fashion.

I will no longer, gentlemen, stand between you and Messrs. Packham and Holland, but will conclude by reiterating that the way to perfection in landscape photography lies through that

"Great opaque blue breadth,"

wherein are poised the towering cumulus, the soft nimbus, and the exquisite cirrus; and where haze and mist play such fantastic tricks with light and shadow, that the prosaic clay with which our landscape is built up becomes ennobled by a glorious diadem, richly dight with fancy, poetry, and with splendour.

HECTOR MACLEAN.

THE INFLUENCE OF ORTHOCHROMATIC PLATES AND YELLOW SCREENS ON COLOUR VALUES.

[Croydon Microscopical and Natural History Club.]

THE subject we propose to bring to your notice this evening is full of interest, but presents several technical difficulties. It must not be supposed that we are about to introduce to you "Photography in natural colours," because, in our humble opinion, this much-desired consummation lies in the dim and distant future, because it seems to be overlooked by many who talk glibly on this subject that, to obtain a photograph in natural colours, it is not only necessary to obtain a sensitive surface which shall be capable of being impressed by not only every possible colour, but by every possible shade of every possible colour, and not only so, but that the *colours themselves*, and not merely their colour value, shall be produced on the plate. And then, if even we should obtain such a negative, how about its multiplication as prints? Our task to-night is much less ambitious than this. All of you, of course, know that a negative is a representation in black and white of some object seen with the eye, and the careful photographer seeks, by varying exposures, by modifications in development, and by other means, to obtain what is called "gradation," or a softening off, and merging as it were the lights and shadows. Now, the object of "orthochromatic plates" and "yellow screens" is to still further enhance this effect, and enable us to obtain a truer rendering of the endless variety of colour observed in nature. The colour-sensitive plates of Mr. Edwards, and those by the Ilford Company, are no doubt well known to many of you, but there has recently come under the notice of the photographer another plate, or rather a series of plates, by MM. Lumière, of Paris, which must be recognised as a distinct advance upon anything previously done. We have here some negatives and prints taken from them (shown) of coloured subjects, one of them being the colour chart issued by Messrs. Cassell, which will enable you to see clearly the effects produced. We show you negatives on ordinary plates, on Ilford isochromatic plates, and on the ortho and panchromatic plates of MM. Lumière, taken some with and some without the yellow screen, and you will observe that, while the ordinary plates are sensitive enough to the violet end of the spectrum, they fail to render the orange and red end. Isochromatic plates, however, especially in conjunction with a yellow screen, give a much truer colour value to the yellow and red end of the spectrum, while with the plates of MM. Lumière we have A sensitive to yellow, B sensitive to yellow and red, and C sensitive to yellow, red, and green, this effect being enhanced by the use of a screen. This screen may be formed either of gelatine or collodion films, or of optically worked glass (shown), and its colour may vary according to the results we wish to obtain. For our own part we prefer a screen like a miniature alum trough or animalculæ cage, used with the lantern (shown), and which consists simply of two optically worked and colourless squares of glass (ours are two inches square), kept apart on three sides by strips of glass, the whole being cemented with balsam in chloroform. On the top is another little *loose* bar of glass, to prevent the spilling of the liquid, and to keep out dust, &c. Into this little trough, which is readily adapted to the inside of the camera, behind the lens, any coloured liquid of any depth of colour, perfectly clear and free from floating particles, may be put, capable of being rapidly changed at will, and dispensing with the difficulty, if not impossibility, and likewise the expense of having to provide a number of pieces of optically worked glass of a variety of colours. It will doubtless be asked, How are we to develop plates so ultra-sensitive as this? We will show you. We have here a Lumière C, which, as we have stated, is sensitive to yellow, red, and green. This plate has been exposed on the chart for five minutes, using a medium yellow screen. It was taken from its box and placed in the dark slide in perfect darkness, the sense of touch only being invoked; development *may be started* in the same way, having everything quite ready to hand in advance; after a short time the progress of development may be watched at intervals by means of a pale green light (shown), keeping the dish covered in

the intervals. In this way, and by using amidol (as we have done), a nice clear negative, free from all fog, may readily be obtained. By the kindness of Messrs. Fuerst Bros., we are able to show you the results of the Lumière competition, just decided, in the form of two 15 × 12 prints, the negatives of which were on their C plate. The chromo-lithograph had an exposure of two hours by *lamp light* at *f*-16, a rather dark orange screen being used. The colour chart had an exposure of one and a half hours under similar circumstances. You will have no difficulty, on comparing the three results—*i.e.*, (1) an ordinary plate, under ordinary conditions and no screen; (2) a Lumière C plate, under ordinary conditions, with a screen; (3) a Lumière C plate, under special conditions, and with a screen. Under these last conditions the maximum orthochromatic effect seems to have been attained; the colours at the violet end of the spectrum have been subdued, giving those at the red end time to act on the plate. These pictures gained the *first prize;* but in the case of the *third prize*, a different mode of procedure was adopted. The window of the room in which the exposure was made was papered over with orange paper, the subject therefore being illuminated only with monochromatic light, as suggested by Mr. Leon Warnerke, in the *Journal of the Royal Photographic Society* for November 29, 1894, the exposure in this case, on Ilford isochromatic plates, being no less than nine hours. It is obvious, however, that while we are able to obtain such results under special conditions, these methods can only be adopted in the studio for copying, &c.; for ordinary outdoor work, we must at present be content with something less, as we cannot illuminate a landscape either by lamp light or with monochromatic light, and exposures lasting for hours would be difficult, if not impossible, by reason of wind, &c.

There is another point to which we might direct your attention, viz., the groundwork upon which the colour is superposed. We have prepared two diagrams, exactly similar as regards the colours used and the size of the discs of colour (four inches across), but in one case the ground work is *white*, in the other *black*. We have made four exposures on these with Lumière C plates, two *with* and two *without* a dark orange screen. The exposures were out of doors, and were for one minute at *f*-32 without the screen, and for ten minutes at *f*-16 with the screen. On comparing these, you will see that truer colour values were obtained with the black ground than with the white ground; the colours used were ordinary water colours, emerald green, crimson lake, Indian yellow, cobalt blue, and Prussian blue, laid on with a brush. The blue and yellow impressed the plate less with the black ground than with the white, and when the screen was used, the effect was still more marked.

It is quite manifest, from the few and imperfect preliminary remarks we have had the pleasure of laying before you, that a wide field, very full of interest, is open to any one who likes to pursue this very attractive subject, and it was in the hope that we should be able to awaken such an interest that we consented to bring the subject under your notice to-night. J. H. Baldock, F.C.S.

THE PHOTOGRAPHIC NATURALIST.*

I.—Floral Photography.

Agricultural Photography. — Professor Girard has adopted the photographic method, at the Paris Conservatoire, for showing the development of roots and leaves under the influence of fertilising manures. The value of such faithful records of the results of experimental agricultural processes can scarcely be over-estimated. Valuable assistance has also been rendered by photography in illustrating the diseases of plants. Professor Bary, of Strasbourg, has published photographs of the potato blight (*Peronospora infestans*), which show perfectly even such minute detail as the conidea, or reproductive cells.

In the United States, fruit-growers have made extensive use of photographs of fruit-laden trees, to circulate amongst the dealers who tender for the purchase of the fruit.

Photographs which show the prominent characters of the natural vegetation of the soil afford useful information concerning the fertility or wetness of the land. The connexion between certain wild flowers and barren soils has long been utilised in agricultural reports. Floral photographs, properly selected, should invariably be consulted by emigrants, settlers, and would-be farmers, in cases where a personal visit is not possible. Even the trees give an ndex to the nature of the soil in which they grow. The poplar, willow, and alder indicate wet, boggy land; the pine and larch a thin, dry, rocky soil; and the oak, elm, and walnut show deep, rich loams and fertility.

* Concluded from page 42.

Nature Printing and Floral Structures.—One of the oldest phases of photographic art is the reproduction, by contact printing, of leaves and flowers. This process has the double merit of preserving details which are lost in the dried specimen, as well as of enabling photographic impressions to be made of objects which are too small to reproduce by means of the camera. More than thirty years ago, Mrs. Atkins, daughter of a keeper of the zoological department of the British Museum, prepared a series of beautiful cyanotype impressions of algæ and fucoids. One volume of these nature-prints is still in the British Museum, another is at Kew, and possibly others are in existence. Cyanotype is peculiarly suitable for this purpose, both from its permanence and the ease with which the paper can be prepared; but any photographic paper will serve. Remarkably pretty effects can be obtained by printing on albumenised paper and soaking in aniline dye of suitable colour. The dye does not show on the black background, and the impressions shine out like paintings on ebony. To secure the best results, the specimens should be used fresh. They should be pressed between blotting-paper, to remove any excess of moisture which might stain the paper. They may then be fastened, with dilute gum water, to a sheet of glass, which can be afterwards used as an ordinary negative. If the specimens are allowed to get too dry, the ribs and veins become opaque, and are shown in the print only as ill-defined white lines; but, if fresh, they are sufficiently translucent to print in clear dark lines. Dried leaves, however, can be rendered translucent by prolonged soaking in water, and, if a little glycerine is added, they retain their translucency for some time. Leaves which are too dark to print well can be bleached with a solution of sodium hypochlorite, and those which are too transparent can be stained with turmeric. Besides their use as botanical studies, such floral impressions afford excellent designs for decorative work.

Flowers and Foliage in Landscape Photography.—Wind is the worst enemy of the photographic botanist. Outdoor work is nearly impossible unless there are at least calm intervals of sufficient length to secure proper exposure of the foliage in the foreground. This difficulty is intensified by the prolonged exposures required when using colour screens. But even on windy days there are often convenient lulls when a good photograph can be secured. Even on calm days there is nearly always a movement of the foliage with every change from sunshine to shadow and *vice versâ*. These small air movements are quite enough enough to spoil the definition of delicately balanced leaves and flowers. To cap the lens and expose in detached intervals is perhaps the only remedy under such circumstances. The stillest atmosphere is that which accompanies an anticyclone, or that which often precedes a thunderstorm. The early morning of an autumn day in England is often accompanied by calm airs which would not make an aspen quiver. The same quiet atmosphere usually prevails during a fine, soft rain, which in itself is no obstacle to clearness and definition of near objects. Dull days are more valuable in floral photography than bright sunshine, which is apt to give hard pictures, with strong contrasts and no detail in the shadows.

To the landscape photographer a little botanical knowledge is of the first importance. To choose that season of the year when a landscape will make the most pleasing picture will be to consider the effect of the presence or absence of foliage. A stretch of water, monotonous at one time of the year becomes picturesque when overgrown with rushes and water lilies, or overshadowed with the pointed leaves of graceful willow branches. The soft white clusters of clematis relieve the autumnal hues of many a mass of vegetation which at any other season would be sadly wanting in contrast. How different does a hedgerow look in early summer, with its unbroken mass of yellowish green to its appearance later in the year, when its autumnal tints are broken with wreaths of yellow-leaved convolvulus and graceful fronds of bracken. In selecting a suitable foreground for a landscape, there is nearly always a choice of several kinds of foliage, and the expert photographer will not be long in selecting that which will best harmonise with the contemplated picture. Even then he may decide to delay the photograph till some later period of the year, when those yellow heads of hawkweed will be a mass of silver stars, and the dark green foreground will be spangled with delicate tufts of thistledown. In these days of colour-correct photography all these points must be taken into consideration by the artist who wishes to make the best of his picture.

One great difficulty in the photography of foliage and wild flowers is the confusion of mass. It is just those localities where luxuriance of growth indicates suitable conditions of soil and climate, and where individual species attain proportions of more than ordinary magnificence that the field naturalist wishes to record by means of photography. Yet this very profusion is often a source of indistinctness

in the photographic camera. To obviate this objection, the immediate foreground should be so manipulated that only a few of the most prominent specimens stand up bold and clear amidst their surroundings. The excessive concentration of small detail effected by the photographic lens will otherwise tend to confusion amongst the smaller specimens of our native flora. In England we have but few large-leaved plants: we have no such noble species as the Catalpa, with its flower clusters a foot in length, or the Paulownia with its leaves fifteen inches in diameter; but, insignificant as our flora may be in comparison with that of other countries, it is none the less interesting to all true lovers of British landscape.

J. Vincent Elsden.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

II.

When dealing with outside subjects in a previous article, I referred to the necessity of bright sunshine for landscape work, and the importance of studying well beforehand the best time of day for exposing on such subjects.

In striking contrast (so far as the employment of the most suitable kind of light is concerned) to landscape work is that of taking groups in outside situations, for bright sunshine is just about the most troublesome light that an operator can have the misfortune to contend with, for every one must be familiar with the heavy cast shadows, so objectionable when sunlight was used. The best light for groups is, undoubtedly, when the sun is just seen glimmering through white fleecy clouds, but not sufficiently strong to throw heavy or decided shadows from hats, caps, &c., or to cause discomfort by glare to the eyes of the sitters. It is when an operator has the good fortune to find a bright diffused light at his disposal on any day set apart for the taking of a large group that such feels happy, and looks forward with confidence and pleasure to the result of his labours, for this means a very much less amount of anxiety and trouble—especially in a case when there are so many tastes to cater for and interests to please—than when bright sunshine stares him in the face.

Apart from the good or bad luck attending an operator in regard to the light he has to employ, there are other well-recognised essentials in the photographing of groups which, as a rule, he has under his command, attention to which will go far to ensure success. Among these may be noted the necessity for making all arrangements as to space for the grouping beforehand, the posing, so as to avoid too much front light, and the avoidance of any appearance of undue haste or excitement in his operations.

When any one has the bad luck to find himself face to face with a group appointment under the glare of brilliant sunshine, the best thing he can do is to look about for some suitable spot where there is sufficient shadow to allow of his party being grouped together without the direct rays of the sun shining on them. This may mean under the shade of some large tree or gable of a house, or, provided the party is a very small one, say, consisting of merely two or three sitters, some method of shielding them from the sunlight may be resorted to. I have known a family umbrella do good service in this way, when the same was held outside the view of the lens, but in such a position as to cut off the sun's rays from the faces. Of course, in cases where large numbers form the group, such a simple dodge is of no avail, and, as I have stated, some suitable shaded spot ought to be selected, and, until such has been acquired, the sitters should not be brought together. Having found a suitable place, an operator has really overcome the most troublesome part of the operation, and is then free to set about making other preliminary arrangements; these comprise measuring off an amount of space that will comfortably contain the number forming the group, the extreme limits of this space should then be marked off by means of little stones, so as to enable the operator to know at a glance that his lens will take in all those grouped within such space. This done, the camera is set up, and, the kind services of some friend being secured, he is placed at different points inside the space which eventually the party will occupy. The camera is then racked out so as to secure a good focus for all points, and a suitable stop inserted in the lens to cover the plate well up to the edges, and give sufficient depth of definition, the slide with sensitive plate placed in camera, over which is thrown the focussing cloth, the lens capped, and all is then ready for exposure.

When these preliminaries have been attended to, the party should be politely requested to take up their positions inside the space marked off by little stones, and taking care that too many costumes of similar colours are not grouped together; a firm but polite command "to keep quite steady" seldom fails *at the first attempt* to be effectual in securing the entire lot without movement. By going about the work systematically, and making all arrangements beforehand, the sitters are never wearied, nor have they time to get restless, and most likely the only remarks offered will be those of surprise at the rapidity with which the entire operation was carried through.

When working in a nice diffused light, free from any shielding of trees or other objects, it is most essential that the spot selected should be such as will permit of a side light being used. With this the utmost amount of roundness and true form will be given to the faces, and this means pleasing likenesses. A too front light will tend to flatten the features and destroy numerous fine shadows from draperies that help so much to give pluck and vigour in the resulting picture.

Another very popular class of outdoor subject at the present time is instantaneous work, and since the hand camera has become almost universally popular perhaps there are more plates spoiled by using such cameras under unsuitable conditions of lighting than in any other branch of photography. Hand-camera work is by no means so easy or simple as many beginners seem to imagine. It takes a considerable amount of experience to be able to judge when any view or close subject is sufficiently well lighted for such rapid exposures as are generally given by a focal plane or spring shutter attached to the lens of a hand camera.

Further, there is the difficulty, without practice, of holding the camera steady and at a proper elevation in relation to the distance of the objects being photographed, and also the getting of all that is wanted in an upright position on the sensitive plate.

I often think beginners are badly advised in starting with a hand camera, for in numerous respects it is more difficult than photographing from a fixed standpoint, requiring also no little experience to develop successfully such rapid exposures.

In instantaneous work by ordinary cameras from fixed positions, a worker will hardly ever meet with such similar conditions in the subjects brought before him, therefore such work calls for a considerable all-round photographic experience. Not only must the light be of the greatest brilliancy, but the atmosphere must be clear, and in large cities this is but seldom obtainable.

There is also the difficulty when photographing such subjects as street scenes and buildings, with their ever-varying moving objects, in the shape of vehicles and pedestrians, in getting the foreground and distance in fairly good focus when using lenses with large apertures, and very frequently there is no little difficulty in securing a suitable standpoint to work from.

In such subjects as street scenes there is no latitude in the way of altering the speed of the shutter to suit the particular nature of the view.

The first essential is to find out beforehand the speed the shutter must be driven at to yield a negative that does not show any movement in the case of, say, a trotting horse, or whatever the greatest speed of any object is found to be that *crosses the field of view*, for there is a great difference between an object approaching or retiring from the point of view and that of the same going straight across the picture. This, once obtained by practice, should be looked upon as a fixed factor for that particular kind of subject, and, once obtained, should never be altered. Some workers imagine that, because the light is not so good to-day, the shutter should be altered so as to go slower, and thereby yield a longer exposure, but this only tends to show movement. There is no use attempting street scenes unless under the most favourable conditions of light and atmosphere. I know quite well there are cases where some views are better lighted than it is ever possible to get others, and, this being so, a more rapid exposure could be given in such well-lighted cases; but the speed of the shutter should never be taken into consideration otherwise than the bearing it has on the fastest motion of any object in the picture, and, where the view is so well lighted as to permit a quicker exposure, it is quite unnecessary to alter the speed of the shutter, for it is quick enough already; therefore any alteration on account of excess of light should be made with the stops, not the shutter, and by such a procedure an advantage is gained for the smaller stop, will assist the lens to cover better, and also to work with a greater depth of focus.

During the past summer it has fallen to my lot to photograph very many of the principal streets in Glasgow, and in my next I hope to refer to a few points that struck me as important when carrying out this work. There is certainly a very wide difference in exposing 12×10 plates from fixed standpoints to blazing away, plate after plate, with a hand camera in close proximity to a moving crowd. The one requires, to say the least of it, some care and caution, even from

an economical point of view, as compared with the cost of a modest quarter-plate; but, when dealing with large-sized plates, an operator somehow or other seldom makes a failure, and I suppose this is on account of the necessity there is for the utmost care and consideration displayed in only exposing such large plates under suitable conditions. T. N. ARMSTRONG.

PLATINUM TONING OF ILFORD MATT P.O.P.

[Photographic Scraps.]

THE treatment of gelatine prints with platinum toning baths has hitherto been almost invariably followed by a degradation of the lighter parts of the prints, which has prevented our recommending the use of any formula hitherto proposed.

It has been evident however, that many users of Ilford P.O.P., more especially of the matt variety, desired a ready means of obtaining warm brown and sepia tones on that paper. It is with pleasure that we are now able to give a most reliable and ready method of producing such tones.

The formula for the bath is :—

Chloro-platinite of potassium...	2 grs. (or two drachms of stock solution).
Alum	...100 grains.
Salt	50 ,,
Water	10 ounces.

The chloro-platinite is now procurable from all dealers, in fifteen-grain sealed tubes, just as chloride of gold is sold.

The tube is broken and contents put into fifteen drachms of water. This forms the stock platinum solution, which should be kept in the dark.

Distilled water should be used for this solution, and even then the solution will become dark in colour in a few days. If, however, it does not become turbid or throw down a sediment, it will work just as well as the freshly made solution. Impure water will give a dark and turbid solution quickly, and then it becomes unsuitable for use.

The print must be first *thoroughly* washed, as for gold toning.

The bath, as per formula, is ready for use at once, and the quantity given will tone one sheet of paper.

When made up and not used, it will keep good for several days, but after use it is best to throw it away and make up a new bath when next required.

Be careful with the quantities, especially of the salt, as salt has a very great influence on the result; an excess of salt slows the bath very much, and makes the resulting tones redder, whilst a decrease allows the platinum to deposit too rapidly, and tends to give the print a dirty-brown tint in the half-tones.

Toning proceeds very steadily, the prints alter but slightly in appearance either on the surface or on being examined by transmitted light, the colour of the image changes gradually from a yellowish red to a brownish red, and at ordinary temperatures toning should not be continued for more than five minutes, or the dirty-brown tint mentioned above will result. The shorter the toning the redder the print, of course, and some little experience will be necessary in order to obtain the exact colour required.

As the prints are withdrawn from the toning bath, they should be placed at once into a salt bath (½ oz. to 20 ozs. of water) to stop the progress of toning. If placed in plain water, a strong continuing action takes place, and the prints first placed in the water will be over-toned before the others are ready. This continuing action may be taken advantage of if the toning bath is working slowly for any reason, but the progress must be watched closely, as the toning action is almost as quick in plain water as if the prints were left in the toning bath.

After the prints are all toned and in the salt bath, they should be thoroughly washed in five or six changes of plain water, and are then ready for fixing.

Do not touch hypo, or allow it to be anywhere about, until the toning and washing are quite completed, or stains will inevitably occur on the prints.

When put in the fixing bath, which should be of the usual strength, as for gold-toned prints, the colour of the image quickly changes and gives indications of what the resulting print will be like, allowing, of course, for the fact that the prints will dry a *little* darker and *little* colder than they appear when wet.

Fix for about ten minutes and wash as usual, for two hours, in running water or six or seven changes. Keep prints moving, so as to prevent them sticking together, both in toning and fixing baths and in the various washings.

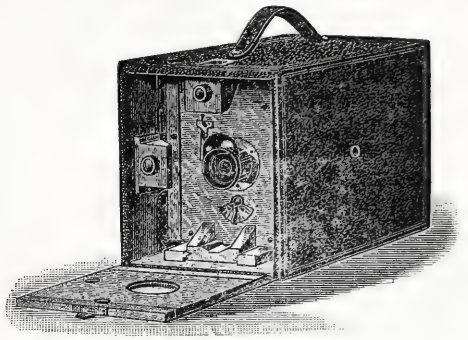
For this platinum toning bath prints should be made not quite so deep as for ordinary gold toning, the loss in toning being somewhat less.

Prints of a rich black colour can be obtained by taking the prints from the above toning bath and putting them, after a slight wash, into the usual gold and sulphocyanide toning bath for a few minutes and then washing and fixing as usual, but it must be borne in mind that such results can only be obtained when the negative is a good one, full of "pluck" and gradation.

These methods of toning are applicable to the glossy P.O.P. as well as the matt, but the result is scarcely so pleasing.

THE NEW EASTMAN KODET.

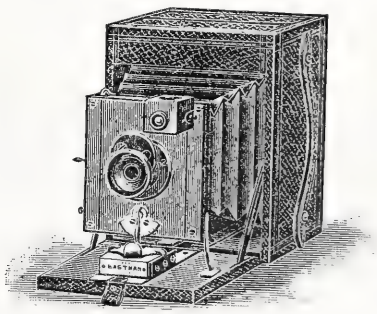
WE have pleasure in bringing to our readers' notice a new camera just introduced by the Eastman Company, 115 Oxford-street. It is called the "Kodet," which, while possessing all the advantages of the Kodak as regards lightness, compactness, and simplicity of manipulation, is yet sold at a price which puts it within the reach of those who do not feel inclined to purchase one of the more expensive instruments. The Kodet is especially designed for use with glass plates, but it can be



employed with roll film by the addition of a Kodet roll-holder, without alteration to the camera. It carries three double glass plate-holders, or one roll-holder, with capacity for forty-eight exposures.

The Kodet is made into two styles, "Folding" and "Regular," and each style is made in two sizes, taking pictures 3¼ × 4¼ and 4 × 5 inches respectively. One special advantage of the Kodets is their extreme lightness, the No. 3, folding, with one double plate-holder, weighing only 2 lbs. 1 oz., and the No. 4, folding, with one double plate-holder, only 2 lbs. 7 ozs.

The Kodet is arranged for both time and instantaneous exposures; is



fitted with either a single or double combination lens, strictly rectilinear, and of great rapidity, provided with revolving stops; can be focussed with the index or on the ground glass; is fitted with finder for horizontal or vertical exposures.

All the Kodets are thoroughly well made in every particular, handsomely finished, and covered with leather.

Two views of the Kodet are shown in the foregoing cuts.

Our Editorial Table.

PICTURE-MAKING BY PHOTOGRAPHY.

By H. P. ROBINSON. London: Hazell, Watson, & Viney, Limited.

THE fact of this being a fourth edition of Mr. Robinson's book speaks well for the appreciation of the photographic public. In reviewing the first edition, eleven years ago, we remarked that Mr. Robinson possessed a trinity of qualifications for the writing of such a work: he is a good technical, practical photographer; he is an artist; and he is a facile writer and a master of the art of conveying his ideas to others in a manner capable of being understood. In *Picture-making* all of these qualifications are brought into requisition with unquestionable effect. The very beautiful transcripts of his own pictorial

work amply attest the first two, while every page of the work equally attests the last. Besides minor illustrations, the author's well-known pictures, *A Merry Tale* and *Wayside Gossip*, are here admirably reproduced. Need it be said that the little volume has our heartiest commendations? Price 2*s.* 6*d.*

Messrs. Arthur & Co., of St. John's-road, Penge, have submitted to us specimens of their work in zinc and copper block etching in half-tone. The specimens evince much excellence of quality.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 1075.—"Improvements in the Production of Prints by Photography, or by Photography combined with Typographic or other Printing, and in Apparatus for the purpose." W. Friese-Greene.—*Dated January*, 1895.

No. 1083.—"Improvements relating to Screens for producing Printing Surfaces by the aid of Light." G. Whitehead.—*Dated January*, 1895.

No. 1115.—"Improvements in Kinetoscopes." J. Anderton and A. Lomax.—*Dated January*, 1895.

No. 1287.—"Improvements in and relating to Optical Lanterns, Science Lanterns, and Enlarging Apparatus." J. H. Barton and J. Stuart.—*Dated January*, 1895.

No. 972.—"Improvements in Copying-Diaphragms for Photographic Purposes." E. Hrudnik.—*Dated January*, 1895.

No. 1028.—"Improvements in Kinetoscopes." A. Lomax.—*Dated January*, 1895.

No. 1029.—"Photo-engraving of Metal Plates for the Decoration of Earthenware and for Printing on Paper." W. A. Whiston.—*Dated January*, 1895.

No. 950.—"The Manufacture and Production of a New Material for use in obtaining Oxygen from Atmospheric Air." H. Weymersch.—*Dated January*, 1895.

No. 1509.—"An Improved Method of and Apparatus for Changing Plates in Photographic Cameras." Communicated by A. Tournier. B. J. B. Mills.—*Dated January*, 1895.

No. 1688.—"Improvements in and connected with Photographic Cameras." F. I. Ricarde-Seaver and L. Pernot.—*Dated January*, 1895.

PATENTS COMPLETED.

Improvements in the Manufacture of Photographic Plates.

(Communication by the Chemische Fabrik auf Actien vorm. E. Schering, 170, Müllerstrasse Berlin.)

No. 3477. August Zimmermann, 6 and 7, Cross-lane, St. Mary-at-Hill, London.—*December* 22, 1894.

This invention relates to a new process of producing hardened light or colour-sensitive gelatine, bromide of silver gelatine emulsion, for example, by formic aldehyde.

As described in the Complete Specification No. 2036, of 1894, a gelatine solution sets on the addition of a large amount of formic aldehyde to a gelatinous mass, which is insoluble in water, and which cannot be melted (example, add three cubic centimetres of a thirty-six per cent. formic aldehyde solution to 100 grammes of a warm twenty per cent. gelatine solution). If very small quantities of formic aldehyde be added to melted gelatine, the solution sets on cooling, but may be easily remelted. When, however, the gelatine so treated is allowed to dry upon a surface, an elastic flexible skin, quite insoluble in water, is produced.

Now, if the formic aldehyde solution be added to gelatine emulsion sensitive to light in such quantities that the emulsion is, after drying, insoluble in water, no prejudicial effect, but perhaps rather a favourable effect, is thereby produced on the substance sensitive to light.

To carry out this process, small quantities of formic aldehyde solution (more or less, according to the degree of hardness required) are added to, for example, bromide of silver emulsion before use, and the emulsion then poured in the ordinary way, all chemically active rays being excluded, upon plates, papers, or other carriers, such as, for example, upon the gelatine film described in the Complete Specification, No. 2036, rendered insoluble by formic aldehyde. In the latter case a compound film is produced, the under film of which is formed of formic aldehyde gelatine, and the upper film of light-sensitive formic aldehyde gelatine.

The process also applies to colour-sensitive gelatine, such as, for example, bromide of silver gelatine emulsion, which has been treated with erythrosine.

The finished formic aldehyde plates may also be rendered colour-sensitive in the usual manner.

To produce the before-mentioned compound film, the gelatine carrier insoluble in water, described in the Complete Specification No. 2036, is first produced, the light or colour-sensitive silver halide gelatine emulsion mixed with small quantities of formic aldehyde then poured upon it; it is then allowed to dry, and the compound film either left on the carrier or stripped off.

Claims:—1. The production of hardened light or colour-sensitive gelatine films, consisting in adding small quantities of formic aldehyde to the light or colour-sensitive gelatine emulsion, before pouring it upon the plate in such a manner that the film is, after drying, insoluble in water. 2. The use of the process claimed in Claim 1 in such a manner that a compound film is produced by employing a gelatine film rendered insoluble in water by formic aldehyde according to the Specification No. 2036, and by pouring upon this the light or colour-sensitive gelatine emulsion mixed with small quantities of formic aldehyde, and allowing it to dry, the compound film thus produced being either stripped off the glass or metal plate serving as a carrier, or left on the same. 3. Rendering the light-sensitive gelatine films referred to in Claims 1 and 2 colour-sensitive by dipping them into a colour-sensitive solution.

Improvements in Photographic Cameras and the Like.

No. 5374.—J. Cole, Farleigh Hotel, Amhurst-road, Stoke Newington, Middlesex.—*December* 29, 1894.

This invention for improvements in photographic cameras and the like has for its object to provide the camera with a rising and falling front, whereby the lens or lenses can be placed while focussing at the extreme top edge of any plate or film, so that the principal object in the photograph can be produced on any desired part of the sensitised plate or film, and the greatest possible advantages secured in photographing high buildings and the like.

Hitherto, in cameras with rising and falling fronts, the lens has been attached to a front sliding in grooves in the end of the camera body, so that the rising and falling motion of the lens was comparatively small.

Now, in a camera constructed according to this invention, the lens is attached to a flexible front, consisting preferably of a number of flat slats mounted on a flexible back, and sliding in grooves at the sides of the camera body, and extending from top to bottom of the front end of the body, and some distance backwards. The front is of such size that, when the lens is at the top, the lower edge of the flexible front is at the bottom of the camera body, and, when the lens is at the bottom, the top edge of the flexible front is at the top of the camera body. When moving the front, its ends, being guided by the grooves, pass over the top or under the bottom, as the case may be, so as to leave no vertical projections.

The sliding front is preferably operated by rack-and-pinion mechanism. A shaft carrying two pinions is attached to the front just above or below the lens, and racks are attached to the front of the body at its two sides, so as to gear with the two pinions.

Improvements in Means or Apparatus for Separating and Manipulating Glass Plates or Flexible Films in Photographic Cameras or Changing Boxes for Same.

No. 7928.—William Cuthbertson, 2, Ashgrove-terrace, Partickhill, Glasgow, Lanarkshire.—*December* 29, 1894.

My invention has for its object to provide means whereby plates or films of the ordinary make without special preparation or cutting can be separated one after the other or in pairs from a series of such plates or films for exposure in the camera, and afterwards deposited at the back of the original series of plates or films, or in a separate light-tight box arranged for their reception. This improvement in the means and apparatus for separating plates or films is applicable to either self-contained cameras or to changing boxes used with ordinary bellows cameras. I will describe it as applied to a changing box for an ordinary bellows camera, which will also show its adaptability for separating and manipulating films or plates in a self-contained camera. According to my invention, the plates or films are placed in a box one on top of the other. The box is made of such dimensions internally as to admit of the plates or films being slightly turned to the left and to the right alternately as they are deposited in the box, the centre axis of the plates being the same. The box is so constructed as to retain the plates or films in the slightly turned position in which they are deposited in the box. The box is fitted to a frame, the inside dimensions of which frame are large enough to admit of the plates or films dropping freely through. The box is fitted to the frame in such a manner as to permit its being turned to the left and right on its centre axis to the same extent as the plates or films are turned when deposited in the box, and the action of turning the box to the right or left in relation to the frame has the effect of dropping a plate or film for each separate motion. Springs are arranged so as to press forward the unexposed plates or films as they are removed, but not to interfere with the space left for the reception of the exposed plates or films. The box and the frame are both fitted with a light-tight sliding door for the purpose of allowing the plates or films to be deposited in and removed from the box. The box and frame also have the necessary fittings for attaching to each of them a dark slide. This dark slide is fitted with two sliding doors similar to those in ordinary use, but one door is made sufficiently large to admit of a plate or film dropping through into the slide when opened, and is fitted with a spring to press on the back of the plate or film after it has dropped, for the purpose of keeping it in position. In working this apparatus the dark slide need not necessarily be removed from the camera, but each side of the box and frame containing the unexposed plates or films may be attached to it alternately, and a plate or film deposited in or removed from it, the camera being held with the lens pointing downwards when the plate or film is being deposited, and pointing directly upwards when the plate or film is being removed. This dark slide can also be made to take two plates or films by a special attachment being fitted to the sliding door, through which they are dropped, to prevent their falling out when this door is opened for the purpose of exposing one of them in the camera.

An alternative arrangement to the box and frame described above for the separation of the plates or films is to have the box of a circular shape, and fitted so as to make a complete revolution in the frame. The plates or films in this case are deposited in the box on the top of each other as in the first case; but, instead of being slightly turned on their centre axis to the right and left alternately, they are all slightly turned on their centre axis in one direction, and the box is so constructed as to retain them in this position. In this arrangement the plates or films are dropped by turning the box through a certain part of a circle, according to the amount the plates or films are turned in relation to one another, stops being arranged so as to hold it in position after it has travelled the necessary distance for dropping a plate or film.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
4	A. A. Camera Club	Demonstration: *The Eastman Photographic Papers.* W. J. Ramsey.
4	Camera Club	Smoking Concert.
4	North Middlesex	
4	Peterborough	
4	Richmond	Club Competition Lantern Slides.
4	South London	Demonstration: *Amateur Dry-plate Making.* R. Child Bayley.
4	Stereoscopic Club	
5	Birmingham Photo. Society	
5	Bolton Photo. Society	
5	Brixton and Clapham	Series of Slides by T. J. Bartrop.
5	Exeter	
5	Gospel Oak	Demonstration by the Eastman Company with their Papers. W. J. Ramsey.
5	Hackney	Open Night.
5	Halifax Camera Club	*Portraiture.* A. Priestley.
5	Herefordshire	
5	Keighley and District	
5	Lewes	
5	North London	
5	Oxford Photo. Society	
5	Paisley	
5	Rotherham	
5	Sheffield Photo. Society	
5	York	
6–8	Bournemouth	Photographic Exhibition.
6	Croydon Camera Club	Photographic Chat.
6	Edinburgh Photo. Society	
6	Leytonstone	
6	Midland	*Popular Authors and their Work.*
6	Photographic Club	Members' Open Night.
6	Southport	
6	Southsea	
7	Birmingham Photo. Society	
7	Camera Club	*Old Touraine.* Commander C. E. Gladstone, R.N.
7	Dundee and East of Scotland	
7	Ealing	Lantern Evening.
7	Glasgow Photo. Association	
7	Glossop Dale	
7	Hull	
7	Leeds Photo. Society	
7	Liverpool Amateur	*Lantern-slide Making.* Mr. Anyon.
7	London and Provincial	*Some Further Experiments in Colour Photography.* E. J. Wall.
7	Oldham	
7	Tunbridge Wells	
7	West London	Annual Dinner.
7	Woodford	Display of Members' Slides.
8	Bristol and West of England	
8	Cardiff	
8	Croydon Microscopical	
8	Halifax Camera Club	
8	Holborn	
8	Ireland	
8	Maidstone	
9	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 24,—Mr. Snowden Ward in the Chair.

Mr. THOMAS BEDDING said he was sure the members of the Association would be pleased to know that their fellow-member, Mr. A. Haddon, had been elected President of the Photographic Convention of the United Kingdom. He moved that their best congratulations be tendered to Mr. Haddon.

In acknowledging the applause of the meeting at this announcement, Mr. Haddon said he hoped his fellow-members of the Association would support him at the Shrewsbury meeting.

Mr. T. E. FRESHWATER then read a paper on *Photo-micrography.* He showed a large number of microscopic slides on the screen, including rock and crystal sections, parasites of birds, &c., and their eggs, and many popular subjects, taken with ordinary and monochromatic light. At the conclusion he received a hearty vote of thanks.

PHOTOGRAPHIC CLUB.

JANUARY 23,—Mr. Thomas Bedding in the chair.

Mr. E. W. FOXLEE presented a number of photographic relics to the Club. They consisted of some excellent specimens of glass positives and Daguerreotypes.

The CHAIRMAN proposed, and Mr. TOTTEM seconded, a hearty vote of thanks to Mr. Foxlee.

Mr. F. A. BRIDGE suggested that a case to keep these and other relics in be provided.

Mr. TOTTEM showed a new model Bull's-eye camera, which had just arrived from the Blair factory in Boston. The original Bull's-eye for rollable film only was shown last August. The present one was the outcome, more or less, from suggestions then made by members of the Club for a similar camera to carry plates in double holders as well as rollable film. The new model is readily interchangeable from a film to a plate camera. Replying to a question, Mr. Tottem said the camera could be obtained through dealers or the European agents, the European Blair Camera Company.

The HON. SECRETARY handed round the Club report for the past year, together with a photogravure from plate etched by Mr. H. Wilmer before the Club in June last.

Mr. BIRT ACRES then proceeded with his *Talk about Light*, during which he made, for the edification of members present, some interesting experiments. Owing to the hotel arrangements preventing the meeting being opened at the advertised time, Mr. Acres had to curtail both his remarks and experiments. During the time at his command, he brought forcibly home to photographers some of the principles of his subject.

At the conclusion, the CHAIRMAN remarked that they would await with interest details of the safe dark-room light mentioned by Mr. Acres. He proposed a very hearty vote of thanks to him, which was seconded by Mr. TOTTEM and carried unanimously.

Mr. ACRES thanked his fellow-members for the attention they had given to himself and the two gentlemen who had come down to assist him. After further experiments, he would be most pleased to make public any information useful to photographers. Responding to Mr. Tottem's request to publish his paper, he said he would be pleased to allow it after some slight alterations had been made.

Brixton and Clapham Camera Club.—January 15.—A paper entitled *Some Forgotten Pages in Photographic History*, was read by Mr. W. H. Harrison (Vice-President). The success of two members of the Club in the recent National Lantern-slide Competition was announced, and a gross of Thomas's lantern plates, sent to the Club as an entrant, was distributed. Sample packets of Cadett "Lightning" plates were also distributed, and a member recommended that, if one had occasion to photograph a nigger chasing a black cat round a coal-cellar at midnight, he should try this brand. The officers of the Club elected for 1895 are:—*President:* Dr. Reynolds.—*Vice-Presidents:* Messrs. J. W. Coade, W. H. Harrison, and G. P. Wyatt.—*Council:* Messrs. C. F. Archer, T. J. Bartrop, E. Dockree, F. Goldby, W. Thomas, and G. W. Welham.—*Librarian and Curator:* Mr. R. G. F. Kidson.—*Lanternist:* Mr. R. G. Mason.—*Auditors:* Messrs. F. P. Knights and T. F. Osborn.—*Delegates to the Affiliation of Societies:* Messrs. E. Dockree and W. Thomas.—*Hon. Secretary:* Mr. F. W. Levett, 11, Corrance-road, Acre-lane, S.W.

JANUARY 22, Mr. F. Golby in the chair.—Mr. R. G. F. Kidson read a paper, accompanied by a demonstration on *Toning Bromide Prints by means of a Hot Bath, consisting of Hyposulphite of Soda and Alum*, the effect being to partially convert the silver image into a sulphide of silver. The tones obtained were very pleasing, and the finished specimen prints shown were much admired. After the paper, an interesting discussion took place upon methods of toning bromide and platinum prints, in which Messrs. Dockrie, Thomas, Rogers, and others took part. Mr. THOMAS mentioned some peculiar effects he had recently obtained in experimenting with platinum prints.

Gospel Oak Photographic Society.—January 15.—A practical demonstration in development with amidol-Hauff, by Mr. G. D. Adams, took place, which proved of great interest. After one or two plates had been developed, a very good print was made on a piece of Lyons bromide paper. At the next meeting, on February 5, a demonstration with the Eastman papers, by Mr. Ramsey, will take place; visitors invited. All communications to be sent to the Hon. Secretary, Mr. W. A. Palmer, 13, Dale-road, Kentish Town, N.W.

Hackney Photographic Society.—On the 22nd inst., an Exhibition of work done at the Society's outings during the past season was held at the Y.M.C.A., Mare-street, members and their friends being present. The following awards were made:—Silver medal, Mr. J. J. Westcot, for *A Reedy Corner;* silver medal, Mr. G. Guest, for best collection of pictures taken at Club outings; bronze medal, Mr. F. W. Gosling, for best set of lantern slides; certificate, Mr. F. E. Roof, for *Interior, St. Alban's Cathedral.* During the evening an informal concert was given, several members and their friends obliging with songs and recitations.

North Middlesex Photographic Society.—The Annual General Meeting of this Society was held on Monday, January 14.—The PRESIDENT (Mr. Marchant), in presenting the report of the Council on the year's work of the Society, traced the growth, from thirty-eight members in 1890 to ninety-three in 1894. The season had been a very successful one, many capital papers and demonstrations having been listened to by large attendances of members. The last Exhibition had been a great success from every point of view. Mr. PITHER, in presenting the report of the outings, stated that fifteen outings had been held during the past season, 140 prints being sent in for competition, Mr. J. C. S. Mummery taking first honours, and Messrs. E. R. Mattock and S. E. Wall tying for second place. The Hon. Treasurer presented his balance-sheet, which showed that, notwithstanding the large expenditure in apparatus last year, he still held a balance in hand of 9*l.* 10*s.* 8½*d.*, compared with 11*l.* 7*s.* 2½*d.* of the year before. A vote of thanks was unanimously given to Mr. G. Gosling on his retirement from the post of Hon. Secretary, a post in which he had done considerable good work. The meeting then proceeded to elect the officers and Council for the coming year, which resulted as follows:—*President:* Mr. J. W. Marchant.—*Vice-Presidents:* Messrs. C. Beadle and S. E. Wall.—*Council:* Messrs. F. W. Cox, E. R. Mattocks, F. L. Pither, A. J. Golding, W. B. Goodwin, H. Walker, C. O. Gregory, H. Stuart, A. J. Johnson, E. Spencer, C. H. Dawkins, Livett.—*Curator:* Mr. J. W. Simpson.—*Treasurer:* Mr. H. Smith.—*Hon. Secretary:* Mr. John H. Avery. The meeting then closed.

Putney Photographic Society.—January 24, Mr. F. Chasemore in the chair.—Mr. T. H. STRINGER very ably gave a practical demonstration on the *Platinotype Printing Process.* After making introductory remarks, in which he laid special stress on the necessity of keeping the paper perfectly dry both before, during, and after printing, he proceeded to develop several prints by the cold-bath process, and also developed some large prints by pinning to a board and brushing on the developer (this having been previously mixed with glycerine, which has the effect of considerably retarding development, thus allowing time to bring up those parts that require strengthening, by brushing on strong developer without glycerine). The demonstration was followed

with much interest by those present, who greatly admired the beautiful results obtained, and also commented upon the simplicity, ease, and quickness with which the whole process is carried out. A vote of thanks to Mr. Stringer concluded the proceedings.

Richmond Camera Club.—January 14, Mr. Cembrano presided.—The announced demonstration of *Printing and Enlarging on Bromide Paper*, by Messrs. Davis and Ardaseer was divided up, and this evening Mr. ARDASEER enlarged upon contact printing, while next week Mr. Davis will come in contact with enlarging, the demonstrations forming part of the series of elementary instructions arranged for the session. Mr. Ardaseer alluded to the advantages and disadvantages of bromide paper, chief amongst the former being its suitability for use by artificial light and the rapidity with which prints can be produced, conspicuous amongst the latter being the difficulty of getting permanent results in anything but black and white. He then described the class of negative most suitable for bromide printing, handing round specimens, and, after giving full and practical instructions on the subject of exposure, concluded by exposing and developing several prints.

ON the 21st ult., Mr. Cembrano in the chair, Mr. DAVIS gave an instruction on the subject of enlarging on bromide paper. After laying down the principles which must be observed in enlarging under all circumstances, he explained the usual methods of making enlargements by daylight and by artificial light with and without a condenser, and gave some practical hints on the subject of exposure, recommending, in the case of daylight enlarging, the use of an actinometer to test the light, and that beginners should enter in a note-book the conditions of every exposure they make. He showed specimens of enlargements of from four to ten diameters and described different modes of printing in clouds and other details connected with the subject. Finally, with the aid of a cantilever and a Welsbach light, Mr. Davis enlarged a portrait of the President (taken as one of a group on a Club excursion) which, on being developed, was pronounced a good likeness. Mr. Cembrano added some valuable hints, and one or two other members joined in the discussion.

Woolwich Photographic Society.—January 24.—COLONEL C. D. DAVIES, in a little speech of welcome, called upon Mr. WALTER WELFORD to proceed with his lecture on *Hand-camera Work*, in course of which the lecturer said. "As the title of my paper indicates, it is the work of the hand-camera rather than the actual instrument that will be dealt with to-night. Thus you will not find the philosopher's stone, 'the best hand camera,' nor will our time be occupied in discussing the merits of the different patterns. One of the first points to tackle is that of the man. Far too much attention is devoted to the instrument, to development, and the other technical details, whilst behind lies the shadow of something even greater in importance—the man. It has taken the photographic world—that is, the non-hand-camera portion of it—a long time to appreciate the fact that the successful use of a hand camera is not nearly so easy as imagined. Indeed, it is in reality more difficult to use well than the ordinary camera. But, even now, when this is coming home to the mind, the real meaning of it is still unfathomed. It is because hand-camera work requires a special breed of men and women—'new men' and 'new women,' in fact. The tripod man, who, by means of a view-meter, maps out his subject perhaps weeks beforehand, focuses for half an hour, and trying various apertures to the lens, shifting his point of view occasionally, who levels up his camera by apparatus, who calculates the exposure by a table or meter, and who will wait hours for the correct lighting, is not the man for the hand camera. All this must be altered to quick perception, prompt decision, and instant action, and that without losing a cool head. Some men are good hand-camera workers at the start—they are born so; others acquire this speed of thought and action gradually; whilst there are others who will never do very much with it. The old idea was, given a good hand camera, meant success; this must be altered to, given a good or suitable man, the hand camera is of no account. Of course practice will do much, and very naturally the idea suggests itself that the successful workers are those who have used it constantly, as distinct from those who only take it up now and then, but, nevertheless, continue the regular use of their first love—the stand camera. The old adage holds good in this case: 'Be sure you're off with the old love before you're on with the new.' The successful worker, in a word, is the one who practically gives up the stand camera altogether. He cultivates quick work, and his mind and body follow. He grows quicker in both thought and action. In referring to this part of hand-camera work, it may be urged that I am losing sight of artistic work, whatever that vague term may mean; but for two reasons it will be seen that such is not the case. First, I believe the hand camera to possess an educational power as regards speed of thought and action. It quickens the perception, and we can see the same thing as before, only in less time. Secondly, beyond all this, the art side is much too limited a sphere for the hand camera. Art photography, as we glean it from the writings and exhibitions of to-day, forms only one branch of many upon the same tree—photography. As I have 200 slides to show you, the preliminary remarks must be brief. This consideration can be dismissed with the summary that, though natural aptitude is certainly a factor, it is not a dominant one. The whole secret of successful hand-camera work lies in practice. One point to be mentioned is cheapness. Some will purchase a ten-and-sixpenny hand camera, and expect to get good results; such an idea will only meet with disappointment. Some who insist upon having the best of everything for a stand camera—they want the best lens and apparatus—and yet, on taking up hand-camera work, they do not mind buying a cheap one. I protest that it is not a fair way to test hand-camera work. With these brief thoughts I will get on with the slides, which have been entirely chosen to illustrate the many directions in which the hand camera can be utilised." The lanternist then proceeded to put the slides through the lantern, and, as they appeared upon the screen, the lecturer described them, and enlarged upon the type of work they represented. Mr. Welford confessed that street scenes are his hobby, and urged his audience to take up that class of work. At the conclusion the lecturer resumed his seat amid hearty applause.

Aintree and District Society of Photographers and Lanternists.—anuary 25, Mr. W. B. Hellon, President, in the chair.—The award (made by the Liverpool Amateur Photographic Association) for the Lantern Slide Competition, was announced as follows:—1st prize, Society's silver medal, Mr. W. B. Hellon (President); 2nd prize, Thornton-Pickard shutter, Mr. D. J. Neill (Hon. Treasurer); 3rd prize, bronze medal, Mr. W. Lockier (Hon. Librarian). During the evening, the whole of the competition slides were passed through the lantern, together with the prize slides of the Liverpool Amateur Association; the result of the Print Competition will be announced at the February monthly meeting, at which Mr. W. B. Hellon will demonstrate on *Developing*.

Bath Photographic Society.—January 11, Mr. Aug. Perren in the chair.—Mr. ERNEST LAMBERT, in describing a means of applying the camera to use with a microscope for producing enlarged photographs of very minute objects, drew attention to the two great scientific uses to which photography in the last few years had been carried, *i.e.*, micro-photography (or the photographing of the infinitely little), and tele-photography (or the photographing of the infinitely great). He showed some examples of the former, which he had made himself by means of the apparatus before them, and the latter he was able to illustrate by some of Mr. Dallmeyer's beautiful photographs taken with tele-lenses, which he had also sent down for Mr. Lambert to show and explain. Mr. AUSTIN J. KING read a paper, entitled *The Hand Camera: how it may be Used, and how Abused*. At the conclusion of the paper Mr. King exhibited, by means of the lantern, numerous examples of work illustrative of the points referred to in the paper, some of which were kindly sent by Mr. Birt Acres on the Barnet plates, and others by Mr. T. C. Hepworth. At this stage there was an interval for refreshments and opportunity to view the display of members' work. Resuming, Mr. PUMPHREY gave a lucid description of the working of a Staffordshire coal mine, and his remarks were illustrated by means of an excellent series of photographs taken under the most difficult circumstances. All the pictures shown were obtained by mean of artificial light, both above and below the earth surface, a train of pyrotechnic compounds being fired to illuminate the subjects during exposure to the camera. The views, which were of the most excellent quality, were also shown by means of the lantern. Some lantern-slide pictures of the recent floods were then shown by Mr. Perren, the President of the Society, who also exhibited views of the same places flooded in 1882, showing conclusively that the 1894 flood had not beaten the previous record by many inches, which, remarked the Chairman, was another proof of the usefulness of photography. A further display of lantern pictures brought a very successful evening to a close. Among the exhibits on the walls and the tables it should be mentioned were three framed enlargements by the President, Mr. Perren; three framed portrait studies, large direct pictures, by Mr. Lambert, Vice-President; two framed collections in ferro-prussiate paper; and numerous mounted views by Mr. George F. Powell, Vice-President; a large collection of Italian views by Mr. Austin J. King, Ex-President; a large collection of Italian and other scenery by Mr. W. Pumphrey, Ex-President; framed and other views by Colonel Sealy; framed and other views by Mr. E. J. Appleby; a large collection of mounted views (local) by Miss R. M. Sotheby; five albums of views of local and other scenery by Mr. E. J. Appleby; album of views by the Very Rev. Monsignor Williams; stereograms and stereoscopes by Mr. E. J. Appleby, Mr. Austin J. King, and Mr. Pumphrey, the latter also contributing a table of transparencies. The annual dinner will take place on the 30th inst. at Fortt's. Tickets, *7s. 6d.*

Birmingham Photographic Society.—January 18.—Mr. ALFRED WATKINS, of Hereford, delivered a lecture to the members upon the *Systematic Timing of Exposure and Development*. He spoke of exposure first, and referred to the use of the tables of the sun's action at different dates and hours, as tabulated by Vogel and Scott, in which individual judgment was exercised as to whether the light is good, dull, or very dull; also of Burton's tables of subjects in which the classification is largely influenced by the amount of light falling upon the subject. These tables form the basis of all exposure tables and most exposure meters, but in his own system he broke entirely away from them, and, employing a bromide of silver actinometer to test the light actually falling on the subject, was able to classify the subject solely with regard to its colour value. Mr. Watkins explained how, in his system, the four factors of light, subject, plate, and diaphragm, were valued separately, and illustrated the application of slide rules for the purpose of calculating the exposure by means of a large model. He laid stress upon the fact that the instrument did not destroy the "personal equation," but was really used to calculate variations from one trial exposure. Four subjects (interiors, landscape, and cloud subjects) were thrown upon the screen, the exposures being calculated by the Watkins' exposure meter, and all developed together in one dish. Examples were also shown illustrating variation needed for different subjects, and a few exposures made with a pinhole were exhibited. Several questions were put by members and replied to. Passing on to the control of development, Mr. Watkins demonstrated the result of a large amount of original investigation. in each case an exposed plate had been cut in two, and the halves developed in widely different developers, the aim being to gain the same opacity in the high light, and then judge by a print whether change of gradation resulted. The first point was, that no modification of the pyro developer had power to alter the ratio of the time of appearance of the different tones. The result of modifications in the amount of alkali, pyro, and bromide, addition of citrates, tentative development, previous soaking in alkali, ditto in pyro and bromide, were all illustrated by examples on the screen, and it was shown that, where the upper tones matched in both halves (fog being absent), no change of gradation resulted. The two methods of altering value of gradation were illustrated, viz., by length of development and by fog. Mr. Watkins's new method of timing development by an observation of the time of appearance of the two halves was explained, and also the use of the eikronometer—a small clock for the purpose. He mentioned that he now found that with pyro, and most developers, variations in bromide altered the multiplying factor. A practical demonstration of the use of the method with a new developer (secret formula) devised by Mr. Harold Baker was given, being specially arranged to show that the "personal equation" of the photographer is not destroyed. Mr. Baker (who had made no previous trial of the system) had kindly exposed some plates in his studio. One was cut in two, and Mr. Baker developed one

half in full strength of his developer, noted the time of appearance (1⅛ minute) and completed the development (by his own judgment) in 3 minutes. This gave a development factor of 2¾, and Mr. Baker then developed the other half in a diluted developer, the eikronometer being used for timing. The half-tones appeared in 2¼ minutes, and, the same multiplying factor being used, the eikronometer indicated 6 minutes as the correct time. This was given, and the two halves proved to be practically identical in development. In reply to a question, Mr. Watkins said that, in some cases of gross over-exposure, a normal developer, moderately restrained, would give fog and halation, while a strong, heavily restrained developer would give the true gradations free from fog. It was the fog which made the difference.

Bradford Photographic Society.—A meeting was called at the St. George's Hall Coffee Tavern on Thursday evening, January 17, for the purpose of forming a photographic society. Mr. J. Tindell occupied the chair. A proposition was made that a club should be formed, and called the "Bradford Photographic Society" which was carried unanimously. After further discussion, it was agreed that the yearly subscription be half-a-crown, with a further call of one shilling if necessary. The following Committee were elected:—The Rev. W. H. Eastlake, Messrs. P. R. Salmon, W. Booth, J. Tindell, Q. Nicholson, and P. Wilkinson. Hon. Secretary, Mr. John Snowdon, c/o Percy Lund & Co., Godwin-street, Bradford, to whom all communications should be addressed. The meeting was attended by a large number of enthusiastic amateurs, and there are all indications of a successful career for the Society.

Leeds Photographic Society.—The inaugural lecture of the new session was given in the Albert Hall in the presence of an audience of over 1500 persons. The lecturer was Mr. PAUL LANGE, President of the Liverpool Photographic Society, and the subject was *Norway Revisited*. The proposed traveller was conclusively shown what to do and what to avoid, whilst the eye was charmed with a magnificent choice of Mr. Lange's slides. The lecturer appealed to his audience not to "rush" so beautiful a country, but to endeavour, if their holiday was limited, to see one district thoroughly, and thus put themselves in touch with the inhabitants and enjoy their hospitality and *bonhomie*. Many brilliantly coloured slides of sunrise, sunset, and moonlight effects were shown, which, it was explained, were not produced with outside colour aid, but simply by toning, and which fully raised the enthusiasm of all. Mr. Lange's genial presence, his knowledge of the subject, and his sympathy with the inhabitants of so wonderful and beautiful a country, together with the efficiency of the projections and the fulness of the large hall, made the lecture an all-round success, which quite justified the new departure taken by the Leeds Society. The chair was taken by His Worship the Mayor of Leeds (Alderman Gilston), who had previously entertained the Committee of the Society and friends in the Mayoral Chambers at the Town Hall. He expressed himself as an enthusiastic photographer, and the owner of a lantern and screen which was permanently fixed in his home. He suggested that photographic societies had a large field open to them in assisting to amuse and instruct by means of lantern evenings given to aid various causes, and he expressed his willingness to assist the Leeds Photographic Society in securing a permanent home in a proposed set of rooms to be built for the scientific societies of the city.

Leigh Photographic Society.—January 17, the President (Mr. F. Burrows) in the chair.—The seventh of the series of competitions arranged to encourage members to bring good work to the meetings was held, the subject for this meeting being *Instantaneous Work*. The first prize was awarded to Mr. R. Leigh for an enlargement of a snap-shot on the Ship Canal; the second prize was awarded to Mr. P. Seddon. Afterwards Mr. Leigh gave a demonstration of enlarging with a cantilever enlarging lantern, making an enlargement from a half-plate to 12×10; he gave two minutes' exposure on Ilford rapid paper, and developed with metol, the result was successful. Mr. Leigh explained all the parts of the lantern to the members.

Midland Camera Club, Birmingham.—January 23, Mr. C. J. Fowler in the chair.—Mr. R. J. BAILEY gave a very practical paper on *Simple Chemical Analysis of Photographic Materials*. Beginning with the usual tests for the mineral acids, the lecturer then gave a demonstration of simple tests for the sulphites, chlorides, bromides, and iodides used in photography, passing on to the cyanides, and carefully distinguishing between ferrocyanides and ferricyanides he came to the fixed alkalies, showing the advantage from a photographic point of view of potash over soda. The composition and formula of hyposulphite of soda were next dealt with, and the common impurities, chloride and sulphate of sodium, were shown to exist. Mr. Bailey strongly cautioned the members not to use acids in the fixing bath, as even in minute quantities they decomposed it and liberated sulphur. The best preventative of decomposition was the sesquicarbonate of ammonia. Mr. Spurrier brought three hand-cameras for the inspection of the members, one made twenty-five years ago, the other two being his latest inventions; one of them will be early on the market for the coming season.

Shropshire Camera Club.—January 18.—Three new members being enrolled, the HON. SECRETARY informed the members present that final arrangements had been made with Professor Malden to lecture in the large room of the Music Hall on February 12. Owing to the unavoidable absence of the President (Mr. F. W. Williams), who was down on the programme for a demonstration, Mr. F. R. Armitage, the Organising Secretary of the Shropshire County Council, gave a demonstration on *Photo-micrography*, the apparatus used being a quarter-plate instanto (Underwood), a Star microscope stand with Abbé condenser, and ordinary bull's-eye condenser. Two films (Edwards's isochromatic medium) were exposed, one with a one-twelfth inch water immersion objective, by Swift, and the other with a No. 3 Leitz objective of about two-thirds of an inch focal length. The objects photographed were the organisms from a nodule on the root of lucerne (*medicary saliva*), stained with tuchsine, and the hooklets on the wing of a honey-bee, the results obtained being highly satisfactory. A number of film negatives and prints were shown, the exposures given having ranged from twenty-five seconds to five minutes, the films, being slow isochromatic, in most cases developed with Thomas's hydroquinone formulæ. Mr. Armitage said he was afraid many were deterred from embarking on this most fascinating branch of the art by the supposed united expense of the apparatus, but he showed that, by the exercise of a little ingenuity, the possessor of a good student's microscope, suitable objectives, and an unlimited amount of patience, could easily turn out work of scientific value under ordinary circumstances. The meeting concluded with a hearty vote of thanks to Mr. Armitage for his highly interesting demonstration.

Glasgow and West of Scotland Amateur Photographic Association.—January 21, Annual General Meeting.—Six new members elected. The annual report and financial statement show that there has been an increase of membership, the total now being 304. In addition to the usual working expenses there has been a special outlay of 66*l.* in improving the dark room, and there is now a balance in the bank of 61*l.* 4*s.* 9*d.*, apparatus and furniture in the rooms valued at 163*l.* 14*s.* 6*d.*, and no outstanding liabilities. Office-bearers for 1895 were appointed as follows:—*President:* Mr. A. Lindsay Miller.—*Vice-President:* Mr. George Chalmers.—*Council:* Messrs. A. Watson, V. L. Alexander, Stewart Smith, A. C. Todd, D. F. Nicol, and J. W. Ferguson.—*Treasurer:* Mr. W. J. B. Halley.—*Librarian:* Mr. N. G. Reid.—*Lanternist:* Mr. Andrew Brown.—*Secretaries:* Mr. W. Goodwin, 3, Lynedoch-street, and Mr. J. C. Oliver, 2, Royal-terrace. The medals awarded at the Annual Exhibition were presented as follows:—Silver medals: Messrs. Stewart Smith (two), Mr. A. C. Todd, Mr. James Russell, Mr. N. G. Reid, Mr. A. Lindsay Miller, Mr. D. B. Johnstone, and Mr. William Goodwin. Bronze medals: Messrs. Donald Dove, R. P. Rutherfurd, D. R. Clark, Archibald Watson, R. F. Linn, James Cowper, J. C. Oliver, and J. W. Eadie. Mr. WILLIAM GOODWIN gave a demonstration of the manufacture of gelatine dry plates, showing how the emulsion is made and the plates are coated.

Kilmarnock and Ayrshire Photographic Society.—The President (Mr. J. Mack Wilson Seabank), Preswich, in the chair.—Mr. A. C. BALDWIN, the representative of the Eastman Company, London, the makers of the famous Kodak camera, Solio paper, &c, gave a most eloquent and interesting description of the various articles manufactured by the Company. At the close he developed with amidol a large number of photographs done on bromide, nikko, and platino-bromide papers. The following were admitted members of the Society:—Mrs. Arthur, Mount Charles, Ayr; Miss Edith M. L. McKerrow, Content House, Ayr; Miss Mary Stewart, Heathfield, Irvine; Mr. James Curlet, Holmhead House, Kilbirnie; Mr. Matt Robertson, Portland-road, Kilmarnock; Mr. J. Mackenzie Stewart, Heathfield, Irvine; Mr. L. Patterson, photographer, Irvine.

Photographic Society of Ireland.—January 11, Dr. Scott (President) in the chair, which was subsequently taken by Mr. A. Werner (Vice-President).—The subject was entitled, *The Lens: its Varieties, its Functions, its Defects*, by J. H. Hayman and J. A. C. Ruthven; *The Goerz and Zeiss System*, by Dr. Scott. As Mr. Hayman was unavoidably absent, Mr. RUTHVEN opened the proceedings by treating the subject in such a clear and concise manner that it must have been thoroughly understood by the veriest tyro present. After explaining refraction, he went on to describe the prism, and its connexion with the lens, the reversal of the image in the camera, and many points of interest bearing on the subject. Dr. SCOTT then delivered his address on the "Goerz and Zeiss System," and which was exhaustive in the extreme. He showed, by comparison with some English lenses of the crown and flint type, the absence of astigmatism in the Goerz and Zeiss form—notably in the former—and illustrated by diagrams, as well as by practical demonstration, the defect in lenses. A few slides from negatives taken during the Convention week were shown at the conclusion of the meeting.

Photographic Society of Japan.—An ordinary meeting of the above-mentioned Society was held at the rooms of the Geographical Society (Chigaku-Kyokai), December 13, Mr. C. D. West, M.A., in the chair.—Mr. K. Arito had sent from London a print showing the result of developing and toning Solio paper after a short exposure only had been given. The pictures were clear in the whites, showed a full gradation, and were of a particularly pleasing colour. A print sent by the American Aristo Paper Company, on paper called by the name of Aristo-platino paper, was shown. The surface of the paper was matt, and, although the toning had been with gold, the tint was, as nearly as possible, that of a platinotype. The CHAIRMAN then called on Messrs. W. K. BURTON and T. KONDO to demonstrate the kalitype process. The demonstrators stated that they considered this process to have certain advantages over any other. They would not compare its general merits with those of the platinotype process, which latter they considered the first of all processes, but it—the kalitype process—had certain advantages of its own. It was cheap, was very easily worked, and was the only process they knew giving a visible image that would give a true black print from a thin negative, and that seemed suitable to almost any kind of paper. The process depends on the fact that ferric oxalate is sensitive to light, being changed thereby into ferrous oxalate, which latter salt has the power of reducing various metallic salts, nitrate of silver among the number. The process is a very old one, but that worked by the demonstrators was a modification of a recent form thereof, introduced by Mr. O. P. Bennett. The following is a description of the process:—Sensitising solution: Ferric oxalate, 75 grains; silver nitrate, 30 grains; water, 1 ounce. This solution is swabbed over the paper with a wad of cotton-wool. The coating is, of course, made as even as possible, but streakiness that cannot be avoided does not, as a rule, show in the finished print. The paper is dried in front of a clear fire before the solution has time to sink into it. Paper so prepared will keep for several days in any ordinary wrapping, for months in a calcium tube. The quantity mentioned is enough to coat about ten square feet of smooth paper, five feet of extra rough drawing paper. Printing is done in the ordinary printing frames, the time taken being about one-third of that needed for albumenised paper. The image is visible, and has the exact appearance of the image in the platinotype process—in fact, it is of exactly the same nature—and any one accustomed to platinotype printing can readily judge when the paper should be taken from the frame. Developer: Rochelle salt, 1 ounce; saturated solution of borax, 10 ounces. Restrainer: A one per cent. solution of bichromate of potassium. The effect of the restrainer is very marked. Without any of it,

the prints are liable to be "muddy," and to have impure whites. The least that is needed is seven or eight minims to each ounce of solution, and no more than this should be used for negatives such as are suitable for printing with albumenised paper or such as are at all hard. In printing from thin negatives, restrainer up to the extent of thirty minims per ounce may be used, the exposure being correspondingly increased. In this way it is possible to get brilliant prints from negatives too thin to give such by any other process. The image develops from a pale yellow colour to a full, deep, black in a few seconds; but, if the print be at once removed from the solution, it will be found that the high lights are yellow. It must remain in the solution for at least a quarter of an hour. It is to be observed that no further actual developing action takes place during this time. Though the developer can be altered to suit different negatives, or even, to a certain extent, to compensate for error in exposure, the result cannot be modified in any way when once the print is in the developer. In using smooth paper, a number of prints may be developed in the same solution, pouring the developer into a measuring glass as soon as one print is developed, placing an undeveloped print on the top of this latter, and returning the developing solution, the prints being afterwards kept moving just as in the ordinary toning process. In using very rough paper, however, this procedure is not permissible, as the image gets rubbed from the tops of the rugosities of the paper, with the result of a mottled effect. After development the prints are washed in three or four changes of water, and are then placed in the fixing bath consisting of one per cent. mixture of strongest ammonia and water, where they remain for about a quarter of an hour. Washing for half an hour completes the process. A number of samples of work on different kinds of paper were shown, some being on common cartridge paper.

FORTHCOMING EXHIBITIONS.

1895.

February 6–8 ..... *Bournemouth Photographic Society. Hon. Secretary, E. Greenleaves, Priory Mansions, Bath-road, Bournemouth.

March 25–30 ..... *Brixton and Clapham Camera Club. F. W. Levett, 11, Corrance-road, Brixton, S.W.

* Signifies that there are Open Classes.

News and Notes.

Messrs. O. Siĉhel & Co., of 47, Oxford-street, announce a stock-taking sale of backgrounds, frames, &c.

The Gem Dry Plate Company, of Villiers-road, Willesden Green, is a new dry-plate Company, with which Mr. T. E. H. Bullen is associated.

Messrs. J. Theobald & Co., 19, Farringdon-road, write: "It may interest your readers that in our next auction sale, to be held Tuesday, February 12, we are offering for sale, by order of an Edinburgh house, a Dallmeyer lens, rapid rectilinear, 30×24, catalogue price of which is 77*l.* It is very seldom that such a lens can be procured, and we think it will be likely to draw a good many people to the sale."

Leicester and Leicestershire Photographic Society.—An Exhibition of photographs will be held in the Co-operative Hall, High-street, on February 13 and 14, 1895. In addition to the members' work, the Council hope to secure examples from some of the leading photographers of the day. All communications respecting the Exhibition should be sent to the Hon. Exhibition Secretary, Mr. J. Porritt, 66, London-road, Leicester, where all exhibits should be delivered not later than February 4, 1895.

Conversazione.—The annual *conversazione* and dance of the *employées* and friends of Messrs. George Mason & Co. took place in the Queen's Rooms, Glasgow, on Wednesday evening, 23rd ult. Previous reunions of this old firm have always been enjoyable functions; this year quite eclipsed preceding ones. Each seemed to vie with the other in making matters go smoothly, consequently the company of over eighty, which included friends from cities as far apart as London and Aberdeen, spent a most delightful evening. During the evening songs were given by Mrs. Arthur, Mrs. Carmichael, Mrs. Muir, Mr. Cox, and Mr. Steel; Mr. Paton and Mr. Baldwin (Eastman Company) each gave a recitation.

Result of Lumière's Colour-value Competition. (Open to Lumière's or any English commercial plates.) Subjects: Cassell's Colour Diagram and a Chromolitograph, both supplied by Fuerst Brothers. Negatives only judged. The Judges (Captain W. de W. Abney, Messrs. C. H. Bothamley, and Andrew Pringle) have made the following awards:—First Prize, 25*l.*, awarded to competitor No. 203, Mr. Lewis P. Muirhead (amateur photographer), Dalglenan, Helensburgh, Scotland. Plates obtained through Riddell & Rae, Glasgow. Negatives on Lumière's panchromatic plate (sensitive to yellow, green, and red). Lunière's yellow screen used. Prints on Lumière's Citos paper. Exposure for chromo, two hours, by lamplight; exposure for colour diagram, one hour and a half, by lamplight. Second Prize, 15*l.*, awarded to competitor No. 133, Mr. F. W. Edwards (fine art photographer), 87, Bellenden-road, Peckham Rye, London, S.E. Plates obtained at Parke's Drug Stores, Limited, Peckham Branch, S.E. Negatives on Lumière's panchromatic plates, for the chromo; Lumière's "A" series orthochromatic plate (sensitive to yellow and green), for the colour diagram. Time of exposure not stated. Orange screen used. Third Prize, 5*l.*, awarded to competitor No. 224, Mr. Walter Ridler, 10, Upper Dorrington-terrace, Stroud, Gloucester. Dealer, S. J. Coley, Stroud. Negatives on Ilford isochromatic plates. Chromo copied in room window with orange paper; exposure, nine hours. Colour diagram copied by lamplight; exposure, one hour. The following are highly commended:—Competitor No. 227, Mr. Leon Warnerke, "Silverhowe," Champion-hill, London. Negatives on Lumière's panchromatic plates by monochromatic light. Competitors No. 163, Messrs. Gray & Davies, 92, Queen's-road, Bayswater, W. Negatives on Lumière's panchromatic plates. Yellow glass screen used. The number of entries, negatives, and prints received from all parts of the United Kingdon exceeded 300, and it is now clearly determined that the use of orthochromatic plates for rendering correct colour values is absolutely necessary, and that to obtain the best results suitable screens must be used. The subjects of the Competition were admitted on all sides to be extremely difficult; and, at the same time, a useful purpose has been served by the colour diagram to obtain standard colour values of all the various colours. We may here state that Captain Abney has determined, by photometric measurements, the colours of the Competition diagram relative to the actual quantity of light reflected, and the following is the order of their respective brightness: 1, yellow; 2, blue; 2½, violet; 3, green; 4, orange; 5, red; 6, orange-red; 7, citrine; 8, sage; 9, slate; 10, russet; 11, plum. "The prize pictures will be on exhibition at our address to all those who are interested, and we hope shortly to make arrangements for reproducing the originals and the results obtained with the negatives. Fuerst Brothers, 17, Philpot-lane, London, E.C."

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

DEVELOPING GELATINO-CHLORIDE PRINTS.

To the Editor.

Sir,—Two of your recent correspondents have recommended the use of a neutral solution of pyrogallol, or one slightly acidified with citric acid, for the development of partially printed chloride papers.

It occurred to me that metol is much cleaner and more rapid in its action than pyro, and with this view I have experimented. Using about three-quarters to one grain of metol to each ounce of water, and adding a few drops of a nearly saturated solution of citric acid, I succeeded in developing prints exposed for a minute or two at four p.m., and I send for your examination some of my first trials.

When sufficiently developed, the prints are thrown into a two per cent. potasssium bromide solution, washed, and, if desired, toned. The samples sent are merely fixed, and, with regard to the exposure necessary, some of them (marked) were given ten minutes at six inches from a Welsbach incandescent gaslight.

It appears to me that prints by this process would give good blacks, sepias, and greys. It is susceptible of many variations, and will keep me busy experimenting for some time.—I am, yours, &c.,

A. C. Harris.

11, *Belle Vue-terrace, Penarth, Glamorganshire, January* 28, 1895.

COPYING BY ARTIFICIAL LIGHT.

To the Editor.

Sir,—The copying of photographs by many photographers that I have met with is looked upon as being more of a nuisance than anything else, and yet, if properly attended to, it brings the satisfaction of a large order, and, in many cases, an enlargement.

The cause of dissatisfaction, I fancy, often arises from the fact that so many workers are compelled to use the same instruments for their ordinary portrait work as they do for copying, with this result, that, just as the operator has got the camera "rigged" up, and perhaps one imperfect exposure made, a sitter is announced, and down comes the whole arrangement, and, no doubt, sometimes the imperfect negative is finished.

Having accumulated a number of "copies" recently, I determined to try some artificial lighting, and my first trials were made with the magnesium ribbon. With this I succeeded fairly well, but was soon nearly choked with smoke.

Considering the ribbon a failure from the cause mentioned, I next secured one of the now popular "incandescent gas" burners, and, having a small bracket attached to the front of my studio camera, which could be connected by a rubber tube to the ordinary gas bracket in the studio, I arranged the position of the burner on camera, so that it was as near as possible to the hood of lens (without, of course, coming in front) so as to throw a front light on the subject to be copied.

The results with this arrangement have been most satisfactory, and now, after the ordinary day's work is done, I can copy to my heart's content, and what before I could scarcely find time and opportunity to do is turned into an evening's pleasure.

For ordinary work I use a Dallmeyer's 3B, with a medium stop, and the exposure varies from thirty seconds to three or four minutes, according to the depth and colour of the subject.

When camera is arranged for enlarging from *carte-de-visite* to cabinet, the distance of light is about twelve to fifteen inches.

My only excuse for venturing to occupy your valuable space is a desire to be useful to fellow-workers.—I am, yours, &c., JOHN WICKRAS.

Upper Bangor, January 23, 1895.

THE PROGRESS MEDAL.

To the EDITOR.

SIR,—"A Wondering Photographer" makes a statement which needs the verification of the Council of the Royal Photographic Society before it can be accepted as a fact.

In awarding the progress medal to Dr. Emerson there can be little doubt that the Society had good and sufficient reasons for so doing. Unquestionably Dr. Emerson did make progress when, with the courage of an honest man, he withdrew his book and renounced doctrines which he found to be "unsound and untenable," but no intelligent person could suppose that it was for this negative kind of progress that the Society awarded him a medal.

Perhaps it will be found that Dr. Emerson has written another book, and illustrated it with other kind of photographic work to that of his earlier studies; at all events, it would have been as well to hear what the Society has to say about the matter before charging them with ignorance and incapacity. Whatever Dr. Emerson may be as a photographer, at the present time there can be no doubt that he is a very talented and conscientious man, and therefore entitled to respect.

There should be as much sound judgment and common sense in the combined intelligence of the Council of the leading Photographic Society in the world as that for which a wondering photographer gives himself credit. I don't see how there could be less.—I am, yours, &c.,

A NON-ADMIRER OF DR. EMERSON'S NATURALISTIC PHOTOGRAPHY.

"F. R. P. S."

To the EDITOR.

SIR,—I was very much interested in a paper by Mr. W. H. Harrison, entitled *Some Forgotten Pages of Photographic History*, printed in your last issue, and only regret that its author should go very much out of his way, and, to judge by his inaccuracies, very much out of his sphere, to depreciate the title which the Council of the Royal Photographic Society have at last proposed to grant to proficients in photography. He discounted, unintentionally it is evident, the force of his criticisms, by comparing the title F.I.C., which he admits to be a genuine guarantee of proficiency, with that of F.R.P.S.; because, had he acquainted himself with the constitution of the two bodies of Fellows, as set forth in the rules of the Institution referred to, he could hardly fail to observe that the Royal Photographic Society have evidently based their regulation upon that of the Institute of Chemistry, with the very name of which Mr. Harrison does not appear familiar.

Of course, I cannot say whether or no the R.P.S. will be as stringent as the Institute. As far as I am aware, there is, as yet, no one entitled to use the letters F.R.P.S., so that outsiders like Mr. Harrison and myself cannot appraise their value; but, until it is seen that the Council grant fellowships to any one who is willing to pay the subscription, it is absurd to condemn them in advance for doing so. As far as the admission of existing members is concerned, Mr. Harrison can hardly object to their action, since it is precisely on the same line as that adopted by the Institute of Chemistry at its inception. Was Mr. Harrison aware of this?—I am, yours, &c.,

OUTSIDER.

THE COUNCIL ELECTION OF THE ROYAL PHOTOGRAPHIC SOCIETY.

To the EDITOR.

SIR,—The hint given by "Cosmos," in your last issue, is well timed and necessary. The whole welfare of the Royal Photographic Society is in the hands of the Council for the time being, and with the Council to be elected at the annual meeting will rest the question of taking full benefit of the advantages recently acquired by the Society. Therefore, the members to be elected must be men *practically* interested in the welfare of photography, and also be in a position to attend every meeting of the Council; ornamental absentees would only keep out more useful members. If the affairs of the Royal Photographic Society *are* of any interest to the members generally (which, from the attendance at the meetings, seems somewhat doubtful), it is necessary that they must vote at this Council Election, and vote only for those members whom they think will *work* on the Council, and so make the Royal Photographic Society a really useful institution, to which in the future the Fellows and Members may well feel proud to belong.—I am, yours, &c., WILLIAM E. GRAY.

92, *Queen's-road, Bayswater, W., January* 28, 1895.

QUOTATIONS.

To the EDITOR.

SIR,—In your last, "Prose" complains of the too frequent repetition of the quotation of Wordsworth's venerable couplet about "that confounded yellow primrose," also that it is sometimes misquoted. But that is not the worst. The scientific spirit of the age has got (for American readers I would say gotten) hold of the lines and made them almost as difficult to read as a paper on developers by a three months old photographer, or to understand as a definition of "progress" by a one month's old Society, or, indeed, to conceive of the amount of dignity conferred for an extra guinea by liberty to use the letters F.R.P.S. This is the latest scientific development of the simple words—

"Primroses by the river's brim
Dicotyledons were to him."

Surely such words are much more grateful and comforting to the mind that rejoices in much of our modern chemical nomenclature than the primitive "yellow primrose" of the past.—I am, yours, &c., H.P.R.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Exchange very strong tripod, nine-inch top, with two quires best albumenised paper, for studio table.—Address, RUDD & Co., 5, Castle-street, Dudley.

Will exchange Cadet's studio flap shutter for old-pattern, solid body, wet-plate camera. Address, A. Jewell, 60, Aliwal-road, Clapham Junction.

Will exchange the *Photogram* for 1894, without supplements, for good focussing magnifier. Address, G. H. STANLEY, South-gate Studio, Chichester.

Will exchange 12×10 J. H. Dallmeyer's wide angle as new for rapid rectilinear for whole-plates of equal make.—Address, HAWKINS, Shrublands, Halstead.

Will exchange head-and-body rest (nearly new) for background, 8×8, to value or make up with cash.—Address, W. J. BENNETTS, Bennetts', Beacon, Camborne.

Want burnisher or embossing press in exchange for Lancaster's half-plate instantaneous lens and shutter.—Address, G. W. Bashford, 104, Field-road, Forest Gate.

Klarey box of colours and two interior backgrounds, new, for a set of four Victoria lenses and camera.—Address, F. W. BROADHEAD, The Studio, New Walk, Leicester.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Joseph L. Hopper, Nelson.—*One photograph of North-east Lancashire polo team.*

Walter S. Dexter, King's Lynn.—*Photograph of Jacobin Pigeon, "Black Emperor."*

Thornton-Pickard Manufacturing Company, Altrincham.—*One catalogue of Thornton-Pickard specialities.*

Peter Charleton, Newbridge, co. Kildare.—*One photograph each of Rifle scroll and Coldstream Guards' scroll.*

Robert Charles Whitehouse, Manchester.—*One photograph each of John Henry Syers and John Henry Darbyshire.*

F. Snary, Bristol.—*One photograph each of Great Western Railway broad-gauge locomotives "Achilles," "Inkerman," and "Amazon."*

Edwin Debenham, York.—*One photograph of oil painting, representing the presentation of the freedom of the city of York to H.R.H. the Duke of York. Also a photograph of John Dent-Dent.*

J. J.—By soaking the prints in hot instead of cold water, they will come away readily from the mounts.

FRANK MELTON.—The coloured fringes on the screen arise from the condensers being rather too small in diameter.

BERT.—Coraline may be obtained from Mawson & Swan, Hopkin & Williams, and doubtless numerous other chemists.

BROMIDE.—Sulphantimoniate of sodium is more popularly known as "Schlippe's salt." Your local druggists will probably know it by the latter name.

T. BEDWELL.—The photographs of Mr. Gambier Bolton's animals are printed by the carbon process; at least, all we have seen have been by that process. They are published by the Autotype Company.

J. S.—Thirty air-bells in a lens may not have the effect of making it work much slower, provided they are only small, but they may have a detrimental effect if you ever decide upon selling the lens.

MONMOUTHSHIRE.—Yes, you can recover in a London County Court, but under the circumstances, by communicating the facts to the local Superintendent of Police, you may get your money back more expeditiously.

TORQUAY.—A table of enlargements will be found on page 944 of the ALMANAC. That gives the distance for any degree of enlargement, with any focus lens, as well as the distance the negative to be enlarged must be from the lens.

S. WEISS.—The ALMANAC for 1887 has long been sold out. It is not possible to make a pair of 5 × 4 pictures coalesce with the Brewster stereoscope. You will get some good sound information from W. I. Chadwick's *Treatise on the Stereoscope*.

T. BLISSARD.—It is quite possible that the spots proceed from the cause referred to in another column, namely, floating particles. Indeed, it is more than probable that they do, because in some of the spots a distinct nucleus can be detected.

PERPLEXED.—If the prints were supplied to the order of the paper, and on the publisher's printed form, signed by the manager, to the firm you must look for payment. The manager having left makes no difference so far as the debt is concerned.

CISTEREION.—1. It would be better to coat the metal part of the frames with the same material as the tank itself is coated with. 2. The method of washing appears to be good, but we prefer manipulating the prints by hand in many changes of water. 3. Two hours ought to be sufficient.

B. SYMONDS.—It is only from transparent celluloid that a clear and colourless solution can be obtained. The other kinds usually contain a considerable quantity of pigment, and other foreign matters, that are insoluble in alcohol or amyl-acetate. With the transparent films, used for photography, the gelatine must, of course, be removed before the solution is attempted.

A. W. W.—Details of the working of processes cannot be given, in the limited space of this column, so as to be of any real value to beginners. The process is described in the ALMANAC for 1893, and in Burton's work on *Photo-printing Processes* (Marion & Co.). Zinc plates suitable for the work are supplied by most of the houses who supply printers with their materials: Winstone's, for example, in Shoe-lane.

J. HACKETT.—Unless the ship were a considerable way off, you certainly would see only a small portion of it with your telescope. But if you only see a single mast or a bit of the rigging, and focus sharply with the telescope, you can make certain of such portion being in the centre of the plate and the greatest sharpness of negative being obtained. The foci of telescope object-glass and of photographic lens must be as nearly identical as possible.

J. E. EDDISON.—The cause of the stains is imperfect fixation. It does not appear to be universally known that in cold weather the hypo fixing solution loses much of its fixing power, whereas, in warm weather, it will fix quite well. When operating in a low temperature the hyposulphite of silver is not always dissolved out of the print, and when this is the case it invariably makes its presence known in the form of a brown or yellow stain soon after the print is washed.

S. & CO.—The only way out of your difficulty is to use a pyroxyline that gives a tougher and more horny film than that you have tried, such as that made at a lower temperature. It is quite possible, if you employ a pyroxyline of that character, that it will not give a satisfactory emulsion from a photographic point of view. If you do not make your own pyroxyline, we should advise you to get a number of samples from different sources, and see if you can find one that answers your requirements in both directions.

FRITZ SCHMIDT.—It is quite illegal, in this country, to sell bromide photographs as platinotypes. If they are sold to dealers as platinotypes, and they, again, sell them as such, they also bring themselves within the pale of the law. They can, however, proceed against the vendor, to them, under the fraudulent trades description law. The print enclosed is a very good imitation of a platinum print, but a very slight treatment with a solution of bichloride of mercury at once revealed its spuriousness. If an attempt is made amongst London printsellers to foist bromides upon them as platinotypes, they will not be slow in setting the law in motion.

THIN SPACE.—1. We should recommend you to use a slow plate for the negatives, but it is impossible for us to give you any definite information as to the time of exposure required. The exposure of a couple of trial plates will give you a better idea than any instructions from us. 2. Develop with pyro-soda. The following will be found a good formula for the purpose:—Pyro, 2 grains; sodium carbonate, 12 grains; potassium bromide, 1 grain; sodium sulphite, 24 grains. 3. As to the lantern slides, you must suit the developer to the exposure given and the tone required. See the formulæ pages of the ALMANAC, where much useful information is given.

CONFIDENT.—If you doubt what has been said in this and other papers on the free-portrait scheme at home and abroad, send a portrait of yourself, and let us know the result. It will only cost you the portrait and the postage; so you cannot lose much, at least at the initial stage.

R. O. S.—Your case is a hard one, but it is no worse than that of scores of other apprentices and articled pupils who have paid substantial premiums and worked for three or more years for a nominal salary. As you admit you are not a proficient operator, through not being properly instructed in studio work, you cannot expect more than a very small salary, particularly as the market is already over-stocked with thoroughly proficient workers in every branch. We cannot advise you to go to the colonies, as there the photographic labour market is as over-stocked as it is here, and the work produced is of quite as high a standard as it is in England.

MILTON B. PUNNETT (M. A. Seed Company, St. Louis).—1. While we are strongly of opinion that the Newall Sensitometer is an excellent one, we are not aware of its being much, if at all, employed by plate manufacturers, who, however, do not usually divulge their methods. It is quite possible that some may have been deterred from using it on account of the mechanism involved in its construction. Mr. Newall patented his sensitometer in September 12, 1888, No. 13,149. A full description of it appeared in our JOURNAL for March 1, 1889. 2. The articles by Mr. Herbert Starnes, to which allusion was made, are doubtless a series of four which appeared in this JOURNAL in 1889, commencing April 19 of that year.

PYRO asks: "1. The names of respectable insurance companies that have reduced premiums for fire insurance on studios since dry plates came into use. 2. Is there any trade journal in connexion with the frame-making business where I could get addresses of dealers (wholesale) in mouldings and frames? 3. By what means can I find out if a certain photograph is copyright, as I have an order for enlargement from a photograph, and I am not sure but it may be copyright, and would not wish to infringe?"—Perhaps some correspondent will reply to the two first queries. As regards the last, search may be made at Stationers' Hall, but it will prove an herculean task. Better get a letter of indemnity from the person giving the order.

S. R. C. says he keeps a saturated solution of sulphate of iron and another of oxalate of potash in stock, but of late they do not seem to bring out the enlargements so well as they ought, although they are mixed in the usual proportions. The image, he says, is slow in making its appearance, and has but little vigour when fixed. The solutions are always, he adds, warmed up to 60°, so it is not due to cold. It is, however. The cold has caused some of the salts, which were in solution when the temperature was higher, to crystallise out, and thus the solutions are rendered weaker. Use less water for diluting the iron and oxalate solutions for use. "Saturated solutions" are an indefinite strength. The proportion of salt held in solution is dependent upon temperature.

A. B. C. (Exeter) writes: "Would you kindly give me a receipt for mixing the paint for 'distemper' backgrounds; also what canvas and brushes are best for same?"—Paint is not used for distemper backgrounds, but distemper colour; that is, simply common colour mixed with water and sufficient size of the oilshops to fix it to the canvas. Common whiting, lampblack, Venetian red, &c., are the colours generally used, and they are blended to the tint desired. The size must, of course, be added hot, but the distemper should not be used until it is cold and in a jellied condition. The distemper, if the surface to be coated is large, is usually applied with an ordinary whitewash brush. If scenic effects are desired, common sash tools are used. Cheap, unbleached sheeting answers well as the fabric.

V. W. says: "A lot of my customers, during the last few days, have been receiving circulars from the 'Tanquerey Artists' Society.' You referred to this in your JOURNAL of January 18, but you did not say *how* the Society managed to best the public. I should feel very much obliged to you if you could furnish me with particulars of their mode of dealing; I am sure it would be of great interest to all your readers, and would enable photographers to warn their customers. As it is, I have warned people, but they take very little notice, and say, 'Oh, I think I shall send them a photograph, one which I do not value much?' They *will* try their luck, and as I cannot tell them *where* the fraud lies, they think it is to my interest to prevent them sending to Paris."—In reply: The mode of operation is as follows: When the Company obtains possession of a photograph, the sender is informed that a beautiful enlargement of it has been made, with which he will be presented; but he will be expected to purchase the frame at a cost ranging from two to five guineas. As the enlargement (if actually executed) only costs a shilling or two, and the frame about the same amount, you will see that a large margin exists for making the game a lucrative one.

CONTENTS.

	Page
ARTIFICIAL LIGHT PORTRAITURE ..	65
DEVELOPMENT OF PARTIALLY PRINTED PROOFS	66
THE AMOUNT OF SILVER IN SOLARISED ALBUMEN PAPER. By A. HADDON AND F. B. GRUNDY	68
ALIEN SKIES. By HECTOR MACLEAN	69
THE INFLUENCE OF ORTHOCHROMATIC PLATES AND YELLOW SCREENS ON COLOUR VALUES. By J. H. BALDOCK, F.C.S.....	70
THE PHOTOGRAPHIC NATURALIST. By J. VINCENT ELSDEN	71
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—II. By T. N. ARMSTRONG	72
PLATINUM TONING OF ILFORD MATT P.O.P.	73
THE NEW EASTMAN KODET	73
OUR EDITORIAL TABLE	73
RECENT PATENTS	74
MEETINGS OF SOCIETIES	75
FORTHCOMING EXHIBITIONS.....	78
NEWS AND NOTES	78
CORRESPONDENCE	78
EXCHANGE COLUMN	79
ANSWERS TO CORRESPONDENTS.....	79

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ACHROMATIC *VERSUS* SPECTACLE LENSES.

We invariably find that, soon after the advent of a new year, photographic amateurs begin to see to their appliances, so as to have them in a state of perfect readiness for use when the weather proves favourable.

Respecting one important appliance—the lens—it is long since we have had so numerous a congeries of queries put respecting it as we have since the dawn of the present year, and, singularly enough, a large proportion of these have reference to the application of simple or uncorrected lenses to the production of photographs. Many of them, too, abound in misconceptions, arising perhaps from what may have appeared in foreign journals. In this brief article we shall endeavour to set right those who may have been misled by the Will-o'-the-Wisp—cheapness.

It is altogether a pernicious error to suppose that, as we read in a popular article in a non-photographic journal last week, as good a picture can be taken by means of a cheap spectacle glass as by a costly achromatic lens. Undoubtedly a picture of a sort can be obtained by such a glass, and even without it, if the front of the camera is punctured by a pinhole, and "fuzzytypes" of this nature have even found admirers amongst some well-meaning enthusiasts of the impressionist school.

We can, however, readily conceive of young men desirous of having a practical acquaintance with photography, yet whose financial means unfortunately will not permit of their purchasing properly achromatised lenses, low priced as some of these now are. To them the spectacle glass comes as the friend in need, and it is for the benefit of such as these this article is written.

In making purchase of a simple lens of this nature the first noticeable thing is that there is no difference in price between one of, say, six or seven inches focus, for covering a quarter-plate, and one of twenty or thirty inches focus for plates twelve or eighteen inches. Nay, unlike achromatic lenses, those of very short focus are occasionally charged a trifle higher. The last purchase we made was one each, of the respective foci of ten, seventy-five, and one hundred inches; and there was no difference in their prices. The kind of glasses to be selected should be those known as meniscus or periscopic, and not double convex.

For ordinary landscapes one such lens only need be used, and it must be mounted convex side next the ground glass, and a diaphragm placed outside. No rule can be readily given for determining the distance between lens and diaphragm, but it may be approximately ascertained by having such a degree of separation between them as to allow of the corners of the plate being illuminated, and not much more. It will be found that to obtain a flat field a somewhat smaller stop will be required than if the lens were achromatised. In covering a 10×8 plate with a simple lens of sixteen inches focus, we found that it required a stop of rather less than half an inch aperture, equalling f-36 approximately. Even with this, the marginal definition was visually inferior to that obtained with an achromatised lens. It would have been improved had the stop been removed to a greater distance, but this the small diameter of the spectacle glass would not admit of being done on a plate of such dimensions.

A space of half an inch was now marked off on the camera base, and the ground glass was brought nearer the lens by this distance, for, as is now well known by nearly every one, it is the actinic, and not merely the visual, rays of light by which the image is impressed on the plate, and these come to a focus about a thirtieth nearer the lens than do the more luminous rays. Now, here will be noticed some differences between the spectacle glass and the achromatic lens. Equal sharpness is theoretically impossible, for, whereas an achromatised lens brings all the rays to a focus on one plane, and thus has them concentrated at one spot, with the other, when the violet ray—the most active of the spectrum—is focussed sharply, the green, yellow, and orange rays, which all possess some, although diminished, power, are considerably out of focus, and thus surround the points of impact with faint halos. It is not now as it was long ago, or previous to the formation of our sensitive surfaces by bromine, which is much more sensitive to colour radiations than iodine.

It will perhaps be suggested that the trouble of making a special adjustment for the chemical and visual foci may be avoided by having the ground-glass frame so made as to have the focussing screen on a plane half an inch farther back than the plane against which the sensitive plate is to rest. This was actually done in early times, when achromatic lenses were less plentiful and much more costly than is now the case; but this is only effective when the focus is adjusted for objects at one definite distance. In proportion as the anterior object approaches to the lens, so, by the operation of the law of conjugate foci, does the focus of the lens become lengthened, until an object is so near that the image is the size of the original, when the focus of the quondam sixteen-inch lens becomes thirty-two inches, causing now a difference of over an inch, instead of half an inch, between visual and chemical foci.

Without indulging in farther reasoning on this subject, we advise that the photographic employment of spectacle glasses as lenses be confined to cameras of small dimensions and of short focus, that the ground glass be entirely eliminated, and that the focussing be done by means of scales of distances determined by previous actual trial. In this way only can such lenses be utilised without causing more or less trouble to the users.

Two simple lenses may be mounted together in the manner of a rapid, or even a slow, rectilinear. The advantage of mounting them in this way will be found in their producing architectural or similar photographs in which there will be absolutely no curvilinear distortion.

COMPOSITE PHOTOGRAPHS.

A FEW weeks back, it will be remembered, a method was described by which two or more group negatives, imperfect in themselves, could be combined into one perfect whole by taking out the defective figures in the one and replacing them by the more perfect ones in the other, or others, as the case might be. It is not a little surprising that advantage is not more frequently taken of making combination group pictures than is now done by professional photographers—not necessarily of events in which all the figures included were present at one and the same time.

Just now are to be seen, in the windows of some of the leading London printsellers, some very fine photogravures of Henley at regatta time, also of Ascot on the Cup Day. The photogravures are from paintings, and, pictorially, there is nothing extraordinary in them. The interesting point in connexion with the pictures is in the persons depicted, of whom there are scores. Their portraits are all excellent and delicately finished, and to get them in such perfection special sittings must have been obtained. Now, it is not to be assumed that the whole of these persons were on the spot at one and the same time, or that they ever occupied the positions or the attitudes in which they are represented. Nevertheless, the pictures possess interest to the *habitués* of Henley during the boating season, and Ascot at race time. The interest, however, in these and similar pictures, extends to thousands of persons who take an interest in boating and sporting matters, and we are informed the particular pictures referred to are meeting with a ready sale, notwithstanding the high prices at which they are published. Of course it is only on such subjects as these, in which the *élite* of society are depicted, that the great cost of getting up the originals would prove a commercial success.

Photography pure and simple is, however, capable of yielding pictures of the above type, that would prove very remunerative if they were produced with judgment, and it is, as we have just intimated, somewhat astonishing that the subject is so much neglected by the profession. We are quite aware that some very good composite pictures of this character have been produced, photographically, of medical, scientific, and sporting celebrities. The method adopted has been this: A background, with foreground, is painted on a large canvas in monochrome of some general *rendezvous*, such as, say, an extrance hall, a meeting room, or an out-door scene associated with the body. On the painted canvas the portraits, paper prints, are mounted, being arranged in position according to the judgment of the artist, he always aiming at getting the most prominent members in the foreground as much as possible, when the attitudes and size of the figures will permit. When the picture is completed negatives are taken of it of the size desired.

Such pictures, when published, have, in most instances, we believe, met with a good sale; but frequently, in fact more often than not, they are very incongruous, as, for example, some of the portraits being lighted from one direction, and others from an entirely opposite one. That has been due to the fact that sittings were not obtained specially for the picture, hence it had to be compiled of such portraits as could be procured, and often these have been in various stages of decay. It will be fully realised that the getting up of such pictures as these, containing a hundred or two portraits, is no easy matter to do satisfactorily when the portraits are not taken specially for the purpose.

There are, however, many local events that photographers might, if they chose, turn to profitable account in the direction of composite work—say, for example, municipal bodies, county councils, &c. In these cases special sittings could, doubtless, be obtained by most photographers of standing in the respective districts—then the work would be quite easy. The procedure might be this. First take a photograph of, say, the interior of the council chamber or municipal hall, and from it make a good-sized enlargement on bromide paper, and mount it on a stretcher, or stout board. Then portraits of the councillors are taken in the studio in suitable positions and lighting, and of a size to accord with the general picture. The portraits, on paper, are then mounted on the enlargement in the positions, or seats, usually occupied by the individuals. That done, negatives are taken of the picture of the size required. It will now be seen that the production of a composite picture under these conditions involves but little trouble, and is sure, if good, to prove remunerative, as well as be an excellent advertisement. But it will also generally prove remunerative in another way, for, if the individual portraits when taken are good, copies are generally ordered by the sitter for private use.

We have now before us a 15 × 12 photograph, taken some time ago, of a ceremony, evidently the laying of a foundation stone, in which, to judge by the robes, insignia, dresses, &c., the principal local magnates and the *élite* of the neighbourhood must have been present. But, unfortunately, many of the most important of the functionaries, including the principal one, moved during the exposure, consequently the picture was rendered of no interest. Yet it might have been turned to profitable account by getting sittings, in the studio, from those who had moved in the group, and substituting these portraits for the defective ones in the original by the method described a short time ago. In this way a picture of apparently great local interest, judging by the great number of persons in it and their costumes, that could not possibly be taken again, and which as it was could be of no commercial value, might have been made into a very remunerative one.

DEVELOPMENT OF PARTIALLY PRINTED PROOFS.

AMIDOL behaves so well as a developer for bromide prints that many, accustomed to its use for that purpose, will, no doubt, prefer to adhere to it for this, more especially as there will be economy in the employment of one developer only instead of two or more, as the amidol solution that has done duty for bromide work may, by the addition of the requisite quantity of bromide to a little alkali, be utilised for the development of

partially printed chloride proofs. It is, however, scarcely worth while preserving the used developer for the second purpose, owing to the inferior keeping properties of amidol in solution; but, if the two kinds of prints have to be treated within a short period of one another, the solution will retain its powers sufficiently to serve both purposes.

Where this is the case, it is well to keep at hand a strong solution of bromide of potassium in combination with carbonate of potash, for addition to the already-used developer. With regard to the employment of alkali, it may be said that, although under ordinary circumstances the addition to an amidol developer is unnecessary, unless from under-exposure more than ordinary energy is required, in the presence of the large proportion of restraining bromide it is needful to use, the action of the amidol being extremely slow and imperfect without the assistance the alkali gives, for which reason its use is recommended. The following solution may therefore be kept for addition to the used developer in the proportion of one drachm to each ounce.

Bromide of potassium	1 ounce.
Carbonate of potash	120 grains.
Water	4 ounces.

If after this addition the developer appears to work too slowly, or especially if it fail to give vigorous results, it will be evident that the amidol has lost its power, in which case there will be nothing for it but to add a little more dry amidol, or to change the solution for a fresh one.

In using amidol, however, it is better to make the solution up fresh in the following proportions; or the other ingredients may be kept in solution, and the requisite quantity of amidol added at the time of use:—

Amidol	3 grains.
Sulphite of soda.....	30 ,,
Bromide of potassium	20 ,,
Carbonate of potash	3 ,,
Water.....	1 ounce.

Unl ike amidol, metol and glycin, as well as the mixed solution of metol and hydroquinone, which we have mentioned several times during the past few months, keep very well after use, either for negative or positive work, if corked up when done with; and it is well worth the trouble to so preserve these solutions for subsequent use on chloride prints, for which they are admirably suited. The same solution of bromide and alkali given above may be added in slightly l arger proportion than for amidol, say a drachm and a half to two drachms to each ounce of old developer, though it is difficult to fix any precise proportions, the progress of development being the best test. Hydroquinone alone does not keep so well.

The saving of these old solutions will be found especially useful when a considerable number of prints have to be developed, as a considerable volume of solution may be used at a minimum cost, and a number of prints developed at once and a vast amount of time saved, as compared with development in twos and threes in freshly made solution. The developing action is so gradual and regular that the prints may be treated in precisely the same manner as in toning, a number being placed in the dish at once and turned over one by one until the right depth is attained. Indeed, for the purpose of securing uniformity of depth and tone, this plan is far preferable to separate treatment, as, when several are treated simultaneously, not only are the depth and colour more easily comparable, but there is less likelihood of subsequent variations arising in their appearance. It does not follow, however, that, if the proofs are not all equally printed—though this should be the case as far as possible—uniformity cannot be attained in the same manner, or that the advantages of simultaneous toning will be lost. As we stated in our article last week, the latitude in development permits prints of different character to be brought to the same apparent depth, and the fact that a number have been subjected to the action of the solution at the same time argues more in favour of their being subsequently uniformly acted on by the toning and fixing baths than if they had been separately treated in a constantly varying solution.

On commencing to develop them, if there be a number of prints from the same negative, these should be taken and, as quickly as possible, immersed one after the other, without previous wetting, in a sufficient volume of the developer. Ten or a dozen proofs will not be too many to handle at once, as the development, especially at first, is very gradual; but the number should not be indefinitely increased, for fear of the individual prints adhering together, or not receiving uniform treatment. The first action of the solution would be to turn the image to a pale yellow colour, and apparently to entirely bleach out the finer details. The change of colour will differ according to the depth to which the printing has been carried, being apparently greater in inverse ratio to the length of exposure. This is owing to the incapacity to distinguish by the unaided eye the more delicate shades of pale yellow, which, for a time, become invisible, until reinforced by the action of the developer. This is apparent first of all in the shadows or more deeply printed portions of the picture, which begin to assume a brown shade, and gradually the half-tones and delicate details follow suit.

The colour of the image throughout, especially when hydroquinone is the developer, partakes almost entirely of this yellow tone, and is altogether distinct from the colour of a fully printed-out proof when washed and ready for toning, although with metol and amidol the reddish brown or purplish brown colour is often very marked. This prevalence of the yellow colour renders it at first very difficult to correctly judge when the prints are sufficiently developed, as, owing to the deceptive value of the colour, there is a strong tendency to undervalue the depth of the image, and very often a print that to the unexperienced eye appears barely strong enough turns out, when translated into black and white, to be much over-developed. Bearing this in mind, and with a little experience, however, it will not be at all difficult to hit the proper point to which to carry the action.

To render this more easy, we may here offer the following wrinkle, not only to aid in judging the correct depth, but also to watch the whole process of development. Those of our readers who may happen to be the possessors of a pair of blue spectacles will require no further aid, but those who are not so fortunately situated may supply the deficiency by providing themselves with a piece of pale blue glass through which to survey the progress of the developing. Viewed in this manner, the yellow image becomes transformed into one of a more or less black-and-white character, becomes visually greatly strengthened, and, in fact, bears an altogether more accurate relation to its final or toned appearance than it does without the assistance of the coloured glass. The latter should not be of too pronounced a colour, nor of the deep indigo tint, but rather of a pale ultramarine tint, or a bright sky blue, through which the finest details will be distinctly visible.

The depth to which the development is carried will depend very much upon the kind of tone required and the toning bath used. For pale grey, and light tones generally, the action should be stopped at a comparatively early stage, and correspondingly prolonged in proportion to the depth and richness of colour, whether black, purple, or brown, it is intended to aim at. Of course, the character of the negative will have some material influence on this, but, other things being equal, the rule prevails that light development suits similar tones, and *vice versâ*. We had intended dealing with the possibility of varying the gradation of the prints by modifying the development, of, in fact, producing hard or soft results from the same negative, but find it would be too wide a subject to treat in this article. Such a power undoubtedly exists, and we may return to that branch of the subject at some future date, meanwhile our experimentally inclined readers have only to bring the same rules to bear upon this as upon negative development to secure any desired class of image.

When development is complete, the prints should be transferred to a dish of water, slightly acidified with acetic acid to the extent of about fifteen minims to the pint, to arrest further action. Here the prints may remain until the whole are finished, when an ample washing, to remove all traces of the developing solution as well as the acid, must be given. The toning is then proceeded with in the ordinary manner, and with any of the ordinary baths, and, though the colour may be different to start with, the progress is similar, especially in the final stages, to that of prints made in the ordinary way.

We have already stated in our previous article that the results obtainable in this manner are quite equal to those obtained in the usual way, both as regards quality and uniformity, and we may now add that, if there be any truth in the belief that developed images possess greater permanency han those obtained by "printing out," then there is an additional argument in favour of the combination of printing and development.

Fellowship of the Royal Photographic Society.—From several inquiries that have reached us in relation to this subject, some misconception seems to exist, and we may take this opportunity of removing it. Only those members elected prior to January 1, 1895, have the right to claim Fellowship, on payment of an extra annual subscription of 1*l.* 1*s.* Members elected since the date named rank as such, and can only become Fellows on satisfying the Council that they possess such qualifications as may be defined, and on paying an extra annual subscription of 1*l.* 1*s.* Thus, any of the *members* elected since January 1 last, if they desire to become Fellows, had better make formal applica ion to the Council and await events.

The Hand Camera Scores.—"The opportune use of the hand camera," says Sharland's *New Zealand Photographer*, "has been well illustrated by our friend Pegler, of Onehunga :—At the recent Agricultural Show a photographer was struggling under the dark cloth in the vain attempt to focus a prize stallion who restlessly pranced round. Our snap-shot man took in the situation at a glance, and in a moment secured a splendid negative of the whole scene, including, of course, both the horse and the camera man. Of this he afterwards made a good whole-plate picture." The incident supplies an illustration of the fact that there are many occasions when the hand camera will be found of great use and assistance to the professional man.

Elasticity of Solid Gelatine Solutions.—The elasticity of solid gelatine solutions, says *Nature*, is the subject of an investigation by Erwin Fraas, in *Wiedemann's Annalen*. Sticks of aqueous gelatine were obtained in the following manner. Brass tubes, about a foot long and half an inch thick, were cut in two at the centre and joined by wire rings. They were closed at one end with a cork, and were placed vertically. The gelatine solutions were then poured in, care being taken to prevent adhesion by rubbing with olive oil. The suspension of the sticks was a matter of some difficulty, but it was accomplished by brass clamps of the shape of a cylinder, cut along its length on both sides and roughened inside, which were gently pressed on the gelatine by a spring. It was found that in no case did the volume change by stretching, the diminution in girth being compensated by the increase of length. The addition of common salt impaired the elasticity and strength of the sticks very considerably, making them unfit to support a pound weight, while part of the water could be replaced by glycerine, cane sugar, or gum arabic, without making any difference.

Argon.—The existence of the newly discovered constituent of the atmosphere, argon, about which Lord Rayleigh and Professors Ramsay and Crookes discoursed before the Royal Society last week, is thus early being subjected to doubt and criticism. Mr. J. A. Wanklyn writes to a contemporary on the subject: "It is not the first time that, within my own experience, the organisation of our Royal Society has been employed to give currency to a myth. On a former occasion it was a so-called calculus, wherein the symbols of mathematics were used so as to simulate the application of mathematical operations to chemical questions. Now we are informed that about one per cent. of the volume of the air, or that about one and a half per cent. of its weight, consists of a new substance. The experimental result, however, is that only about one-twentieth of one per cent. is exhibited. As I was not one of the invited, I could not attend in person at the meeting on Thursday last; but I have read the published reports, and I see no reason to alter my opinion as to the part which nitrous oxide bears in the chemistry of the atmosphere." Those of our readers who are interested in the chemistry and physics of argon should procure the last number of the *Chemical News*, which gives the papers of Lord Rayleigh and Professors Ramsay and Crookes in full.

Free Portraits and Free Watches.—A further development of the free-portrait business is shown in the annexed circular of the Monochrome Portrait Company, Ealing, which, with a most impressive generosity, not only gives away artistic portraits, but also gold watches. How kind of the company, to be sure!—"*Ealing, London, W.*—Dear Sir or Madam,—We have received your name and address, and think you will be a suitable person to introduce our monochrome portraits in your locality. If you care to partake of this offer, kindly send a photograph, and we will make from it one of our artistic monochrome portraits free of charge, on condition that you show it to your friends, *have it neatly framed here*, and recommend us as much as possible. In addition to each person receiving a portrait and will promise to distribute a few of our circulars amongst their friends, we will present a richly engraved aluminium gold watch, either lady's or gent's size, as desired. These watches are fully jewelled and specially examined, and are excellent timekeepers, and are exactly like the accompanying engravings, and are fully equal in appearance to a 20*l.* solid gold watch. These watches are given as payment for recommending our work, and will be sent in the same box with the portrait. We employ several first-class artists, whose work cannot be surpassed. Our pictures are in some of the best families in England, and all admit that our portraits are excellent." The sentence we have placed in italics should, of course, convey to a person of fair intelligence the pith of the method whereby this philanthropic Company endeavours to recoup itself for its kindness and enterprise. Unfortunately, the average of public intelligence is low, very low. "Some people has plenty brains," &c., as the Claimant observed on a memorable occasion.

MR. J. R. GOTZ has removed from 150 to 215, Shaftesbury-avenue, W.C. He will in future devote himself to process work and the sale of photographic printing papers.

JOTTINGS.

It is a pity that when the Council of the Royal Photographic Society decided upon awarding the Society's progress medal to Dr. P. H. Emerson, an immediate announcement of the decision was not made public. This would have removed much doubt and conjecture consequent upon the uncertain degree of reliance to be attached to mere unofficial rumours in some of the photographic papers. Neither the Council nor Dr. Emerson had anything to lose by publicity. Why was the announcement delayed? The last number of the Society's journal contains a mean two-lined paragraph to the effect that "the Council, at their last meeting, awarded the progress medal of the Society to P. H. Emerson, B.A., M.B. (Cantab.), for his work in the advancement of artistic photography." So the Society's officials inexplicably kept this decision secretly locked in their breasts for three weeks! But, in the meanwhile, it leaked out through other channels, and, consequent upon the furtive way in which it was allowed to gain publicity, drew any amount of incredulity and ridicule from those who are ever on the alert to stab the Society in the back.

Thus: I read that the "incidents attendant upon the awarding of the medal are likely to give rise to unpleasantness." The same writer also characterises the award as "a decision which could not but cause surprise and adverse criticism, *but, for reasons not stated, it was decided to keep the matter a close secret.*" In regard to the first of the two quotations I have made, it is a case of the wish being father to the thought; as to the statement conveyed in the italicised sentence, the writer has been victimised by his imagination—no such decision was come to. Such silly remarks would not be fathered by any photographic editor, so that none of the Society's well-wishers are likely to be deceived by them; but it must be regretted that the outside public, to however small an extent, should be placed at a disadvantage in regard to learning the real position of matters. It will amuse my readers to know that I am quoting from a charming journal, the *Artist*, which runs a photographic department "under the direction of Mr. Horsley Hinton," and wherein the remarks referred to appear. Which accounts for the milk in the cocoanut, you see!

Then, here's another funny thing in connexion with this progress medal, in noticing which I have been forestalled by the editor of a contemporary. In an East country journal, the award to Dr. Emerson, "the greatest distinction given for photography," is complacently mentioned, and a minute account of the proceedings of the three Council meetings of the Society at which the question of the progress medal came under discussion is given. Mr. C. P. Goerz is called "a German writer on optics;" and "Professor" Lumière a "French student of colour photography." Captain Abney is stated to have wired his vote from Switzerland, and "Dr. Emerson was elected medallist by an unprecedented majority." Dr. Emerson is also said in my Eastern contemporary not only to have "entirely revolutionised the practice of pictorial photography," but "has made contributions of deep optical and psychological interest to scientific papers," "suggested many improvements in lenses, cameras," &c., and so on. There is a great deal in this to make us smile and think of dear old Vincent Crummles. You all remember him: the inimitable theatrical manager in *Nicholas Nickleby*, who, when he saw anything laudatory about himself in the papers, would say, with assumed unconcern, "I can't think who puts these things in. *I* didn't."

While I am on the subject, I will say that I think the award is not altogether an unhappy or an unwise one. Emerson has been both an earnest thinker and worker in pictorial photography, whose expressed thoughts and work possibly do not carry complete conviction to many of us (myself among the number), but there is no gainsaying the fact that the influence of his precept and example upon the photography of the last six or seven years has plainly been a good and ennobling one. He at any rate has sent many photographers in quest of high ideals in camera work, and, though they may not have attained them, the results are all the better for the traces they bear of applied art principles and creative imagination. But, above all things, Emerson, besides being an accomplished man strikes nearly everybody as honest and fearless, a hater of shams and cads, and a right good sort at bottom, and these will supply additional reasons, if any were wanted, why the award of this year's progress medal will assuredly be popular.

Some of the inhabitants of Pekin do not take kindly to the sight of a camera, according to Mr. Thomas Child, who read a paper on the Chinese capital the other night at the Society of Arts. Speaking of the uncouth ways of the priests of one of the Buddhist temples, he says, "They are most averse to photography, and several times I have been bundled out with all my kit pretty roughly." Under these and similar discouraging circumstances it reads much to the credit of the lecturer's skill that his lecture was "beautifully illustrated," the negatives being mostly taken by the collodion process. Years ago I heard it seriously stated that Chinamen were so much alike that one photograph would pass current for the portrait of a good many, and thus a native photographer had simply to lay in a number of copies of the one original to be able to fully supply the requirements of his sitters. As a matter of fact, I have been assured by Chinese travellers that, at the first go-off, the natives all look pretty much alike, but that gradually the difference in appearance becomes apparent, soon increases, and finally seems as marked as among other races.

The inevitable boom in process reproductions from photographs has set in with great severity. The enterprising Americans who sold an album of sixteen 10×8 views for sixpence *and* a coupon have been outdone by a native firm, who give twenty half-tone reproductions for sixpence *without* a coupon. Then, among other new weekly publications, we have the *Album*, a sixpenny journal of "photographs" of men, women, and events; and *Photos*, containing sixteen "photographs" for a penny! These be prosperous times for the photo-mechanical block-maker!

The output of photographically produced blocks, especially of portrait subjects, is so great that I am confident editors must now and then be at their wits' ends for up-to-date celebrities or notorieties to put in their papers. When they can't get one or the other class, I suppose they fall back upon nonentities, chiefly of the female persuasion. The other day I was looking through several numbers of one of these phototypically illustrated publications; it is devoted to stage beauties, and others. Without giving myself away, I think I may safely say that I quite know who is who in stage land, but for the life of me I could not identify many of the ladies who figured in this publication. I suppose they were vain amateurs, or obscure provincial artists enjoying an ephemeral glory during pantomime time, who paid for their portraits to be included.

How easy it is, then, for people to get their photographs about nowadays; and how general the disease is becoming! Why, even some photographic editors do not disdain the small vanity of publishing their own photographs; not that anybody but themselves wishes to see them, of course. In the previous paragraph I referred to the absurd lengths to which the publication of the portraits of theatrical "celebrities" is carried. Here are a few remarks on the matter by a clever dramatic critic, which emphasise my own:—

"The occasion may be improved by remarking upon the preposterous degree to which the photographing and interviewing business has been carried. Until vanity ceases to be the mark of *the* profession, it is perhaps hopeless to expect to put an end to this system of advertising; but, the celebrities being exhausted—and the stock of them is running out—the interest of the public, at any rate, can hardly be maintained in the undistinguished performers who commonly figure, in various positions, in the lesser illustrated papers. It would be quite a distinction for an actress to be known as the woman who has *not* been photographed and interviewed; and others, envious of the reputation it would give her, would, no doubt, follow her example."

Clearly, as has been said before, we are in danger of suffering from over-illustration, thanks in great measure to photography. A few weeks ago I was solicited for my votes by two candidates for the local district council. One man was a labourer, the other a schoolmaster, and their electioneering bill was adorned with their portraits, half-tone blocks from photographs. I should have voted for those men if I had not seen their pictures, which represented them as possibly well adapted and circumstanced to look after their own business, but not other people's. Here, perhaps, was an advantage to me in the facility and cheapness of modern methods of photographic reproduction. It was not so with the candidates. Their looks spoilt them. They were beaten. I shall have more to say on the topic started in the last few paragraphs on a future occasion.

Tuesday next is the last date by which voting papers for the election of the Council of the Royal Photographic Society are to be sent in. I again beg to direct the attention of members to page 41 of this JOURNAL for January 18, where the attendances of the members of Council for 1894 are given. It will e seen that the old Council has worked well. The Fellowship scheme, which already is amazingly popular, is due, in inception and details, to some of the outgoing Council. Notwithstanding this—notwithstanding the admirable way in which that body has managed the affairs of the Society during the last year—it is sought to turn some of the members out, and substitute for them a number of gentlemen whose qualifications for office may be stated in the algebraical symbol x. Let all members having the welfare of the Society at heart combine to defeat this miserable scheme of truckling to social standing, by re-electing the old Council. COSMOS.

PHOTO-MECHANICAL WORK IN JAPAN.

[London and Provincial Photographic Association.]

I THINK a short description of the most successful photo-mechanical works in Japan may interest your members, the more particularly as the conditions of working differ a good deal from those in either Europe or America, and, further, because I am permitted to give more complete details than are usually given in describing such works.

The works I am about to describe are those of my friend Mr. K. Ogawa, who was the first, and for some years the only, photo-mechanical worker in Japan, if we leave out of consideration photo-lithography, which has long been used by the military survey department for reproducing maps.

The principal work done by Owaga is collotype, photo-lithography, and what he calls "photo-engraving," by which he means the production of and printing from half-tone plates in copper, to be mounted type-high, and printed along with letterpress. In fact, if one may be allowed the expression, it is half-tone photo-zinco on copper.

COLLOTYPE.

To begin with the collotype work, I shall describe exactly how plates are prepared and printed from.

The largest size that is worked is 24×17 inches; this is the size of the image, but paper with a wide margin can be printed.

The first operation is the stripping of the film of the negative. This is done by thickly coating the film with collodion, drying, and then placing the plate in a weak solution of hydrofluoric acid. The film presently floats off, and can readily be turned over and brought into contact with another glass plate, which has been coated with a film of gelatine to promote adhesion. Plate glass is always used, as the reversed negative, along with the collotype plate, have to be brought into contact in a strong screw-down printing frame. Mr. Ogawa has brought this process of reversing stripping negatives to such a state of perfection that he does not average one failure in a thousand. He tells me that, if too much hydrofluoric acid is used, the gelatine film will expand, or even wrinkle, but he could not tell me how much it is right to use. Understand it was no case of would not. It has to be admitted that a great part of Ogawa's work is what would be called "rule of thumb" amongst us, or, better perhaps, without rule at all. He mixes many of his preparations on about the same principle that the average individual mixes tea, milk, and sugar. The results only can justify such a way of working, but they do, not only in their excellence but in their uniformity.

The support for the chromated film is plate glass, about half an inch thick, the edges and corners rounded by grinding.

A thin substratum of silicate of potassium and albumen is first applied, dried, washed, and dried again.

One of the difficulties in the way of working collotype in Japan lies in the great range of temperature between summer and winter, and the excessive heat of the summer for about two months. It is impossible to work with the same sensitive solution all the year round. It has to be varied with the temperature. Ogawa uses Nelson's opaque gelatine, Coignet's "Gold Medal," and also isinglass, the last-mentioned only when the weather becomes very hot. In cold weather the soft Nelson gelatine constitutes the greater part of the whole, but, as the weather gets warmer, the quantity of the hard Coignet is increased, eventually the Nelson is omitted altogether, or nearly so, and isinglass is added, even chrome alum if the weather becomes very hot.

The total quantity of colloid used is, in any case, some six or seven per cent. of the solution. The quantity of bichromate is also varied. A mixture of equal parts of bichromate of potassium and of bichromate of ammonium are used. In warm weather about one and a half per cent. of this mixture goes to the solution, but in cold weather the quantity is increased. By these variations work goes on with the temperature in the printing room varying from very little above the freezing point to far above ninety degrees Fahr.

The plates are coated by hand, and are dried in a large drying cupboard, heated by a jacket of water, which is kept near the boiling point by a charcoal brazier below. The temperature is supposed to be about 100 degrees Fahr., but it is years since a thermometer has been near the cupboard! The plates take about two hours to dry.

As already stated, the printing is in heavy screw-down printing frames. After printing, the plate is sunned from the back for a certain length of time, which depends on the density of the negative, the sunning being longer for negatives with strong contrasts than for those with weak.

The image is seen in a strong brown colour, but the plates are washed by being laid flat in a sink with water running over them till the last trace of colour is removed. This washing occupies about half an hour in warm weather, considerably longer in cold. The final image has a faint, delicate, ground-glass appearance.

In the printing room are eight hand machines of modern French make, the smallest capable of printing an image 15×12, the largest 24×17. The inking is done by hand with two rollers. The first used is a leather roller with a diameter of about four inches. With this a stiff ink is applied. Next, a composition roller, of a diameter of about an inch and a quarter, is used with an ink of the same tint as that first used, but thinner. At one time Ogawa used two slightly different tints with two rollers, but he has given this up. The leather rollers are made in Germany, the composition in Japan. I was assured that there is no difficulty either in getting a new leather roller into condition or in keeping one in condition.

In the highest-class work a very expensive Japanese paper is used, which is found to render the half-tones better than any foreign paper. With this high-class work only about thirty impressions an hour can be pulled, and a plate is not expected to last for over about 300 impressions. Perhaps it would be more correct to say that 300 is about the average number of impressions that can be pulled from one plate. Using European paper, with a high surface, prints are pulled at the rate of fifty per hour, and the average life of a plate is about 500 copies.

Spotting is done by girls; but, except this, all work, both in the collotype works just described and in the copper-plate work about to be described, is by men.

CHROMO-COLLOTYPE.

Recently chromo-collotype has been worked to a considerable extent. This is not any "three-colour process," as the term is commonly understood, or anything of the kind. It is really merely a mechanical method of colouring collotypes, and my only excuse for describing it at some length is that it produces, in my opinion, better results, in the way of mechanical colouring, than I have seen, except in the case of the highest class of Japanese coloured wood-block pictures, in which, incredible as it may appear, it is not uncommon to use as many as eighty wood blocks, with different tints, in reproducing one single subject.

I do not even know what novelty there may be (or may not be) in the process, but I describe it exactly as I have seen it worked.

First, an ordinary collotype is made, and this is handed to an artist, who colours it, using whatever may be the fewest pigments that he considers necessary to produce the effect that he aims at. An average number is about eight, but sometimes as many as twelve

are used. The single copy having been coloured, a number of copies are taken corresponding to the number of pigments that have been used, and each of these is coloured by the same artist with some one pigment in the parts corresponding with those to which the same pigment was used in colouring the first collotype. These pigments are all of the nature of transfer ink, and a transfer is made from each of them to a lithographic stone.

The transfers having been made, the collotypes are passed over the stones, each imprinted with one particular tint only, the number amounting to anything up to twelve. Perfect register is kept by two needles fixed in holes drilled in the stones, and passing through diagonally opposite corners of the paper.

Photo-engraving.

Now for a brief description of the "photo-engraving" works. These, it may be mentioned, are in Tokyo, "the city of magnificent distances" (and poor means of transit), just about four miles distant from the collotype works.

In the collotype works machines are worked by hand labour, in the other works an oil engine of six and a half horse power (actual) drives the machinery, but is proving unequal to the work it has to do, and will have to be replaced by a larger one. By the way, the oil engine does not seem to have received in Europe the attention that it deserves as a motor. With certain conditions, it is to be preferred to a gas engine. The engine, which works at 180 revolutions per minute, has to do its best to work the following machinery: A dynamo for one arc light of 2000 candle power, and incandescent lamps to light the works, a facing lathe, a routing machine, a circular saw and rotary trimmer for wood, zinc, or copper, and four single-cylinder printing machines, with reciprocating type beds, not to mention a grindstone and a pump. These machines are never all in motion at the same time, but the power is not sufficient even for those that it would often be desirable to have working together.

The process worked is that generally coupled with the name of Meisenbach—that is to say, it is a process with a fine cross-lined screen. The screens, 12 × 10 in size, with lines spaced from eighty to 135 to the inch, are the well-known diamond cut screens of Levy. They are the first of the kind that I have seen, and are certainly most exquisite pieces of work, vastly superior to photographically prepared screens that I have seen and used.

The negatives are made on collodion. Ogawa declares that he has not been able to get results on dry plates to compare with those he gets on wet, but he admits that he has tried no plates specially prepared for photo-mechanical work, not even very slow plates of ordinary make. The negatives are made very clear in the transparent parts, but less dense than negatives that I have been accustomed to see used for the half-tone zinco process.

The Screen and its Effect.

I often wonder how many people have tried to think how it is that a screen does have the effect that it has in producing a negative that will print in half-tone? The question asked, the answer commonly is, "Oh, that is quite simple! It just breaks up the image into little squares, and that is all that is wanted to get a negative from which a half-tone can be made." This is by no means all that is necessary, or all that is done. Were this the whole action, the negative would consist of squares all of the same size, but of varying density. Now, what actually happens is that we have squares all of practically the same density, but of varying size. I have never seen any explanation of this most remarkable fact, nor have I ever read any attempt at an explanation that would hold water at all. I may be the greater fool for attempting one, the more particularly as I am not able to give a full explanation, only able to state in which direction I think the solution of the problem is likely to be found.

Briefly stated, it must, of course, be admitted that the image, as a whole, is a dioptric image, formed in the way of ordinary photographic images, which can be traced geometrically by following the axes of pencils of light. I believe, however, that the individual dots are not dioptrically formed, but are diffraction images of the diaphragm of the lens. If this be not so—or, at least, if the dots be dioptrically formed—why should not contact with the plate be the best position for the screen? And, still more, why should alteration of the distance make so marked a change in not only the size but the shape of the dots? A change not to be accounted for dioptrically. I have a confirmation of my theory in the peculiar form and position taken by the dots that represent the well-defined boundary line between a strongly contrasted light and dark shade or tone.

The strongest confirmation of my view is, however, to be found in the fact that the shape of the diaphragm has a marked effect on the shape of the dots. Dioptrically, it could have no effect at all. I cannot pretend to give a full explanation of the way in which the dots are produced by diffraction and interference. I must leave that to those who are better up in the theory of these phenomena of light. I have failed even to follow Dr. Abbe's demonstration of the formation of the image in the microscope by diffraction when an objective of short focus and great angular aperture is used, but I believe his theory is generally accepted.

To return, however, to the practical aspect of the affair, Ogawa finds a distance of one-fifth of an inch, including the thickness of the cover glass of the screen, to be about the best distance for average work, between the screen and the plate, and he generally gets the best results with a square diaphragm, though, in some cases he uses one of the form shown in the margin. He most commonly uses a diaphragm of about one inch square, with a lens of thirteen inches focal length. This is focus for a distant object. Of course, in copying from prints of sizes not very much greater than those of the negatives, the conjugate focus is really very considerably more.

The following results of experience were communicated to me:—

(1) The less contrast there is in the subject being photographed, the greater should be the distance between the screen and the plate.

(2) The greater the distance between the lens and the plate, the larger should the diaphragm be.

Etching.

The chemical process used is one that has been largely advertised and sold in both America and Europe as a secret process. As Ogawa paid for it as such in America, I, of course, refrained from asking him the actual substances used; but I may say that I feel pretty sure that recently published processes are of a very similar nature. The following is a description of the process as one sees it worked:—

A copper plate is coated with a certain solution, containing a chromate or a bichromate, a "whirling table" being used, is dried, and is printed in a heavy screw-down printing frame. I ought to mention that the light used both for taking the negatives and for the printing I have just mentioned is either daylight or electric light, whichever may be the most readily available at the time that an exposure has to be made. The exposed plate is developed in cold water, to which a little aniline colour is added, to enable development to be the more readily watched.

Developed and dried, the plate is retouched, if necessary, with a needle point. It is then heated over a Bunsen burner to a very high temperature, which is recognised by a slight change in the colour of the metallic copper. The plate is now ready to be etched without further treatment. The etching fluid is perchloride of iron solution, and Ogawa prefers to use a strong solution, as he finds that this, though it acts slowly, does not undercut, as a weaker and more quickly acting fluid is liable to do.

Re-etching is generally necessary, and this is done in a way that may be well known to the trade, but is new to me. In former years, so far as I know, re-etching was done by protecting those parts that were not to be re-etched, and returning the plate to the re-etching fluid. Owaga re-etches by applying the etching fluid with a fine hair-pencil to those parts of the plate that have to be deepened.

Plates are made "for the trade;" but, as will have been gathered, printing is also done in the works. The four machines are each capable of turning out 1500 impressions per hour, or a total of 6000 per hour. The present war between China and Japan has given the works all that they can do, and, working two shifts, impressions are, at the time of writing, turning out at the rate of 100,000* per day. A plate is cleaned with turpentine after about 500 impressions have been printed. The coating is not cleaned off the plate before printing, and, according to Ogawa, it is a great advantage to have it on the surface of the copper, as it takes the ink much better than will the metallic surface. It will stand an indefinite number of impressions, and makes it possible, with a given surface of paper and quickness of printing, to get more impressions without clogging of the block than would be possible with the actual copper surface. The same effect cannot be got with a simple albumen film.

I have no idea of the prices at present charged for work of the kind I have been describing in Europe, but it may be interesting to know that Ogawa makes plates of the kind that I have been describing for the trade at a rate corresponding to about 6*d.* a square inch, and turns out prints of about cabinet size; if he gets a large enough order (paper supplied to him), at a rate of more than 200 for a penny. In such cases, however, six different pictures are

* 100,000 *impressions;* but, as small pictures, when possible are printed six or eight together, the total number turned out is very much greater than this.

etched on one plate, or six small plates are fixed to the bed of the machine.

In connexion with, or, at least, in the same set of buildings as the collotype establishment, is a studio thirty-six feet long, for every-day studio work; at the other establishment there is a set of show rooms, &c.

I send samples of the various kinds of work supplied, so that you will be able to judge of the quality.

P.S.—I should state that I am, of course, well aware that diffraction has been mentioned as a factor in producing an image from a cross-line screen any time during the past ten years, but the statements I have seen have been of a somewhat loose nature, and I have not seen, before the theory that I now put forward, that each dot is a diffraction image of the diaphragm. W. K. Burton.

PHOTO-CHEMICAL NOTES.

A New Method of Silvering Mirrors.—In following up their experiments along the lines of M. Lippmann's discovery, MM. Lumière Brothers find that one of the most expeditious and, at the same time, a very simple and economical, method of silvering mirrors is to utilise the well-known reducing properties possessed by "Formalin," which, as pointed out some months ago in these pages, is a strong solution of formic aldehyde. They use a bath of ammoniacal silver nitrate, which, it is to be noted, should barely contain an excess of ammonia. To this is added *quant. suff.* of a solution containing one per cent. of formic aldehyde. The mixture is poured quickly over the clean glass plate so as to cover it immediately; in five minutes the deposition of the silver is complete, and the mirror can be washed and dried.

Luminous Phenomena during Crystallisation.—A paper on this somewhat obscure subject by M. Ernest Bandrowski (*Zeitschrift für Physik & Chemie*) seems to throw some light on certain phenomena which have been observed in photographic practice.

Within the last two years several correspondents in the photographic press have placed it upon record that, after removing a plate from the fixing bath and rinsing it, they have seen, on placing it in the alum bath, a distinct luminescence of the plate to take place, to the observation of which the darkness of the developing room was favourable.

Bandrowski's experiments show that a great many salts, on crystallisation from aqueous solution, emit a feeble light. Such phenomena were not unknown before. Arsenious oxide, when crystallising from a hydrochloric acid solution, was known to give out light, and Berzelius had observed that sodium fluoride, on slow evaporation, exhibited many pale sparks. The cause of these facts has hitherto been left to conjecture. Bandrowski's idea is that the luminescence is caused by electrical discharges connected with the first process of crystallising, and in support of this hypothesis he has found that luminous action is noticeable in the cases of those salts which are easily electrolysed, such as sodium and potassium chlorides, potassium bromide, sulphate, and nitrate in aqueous solution.

A Substitute for Sulphuretted Hydrogen.—There is probably no greater deterrent from the utilisation of chemical analysis among photographic chemists than the almost absolute necessity of employing sulphuretted hydrogen. The apparatuses from which it is generated are by no means satisfactory, and the chance of any considerable escape of such a reagent among sensitive plates or paper is one which the manufacturer rightly sacrifices much to avoid.

A substitute for sulphuretted hydrogen, which promises to be much more convenient in use, has just been introduced by R. Schiff and N. Tamgi, of the University of Pisa. The substance is thio-acetate of ammonium. It is prepared by dissolving thio-acetic acid in excess of dilute ammonia. The acid itself is made from acetic acid, and pentasulphide of phosphorus, and is a liquid boiling at about 95° Cent., and very sparingly soluble in water. In ammonium solution, however, it is very soluble, and a thirty per cent. solution of the ammonium salt may be obtained. About twenty to thirty minims of such a solution, added to the substance, which it is required to test, will serve the purpose of sulphuretted hydrogen on heating the solution to nearly boiling. The reactions of the reagent with the more important photographic chemicals are given below:—

Silver Salts.—Sulphide of silver is precipitated. Even chloride, bromide and iodide of silver, when warmed with the thio-acetate solution are completely converted into silver sulphide.

Mercury Salts.—In the cold, a red precipitate of sulpho-chloride, which is converted on heating into black mercuric sulphide.

Platinum Salts.—In the cold a red precipitate, converted, on heating, into black platinum sulphide.

Gold salts give the same results as those of platinum, and ferric salts are reduced to the ferrous state.

Separation and Estimation of the Halogens.—The quantitative separation of the halogens has formed the subject of considerable experiment of late, and in the *Zeitschrift für Anorganic Chemie* (i. 405-422) C. Friedheim and R. J. Meyer give an account of their experience of the various methods in use. As a result of their examination, they state that the most satisfactory method is one which they have adapted from those of Gooch, and Browning, and of Dechan. The solution of the alkaline haloid salts is placed in a retort with about 2 grammes of potassium arsenate, and about 100 c. c. of water; 20 c. c. of dilute sulphuric acid is then added, and, on boiling the mixture, iodine only distils over. It is collected in potassium iodide solution, and titrated with hyposulphite solution. About 10 grammes of potassium bichromate are then added to the contents of the retort, and the bromine which is thus liberated likewise distilled into potassium iodide solution, and, on titrating the iodine thereby liberated, the proportion of bromine is ascertained. The residual solution in the retort contains the chlorine, which is estimated in the usual gravimetric way. G. E. Brown, A.I.C.

THE REDUCTION OF PLATINOTYPE PRINTS BY NITRO-HYDROCHLORIC ACID.

(North Middlesex Photographic Society.)

At the conclusion of a demonstration on platinotype, which I had the pleasure of giving at the North London Photographic Society on November 15, 1887, a member (Mr. A. P. Higgins) was kind enough to take away one of the finished black prints, (which I had that evening developed by the hot bath method), with the object of attempting to reduce it.

At a subsequent meeting (December 6, 1887), he exhibited to the Society the result of his experiment; the print showing slight, though decided reduction upon a portion which he had treated with nitro-hydrochloric acid. These facts were noted in the Society's reports duly published in the photographic press. Since the specimen in question was exhibited, and forgotten, I have repeatedly heard it expressed, that platinotype prints were incapable of reduction, inasmuch as the paper supporting the image became pulped under the action of the acid. This is, no doubt, the case where there is a prolonged immersion in the acid (or even in water) at a temperature of 70° or 80° Fahr., indeed, if the paper be of a particular character, such as that of a certain brand of commercial platinum paper in the market, a lower temperature would have much the same effect upon it. Platinotype paper, however, has a sufficient tenacity, and with careful handling is slow to disunite under the acid treatment. With Mr. Higgins' experience in view, and wishing to test the matter for myself, I have made several experiments, with the results which I now lay before you.

The prints at my disposal consisted of some kindly supplied me by members of this Society, and others of my own making, and may be summarised as follows:—

Platinotypes, hot bath, black tone, over three years old.
" " " three years old.
" cold bath " over twelve months old.
" " " twelve months old.
" " " recently made.
" " warm tone, recently made (bichloride of mercury added to developer).
" sepia prints, some years old.
" " " recently made.

Acid used, nitro-hydrochloride; proportions, one part nitric to three or four hydrochloric.

With regard to the first item on the list, viz., hot bath, black-tone prints over three years old, I have been unable to effect the slightest reduction in them, notwithstanding I raised the temperature of the acid until the paper showed signs of pulping. I had, however, one print, which the producer informed me was three years old, and that I did succeed in reducing, in the warm acid, but in a most inconsiderable degree.

I next turned my attention to cold-bath prints made during 1892, 1893, and 1894. I could detect no appreciable loss of tone in the only specimen I could obtain of 1892 production. The 1893 prints which I treated were all reduced more or less, but only when the temperature of the acid was raised. Two of them appear to have undergone a very little alteration.

Coming next to 1894 prints, the easiness of reduction compared with those of 1893 was marked; in fact, the majority were reducible in acid of normal temperature. In two instances only was it necessary to raise the temperature of the acid. I have here some two or three dozen specimens of these reductions for your inspection.

In viewing these results, and bearing in mind the data connected with them, what is most noticeable is the fact that the acid has readily acted upon the prints of comparatively recent production, has acted far less readily upon those of older date, and has practically effected no alteration

in those of upwards of three years old. It would appear, then, that the substance of which the developed black image is composed undergoes some change as time advances, rendering reduction more difficult, until a period is reached when reduction is not feasible without destroying the paper.

If a change does occur, I cannot explain it, not being in any way a chemist. I would, however, mention that a chemist friend informs me that the oxides of metals are less easy of reduction after having been kept. I always understood the image of a platinotype black print to consist of platinum black—that is, the metal platinum in a very finely divided state, and I find, on reference to Bloxam's *Chemistry*, that "experiments by Berthollet indicate that platinum black is really an oxide." Whether this is an explanation I cannot pretend to say.

All the prints where bichloride of mercury had been added to developer were easily reduced, some by dilute nitro-hydrochloric acid, as also were those of sepia platinotype, and amongst the specimens I show to-night will be found two sepia prints, which originally were much over-printed and fogged on development, but which I have reduced to presentable conditions. With regard to sepia prints, no doubt hydrochloric acid alone will effect reduction if the prints be treated with it immediately after development.

An apology is due to you for your detention over a matter which, perhaps, is not of general or practical interest. The peculiarities of the behaviour of the platinotype image under aqua regia are, however, I venture to think, worthy of consideration, and, if in submitting the matter to your notice I may be the means of inducing other members to bring forward any unusual features which have presented themselves during photographic manipulation, I shall consider my time well spent in the interests of this Society. FRED W. COX.

SOME STUDIO BLINDS AND REFLECTORS.

THE most important difference between the domestic window blind and those for studio use is, that in the one case their sole use is to reduce the general illumination of the apartment, and in the other to reduce it partially and locally without any regard to the remaining space. No special kind of blind can be recommended for indiscriminate use in all studios—the position and form of the glass room must determine the most appropriate device. It is, however, imperative that one and all fulfil certain conditions, and be under easy control of the artist.

Primarily, they must obstruct the passage of all direct light, and be so under control that light may be admitted at any place and any angle the operator may think fit, and that with celerity and a minimum of trouble. Formerly, the special lighting was almost entirely limited to the end of the studio occupied by the sitter; in these days, there is no special place for the sitter, who is posed anywhere in the studio that may suggest itself to the artist as suitable for getting the effect he desires. This necessitates the arrangement of blinds that cover the whole of the glass, and that can be withdrawn at any point independent of the rest. It is a golden rule to have *no more* light than is necessary for the effect desired. If we adhere to this, we improve the brilliancy of the image wonderfully, without in any degree lengthening the exposure. It was with this idea tunnel studios were constructed, and, when the model was always placed within a few feet of the end of the room, there was much to recommend them; the eyesight of the operator was certainly advantaged when every exposure had to be developed immediately after it was made, the continual change from the light to the gloom of the developing room was very trying. The tunnel form in a measure removed this, preserving a much-reduced light for manipulating the camera, so much so that focussing cloths could be dispensed with, and the movements of the operators be less observable from the sitter's position; the two latter conditions would even now be an advantage where the model is placed before a fixed background.

Perhaps the most generally popular and useful form of studio is the oblong, with a ridge roof, supplying a north light—a more equable light than any other, and, consequently, more easily managed, and one by which almost any, except direct sunlight, effects can be obtained. By having the south side made substantially of bricks and mortar, and the roof slated, unpleasant summer heat is very much modified; the advantage of a moderate temperature is more than equivalent to the extra glass area. One window of moderate dimensions may be useful in the roof, and a similar one in the wall on the sunny side, to lighten the shadows, in place of reflectors; but, as I have remarked, a solid heat-resisting wall is the principal thing, and we do wisely to sacrifice a little light for this result. In this connexion, a blind, or rather a canvas sheet, stretched over, and a few inches above, the roof, moistened with jets of water from a pipe laid along the ridge, is a very effective means of reducing the temperature in sultry weather; otherwise, outside blinds are not much use in a studio of this form, for, with the exception of a short time in the middle of the day in the height of summer, no direct rays enter the studio. The advantages of covering the whole of the glass with white paraffined paper, irrespective of blinds, is a means of getting very soft images, with very little difference in exposure to unobscure glass; in fact, if the studio is much surrounded by high buildings or trees, the light will be increased rather than diminished. The paper may either be attached to light removable frames or permanently to the framing of the glass. This kind of paper remains colourless a long time, and, in case of damage, is easily replaced.

With respect to the blinds proper, they consist of two sets white and opaque. The dark ones are made of green or dark blue material usually employed for the purpose. Green retains its fresh appearance rather longer than the blue; in other respects they are equal. The side blinds should not be more than two or two and a half feet wide attached to spring rollers at the bottom. The plan of drawing them down from a fixed point at the top is a decided waste of power, and induces certain troubles in lighting the sitter that the opposite method entirely avoids. The roof blinds consist of two separate sets, meeting in the centre, their number, of course, depending on the width of the skylight. Two sets of three each are generally sufficient, the edges overlapping, say, one width near to the glass and two widths a little below it. The wall ends are permanently fixed, and the free ends stiffened with laths. These blinds run on wires passing through rings sewn to the blinds, and are moved by endless cords passing to and fro through pulleys. The operator can stand in front of his model to adjust the lighting exactly to his taste without the objectionable walking backwards and forwards to make little alterations. A very few inches more or less light will make a great difference in the character of the illumination, and the fact of occupying a position during the adjustment from which every slight variation can be noticed is a great assistance, that must be experienced to be fully appreciated. Additional blinds of blue gauze merely hung on cords across the studio, and moved somewhat after the style of hoisting a sail on board a vessel, will be found of use. When the sitter is troubled with weak eyesight, it will with very little difference to the exposure, if any, afford considerable relief, and permit the pupils of the eyes to expand, thus improving the expression. The foregoing are all the fixed blinds required for the average glass room.

The up-to-date photographer is not contented with the limitation of two ends of a room, but will place his model in various parts of it. Two or three small movable backgrounds come in useful for special effects. If a kind of tunnel is made—by placing two backgrounds parallel about five feet apart, and throwing a curtain or cloth over the top, the sitter being placed a short distance from one end, and the camera at the other—very delicate effects of shadow may be obtained, regulated by the distance the model is placed from the tunnel, a suitable background being contrived from the accessories available. This device is, I think, one of the best for obtaining effects in fancy lighting I know of, being very much more under control than when the open studio is used, and being, so to say, independent of any peculiarities in the construction of the room.

Hand in hand with blinds are reflectors. Their usefulness depends very much on the kind of glass room and the colour of the walls and surroundings. A predominating pale blue or drab tint is almost equivalent to reflectors, and, with the lighting arranged as described, reflectors are almost a superfluity; however, supposing the walls and surroundings are dark, they become absolutely necessary. They may be made somewhat after the fashion of a swing mirror; a light wooden frame, three feet wide by four long, covered with white material on one side and blue on the other, is a very useful kind; another about two feet square, fixed on a telescopic stand with a universal joint, is also a handy contrivance. EDWARD DUNMORE.

COPYRIGHT IN PHOTOGRAPHS.

PRIOR to the passing of the Fine Arts Copyright Act, 1862, the authors of paintings, drawings, and photographs had, so the preamble sets forth, no copyright in such their works; and, it being deemed expedient that the law should in that respect be amended, an Act was passed which has since remained, without alteration, the statutory basis of artistic copyright. The first section defines such right to be "the sole and exclusive right of copying, engraving, reproducing, and multiplying, ... such photograph and the negative thereof by any means and in any size"—a definition that certainly seems comprehensive enough; and its duration is limited to the term of the natural life of such author and seven years after his death. It is declared to be personal property, and it devolves and can be dealt with accordingly.

After the Act had come into operation, the first difficulty arose over the question, Who is the "author" of a photograph? To ascertain the author of a painting or drawing was not difficult, and it was equally easy to do so in the case of a photograph that was wholly the work of one man; but, when a negative was the result of the combined work of perhaps half a dozen people, the question became an exceedingly difficult one to answer. For a long time it was the general custom of the employers to register themselves as the authors, but the Court of Appeal decided, in a comparatively recent case, that they were not necessarily so, and that consequently all such entries were invalid. The author, said the Master of the Rolls, is "the person who effectively is, as near as he can be, the cause of the picture which is produced—that is, the person who has superintended the arrangement, who has actually formed the picture by putting the people into position, and arranging the place in which the people are to be—the man who is the effective cause of that." That definition was accepted by the other members of the Court, being put more tersely by Lord Justice Cotton as "the inventive or master mind," and it is now the only safe test that can be applied. The Act contains no provisions as to joint authorship, but the Copyright Registry accept entries wherein two or more persons are named as authors. The point as to the duration of the right in such cases has never been decided, but it is believed that it will continue until seven years after the death of the last survivor.

But, even in cases where an employee must be named as the author, the copyright still vests automatically, by operation of law, in the employers, the photograph being made on their behalf for valuable consideration—that is, the salary paid by them to their assistant. Consequently, whenever the copyright in such a photograph is registered, the entry should be of the "author" as author, and of the employers as proprietors; otherwise it is bad in law and invalid. The copyright in a photograph is irredeemably and for ever lost if, when the negative is *first* sold, there is no agreement in writing reserving the right to either the seller or the purchaser.

There is one exception, however, to the foregoing paragraph that must be noted. If the photograph is taken for a customer who pays for its being taken, then the copyright belongs to him. The negative remains the property of the photographer, and the sitter cannot claim it; but he is entitled, on the ground of implied contract, and apart altogether from his rights under the Copyright Act, to restrain the photographer from printing copies for any purpose, except to the customer's order, and even from exhibiting a copy in his window as a specimen of his skill. If it is desired in such a case (usually termed work done on commission) that the copyright should belong to the photographer, it must be reserved to him by an agreement *in writing*.

The Act further ordered that there should be kept at Stationers' Hall a Register of Copyrights in Paintings, Drawings, and Photographs, and that no one should be entitled to the benefit of that Act in respect of infringements of his copyright unless he was entered on such register as the proprietor thereof. Registration is not necessary to entitle the author of a photograph to copyright therein—that accrues immediately it is completed; but it is absolutely necessary to enable him to recover damages or penalties in respect of the breach of such right, and then only in respect of infringements committed after registration. To be entitled to copyright, one must be a British subject, or resident within the dominions of the Crown. The precise meaning of the latter clause is doubtful, and still without judicial interpretation; but there is an *obiter dictum* of Lord Cranworth to the effect that a foreigner must be resident here at the time of publication, which is the crucial period in the production of a work. Registration can be made at any time, and by the proprietor under an assignment without registration of the original copyright. Having once been made, all subsequent assignments must be registered. The fee payable on first entry is one shilling, and the necessary forms can be obtained at the Copyright Registry.

Turning now to infringements, we find that whoever makes copies of a copyright photograph for sale, hire, exhibition, or distribution (but not for mere personal gratification), is liable to a penalty not exceeding 10*l.* for each copy; and also that a like penalty may be inflicted upon any person who, without the consent of the proprietor, imports from abroad, or sells, publishes, lets on hire, exhibits, or distributes, or offers to sell, &c., or causes to be sold, &c., any copy or reproduction of a copyright photograph, knowing such copy had been unlawfully made. Guilty knowledge, however, is essential to a conviction. These penalties may be recovered before a Court of Summary Jurisdiction, which has power to order imprisonment in default of payment; and, being in the nature of a punishment, the subsequent bankruptcy of the offender affords no release, as in the case of a civil debt. They may also be recovered in the ordinary civil Courts; or, in lieu thereof, damages, and an injunction to restrain the sale, &c., of such fraudulent copies may be claimed; and all Courts have power to order, in addition, the forfeiture of the pirated copies to the complainant. The Act expressly forbids the importation of such unlawful copies, and empowers their seizure by the Custom-house authorities, but it gives no right of entry to search therefor.

All agreements, licenses, and consents in connexion with the copyright of photographs must be in writing and duly stamped. A limited license to reproduce a copyright photograph by any particular process, or in any particular form, need not be registered at the Copyright Registry; and such a licensee can himself maintain an action for damages and an injunction in respect of infringements of his own limited right. A license to reproduce a photograph in a magazine or illustrated newspaper does not (in the absence of special provision) justify its republication separately, or in book or any other form.

ERNEST J. RICHARDS.

Our Editorial Table.

THE GRAPHIC PRIZE PICTURES.

THE entire series of the four issues of prize pictorial photographs given in the *Graphic* have now been completed, and one could have wished that they had not been suffered to terminate so soon. In No. 3 we find a fine example of the work of Colonel Stewart's ingenious panoramic camera, which was exhibited and described at a meeting of the Royal Photographic Society some time since. This camera, as described at the time, rotates by appropriate mechanism, and, as it does so, a roll-holder, containing a spool of the Eastman film, slowly unwinds, and, passing before a vertical slot, becomes impressed with the view projected by the lens, the ultimate result being a long panorama of whatever subject it is presented to. The example here shown is a *Panoramic View of Lucerne*, of the dimensions of $21 \times 5\frac{1}{2}$ inches, and, as a fine specimen of this class of work, is worth far more than is charged for the entire series of prize pictures. *The Diver*, by Louis Meldon, represents a man in mid air, who, having jumped from an eminence, is photographed when *en route* for the water, of which he is within a few feet. It eloquently shows the uninitiated to what a degree of speed our shutters can now be worked. The other eleven in this number call for no special remark, with the exception of Lily W. Hitchmough's *Little Red Riding Hood*, in which a girl, supposed to be addressing her "Granny" (a noble dog, dressed *à la* wolf in the tale), her head turned in another direction, looks as if her whole duty of life consisted in standing rigidly for her portrait. Of the thirteen pictures in Part 4, while some are rather commonplace both in conception and treatment, there are others deserving of commendation, such as *One too Many*, by Walter R. Cassels, in which a gentleman, seeing the harmony existing between a lady and another gentleman, is about to leave the room; *Children of the City*, by Alexander Keighly; and Miss Comber's *Faded Fower*.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 1924.—"Improvements in Shutters for Photographic Cameras." J. F. THORNTON and E. PICKARD.—*Dated February*, 1895.

No. 1950.—"Improvements in Apparatus for Developing Photographic Plates in Daylight." Communicated by F. O. Graf. Complete specification. E. EDWARDS.—*Dated February*, 1895.

No. 1998.—"Improvements in Whirling Machines for Photographic and Other Purposes." P. HYLAND.—*Dated February*, 1895.

No. 2305.—"Improvements in Photo-chromoscopes and Photo-chromoscope Cameras." F. E. IVES.—*Dated February*, 1895.

No. 2333.—"Improvements in Apparatus for the Use of the Electric Light for Photographic Purposes." Complete specification. A. G. ADAMSON.—*Dated February*, 1895.

No. 2363.—"Improvements in or Relating to Printing Frames." A. H. PETIT.—*Dated February*, 1895.

PATENTS COMPLETED.

Improvements in Instruments for Calculating Photographic Exposures.

No. 3701. Richard Whitehorne Savage, 17, Eldon-place, Leeds, Yorkshire.—*December* 29, 1894.

My invention relates to an improved form of instrument for calculating photographic exposures, made of a compact size and shape for carrying conveniently in the vest pocket.

In instruments where the scales are placed longitudinally they are of an excessive length, and, where the scales are on circular rings, their range is limited, except the diameter of the instrument be increased to an inconvenient size.

To improve upon these, I make my instrument—of ivory, bone, celluloid, or other composite substances, but preferably of metal—in the form of a pencil case, with a main tube, hereinafter called the first, of small diameter and of suitable length, having five other tubes, respectively called the second, third, fourth, fifth, and sixth tubes, fitting loosely upon the first tube, one over the other, in the above order, and each shorter than the one immediately beneath it, and of sufficient diameter to move easily.

These five (second to sixth inclusive) superimposed tubes, the second of about half the length of the first tube, are so arranged that they, except the sixth and outer, have each one end visible, and fitted with a narrow milled ring, and the other end under the tube above, the whole of the covered ends lying together at one end, called the left, of the first tube.

The sixth and outer tube has its whole length visible, one end with a milled ring as before, and the other secured by suitable means to the left end of the first tube, leaving the intermediate tube free to move when actuated by the milled rings.

Around the first tube I form a narrow continuous spiral groove, and upon the outer surfaces of the four following tubes are similar spiral grooves or indents, showing as spiral ridges internally, corresponding in pitch to the grooves upon the first tube, each internal ridge fitting into the groove on the tube immediately beneath it.

Instead of a spiral groove upon the first tube, it may have a spiral ridge; then the grooves and ridges upon the shorter tubes would be reversed, to ridge externally and groove internally.

The movement of the tubes would be the same in either case, the object being to give the surface of each a spiral motion to right or left as the tubes are moved by the milled rings.

Upon the first and four following tubes I place etched or engraved scales, the figured divisions following the spiral spaces between the grooves or ridges.

These five scales are well known to, and used by, photographers for calculating the correct exposure with the help of an actinometer for testing the light.

By marking or placing the scales spirally round the tubes, I am enabled to have a large number of divisions, giving a great range to each scale without making the instrument of great length or inconveniently bulky.

But as some of the scales are only of a short length, with a few divisions, I do not confine myself to placing all of them spirally; one, preferably the outer, may be arranged longitudinally, parallel to the axis of the pencil, and in this case moving longitudinally, whilst the remainder would move spirally, as before described.

The scale on the first tube is for the "exposure," on the second for the "stop" or "diaphragm," on the third for the "speed of plate," on the fourth for the "subject," and on the fifth for the "actinic intensity of the light" as found by the actinometer in the usual way.

Any other order may be adopted for the intermediate scales, or a less or greater number may be used, the working being the same.

Marked upon the outer and ringed ends of the second, third, fourth, fifth, and sixth tubes are pointers, each with a word or letter descriptive of and pointing to the divisions of the scales on the tube next below it.

Each scale is moved by the milled rings till the several pointers are opposite the selected numbers on each scale, the number upon the scale on the first tube indicating the requisite exposure.

In the above movements the result of turning the several tubes causes the scales to move spirally, one over the other, and to the right or left as required. To prevent the intermediate tubes moving too far on each other to the right, and thereby concealing or covering the marked pointers, I place or work a small pin or projection on each tube.

Instead of the scales being etched or engraved upon the surfaces of the tubes, they may be more economically stamped or marked upon flat strips of metal, and then wound in a tubular form, with an open spiral slit left between the edges of the strip, secured and strengthened at one end with a milled ring, as before described.

The first tube would then have upon its surface a deep spiral ridge or thread as a guide for the slits on the succeeding spiral strips to work on, governing their motion as previously described in the case of the tubes.

The position of the pointer marked "light" upon the sixth or outer tube, relative to the position of the numbers on the "exposure" scale on the first tube, depends upon the standard of light selected, and the above pointer and scale, or their equivalents, are usually so fixed that the instrument is only capable of being used with one standard of light.

The sixth and first tubes may be fixed together for one standard of light, or, preferably, the connexion may be made adjustable by slots, or notches, or other suitable means, so that their relative positions can be readily altered, according to the particular standard of light adapted.

I arrange the larger and left end of the instrument as an actinometer, the first or inner tube carrying a strip of paper sensitive to and darkening under the action of light in the usual way.

A movable cap is fitted with a coloured piece of paper, either all of one tint or half of its surface of twice the depth of tint of the other. The former or darker I call the "full" tint, the latter the "half" tint.

In the centre of the coloured paper is a small opening, preferably circular or oval, half of its area lying in one tint and half in the other.

The sensitive strip of paper is exposed through this opening, a fresh portion being drawn out as required in the usual way, the time taken to darken it to the depth of either tint as selected being noted.

The "full" tint is used under ordinary circumstances, the "half" tint when the light is feeble, to save time. In the latter case the exposure number is doubled.

At the right hand of the instrument, and fitted into the first or inner tube, I place a pencil, or pencil tube, or combined pen and pencil fitting, either to draw or screw out in the usual way.

What is claimed is:—1. An improved instrument for calculating photographic exposures, consisting of the combination of a set of scales, all moving spirally, or part moving spirally and part longitudinally, an actinometer, and a pencil case, with pen or pencil or both. 2. The combination in an instrument for calculating photographic exposures of movable scales, and the means of readily adjusting or altering the relative positions of one or more scales to the others, so that the instrument can be used with different "standards" of light or "speed" numbers.

Improvements in the Manufacture of Sensitive Plates and Films for Photographic Purposes.

No. 4006. Florence Alice Pettitt, 46, Fleet-street, Torquay, Devonshire. *January* 5, 1895.

This invention has reference to the manufacture of sensitive plates and films for photographic purposes, and its object is to prevent or diminish halation (local over-exposure) and solarisation (reversal of the image by over-exposure).

The invention consists in the interposition between the sensitive emulsion and the glass plate, film, or other support, of a substratum or coating containing a fluorescent substance, such, for example, as quinine or cinchonia, which is non-actinic, because, although colourless, it possesses the power of lowering the refrangibility of certain rays of the spectrum. Substances possessing this power are generally termed fluorescent.

In carrying out the invention, the plate or film is coated with a non-sensitive substratum or coating of gelatine, collodion, albumen, or other suitable vehicle, with which quinine, or other fluorescent substance, has been thoroughly incorporated, so as to render the substratum or coating non-actinic. The vehicle preferably used for the purpose is gelatine of the same physical character as that employed in the preparation of the sensitive emulsion used on the plate or film. When this non-actinic, or non-sensitive substratum has become thoroughly set and dry, it is coated with an emulsion of any required sensitiveness.

After the exposure of the plate, the non-actinic property of the fluorescent substance is destroyed by the subsequent processes of development and fixation; also the simple action of washing removes the substance from the substratum.

The manner in which the non-actinic, non-sensitive substratum or coating is preferably prepared is as follows:—

Dissolve one part of sulphate of quinine (medicinal quinine) in ten parts of water or spirit which has been acidulated with sulphuric acid. Then in this solution dissove gelatine by the application of heat, the proportion of gelatine being more or less, according to the thickness of the coating it is desired to obtain. The glass plate or film is coated with this gelatine and quinine solution, and, when this has become dry or set, it is coated with the sensitive emulsion.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim is:—1. In the manufacture of sensitive plates or films the interposition between the sensitive emulsion and the plate or other support of a colourless non-actinic, non-sensitive substratum, substantially as and for the purpose described. 2. The photographic plate or film, substantially as described, in which a substratum containing quinine or cinchonia is interposed between the sensitive emulsion and the plate or other support.

News and Notes.

Royal Photographic Society.—February 12, Annual General Meeting, and *Packham's New Process of Treating Platinotypes*, at 8 p.m., at 50, Great Russell-street.

Novelist's Chemistry.—We have occasionally had occasion to twit contemporary novelists with striking and sometimes amusing ignorance of anatomy and physiology. Their chemistry is not always above suspicion; witness the late Mr. Florence, who makes prussic acid play a lethal *rôle* in one of his stories, the acid in question having been stolen from one of the "carboys standing at the door of the drug store." In one of the Christmas stories the detection of the murderer was contributed to by a witness having accidentally "caught a whiff of the strychnine" on applying his nose to the bottle. Sharp nose that!—*Medical Press.*

National Association of Professional Photographers.—A Council Meeting will be held at the Imperial Hotel, Briggate, Leeds, on Thursday, February 14, 1895. Chair to be taken at 5 p.m., by Mr. T. Fall (London), President. All members of this Association will be heartily welcome at the Council Meeting. Annual Meeting same place, same day. Chair to be taken at 6 p.m. Special business: To consider a recommendation from the Council for reconstituting the Association upon new lines, and with a view to holding an annual meeting of members of the profession. Annual Dinner, 7 p.m. Tickets, 3*s.* each. Members intending to be present are specially requested to send names as soon as possible to D. J. O'Neill, Secretary, 47, Charlotte-road, Birmingham.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
11	Camera Club	*A Simplified and Improved Form of Photographic Lens.* H. Dennis Taylor.
11	Ireland	Opening of Exhibition.
11	Lantern Society	
11	Norfolk and Norwich	
11	North Middlesex	
11	Putney	
11	Richmond	
12	Birmingham Photo. Society	
12	Brixton and Clapham	*Simple Subjects and their Treatment.* W. Thomas.
12	Hackney	*How to Work the Lantern.* A. Rose.
12–16	Ireland	Annual Exhibition.
12	Manchester Amateur	
12	Newcastle-on-Tyne & N. Counties	
12	Paisley	
12	Rochester	
12	Royal Photographic Society	Annual General Meeting.—*Packham's New Process of Treating Platinotypes.*
12	Stockton	
13	Ashton-under-Lyne	Exhibition of Prize Slides.
13	Croydon Camera Club	Fifth Annual Meeting.—Exhibition of Sea and Snow Scenery.
13	Ipswich and Suffolk	
13	Leytonstone	
13	Midland	*Platinotype Printing.* R. J. Bailey.
13	Photographic Club	Ladies' Night.
13	Stockport	
14	Birkenhead Photo. Asso.	
14	Camera Club	
14	Cheltenham	
14	Dublin Y.M.C.A. Camera Club	*Some Snap-shots from Across the Atlantic.* Arthur Newsom.
14	Ealing	*Shutter-speed Testing.* H. W. Peal.
14	Glossop Dale	
14	Hull	
14	Leicester and Leicestershire	
14	Leigh	Demonstration of *Enlarging.* R. Leigh.
14	Liverpool Amateur	*Trip to the Austrian Tyrol.* Paul Lange.
14	London and Provincial	*The Far East.* R. P. Drage.
14	Manchester Photo. Society	
14	Oldham	
14	Southport	*Wild Animals.* Gambier Bolton.
14	West London	*Through the Highlands with a Camera.* H. Selby and G. Lamley.
14	Woolwich Photo. Society	Demonstration by the Platinotype Co.
15	Cardiff	
15	Croydon Microscopical	
15	Holborn	
15	Leamington	
15	Maidstone	
15	North Kent	
16	Halifax Camera Club	Prize Slides.
16	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JANUARY 31.—Mr. E. J. Wall in the chair.

Mr. W. T. Wilkinson presented to the library a copy of Hennah's *Collodion Process*, 1855, and the *Year Book* for 1866.

The HON. SECRETARY read a paper by W. K. Burton on *Photo-Mechanical Work in Japan.*

Mr. W. E. DEBENHAM understood Mr. Burton to desire particularly a discussion on the action of the lined screen. He thought a consideration of parallax would help matters. The source of light (the opening of the diaphragm) being so much larger than the width of the lines on the screen, the light from different parts of the diaphragm would pass through at different angles, and at a certain distance of the plate no part of it would be without illumination, although the point opposite the centre of the clear spaces would receive most light, which would gradually fall off penumbra fashion, to the points opposite the crosses where the action would be least. Where a strong light passed through, the light at the weakest place might still be strong enough to produce a continuous, or nearly continuous, deposit, whilst, in the deep shades, only the centre of the spaces would show deposit, and there would only be small points, whilst half-tones would be represented by dots of intermediate size. This explanation was illustrated by diagrams on the blackboard,

Mr. W. GAMBLE stated that the holes in the screen acted as a series of pinholes, and formed images of the diaphragm.

Mr. WILKINSON stated that the shape of the stop made no difference whatever, the size of it was the all-important point.

Mr. H. CALMELS referred to the use of an elongated stop, somewhat like a shuttle, when, he stated, an elongated dot would be obtained.

Mr. H. SNOWDEN WARD suggested that the dots were the shadows of dots of the screen, and that the same shaped dot could be obtained in the shadows with sufficiently long exposures as could be obtained in the high lights with a short exposure.

The CHAIRMAN read the following extract from a paper by Mr. F. E. Ives, delivered before the Camera Club: "The true function of a properly spaced and distanced cross-line screen is to produce on the sensitive plate a series of pinhole images of the aperture of the lens diaphragm, at the same time that the rays passing through reach the sensitive plate at the same points and define the same details as when the screen is absent. There is a distance of screen from sensitive plate at which the character of the pinhole image is best for our purpose, and when this distance is found the size and shape of the image can be regulated at will by change in the size and shape of the diaphragm aperture. If we use a diaphragm having a long and narrow aperture running in the direction of one of the lines of the screen, the resulting negative, owing to the pinhole image overlapping only or chiefly in one direction, will have either a single smoothly graduated continuous line, or a line continuous through the middle shade, and dotted at both ends of the scale, or a cross-line tint with one line more pronounced than the other, according to the length, width, or shape of the diaphragm aperture." Several passages from a German work were also quoted.

Mr. EVERITT stated that he did not think what had been said was sufficient to account for all, there was no room for the question of tone; and after further remarks the discussion was adjourned to the first Open Night, several members in the meantime promised to experiment and bring up their results, and it was suggested also that the action of a cross-lined screen could be determined by lantern experiments.

A very hearty vote of thanks was unanimously accorded to Mr. W. K. Burton for his paper and the exquisite specimens he had forwarded. He was unanimously elected an honorary member of the Association.

PHOTOGRAPHIC CLUB.

JANUARY 30,—Mr. R. Child Bayley in the chair.

It was proposed by Mr. HAES, seconded by Mr. FOXLEE, and carried unanimously, that a vote of thanks be passed to Mr. Bedding for editing the Club's proceedings, 1894.

Mr. E. A. Golledge was unanimously elected a member.

This being the third Travellers' Night of the season, the evening was devoted to *A Visit to Norway*, illustrated with pictures by Messrs. Bridge and Bridgeman. Mr. BRIDGE read a short descriptive paper, which he supplemented with characteristic remarks. The evening was a record one in more ways than one—the photography was excellent, the collection of slides (180 in all) one of the finest, whilst the audience was one of the largest. Mr. Bridge regretted here and there that he could not import a joke. A visit to Norway was quite different to a visit to the Emerald Isle. The Irish were noted for keen wit, which in many places seemed to ooze out of them. On the other hand, there was nothing frivolous about the Norwegians—they took their pleasures even more sadly than the average Britisher. As an instance, attention may be called to one or two wedding parties photographed by Mr. Bridgeman. It would be difficult to conceive more depressing sights than those. The absence of levity was, however, more than counterbalanced by the grandeur of one's surroundings. Mr. Bridge paid a high compliment to the people of a delightful country. He said they were interesting in their habits, thoroughly hospitable, and everywhere most reasonable in their charges. He looked forward to paying yet another visit to Norway, and recommended others to take another lease of life by doing likewise.

The present occasion was so well occupied by the lantern show that an equally interesting collection of stereoscopic slides had to be held over for another meeting.

At the conclusion a most hearty vote of thanks was passed to the gentlemen who had afforded so much pleasure to their fellow-members.

Croydon Camera Club.—The twentieth public Lantern Show was held on Wednesday week. Mr. BELLIN, F.R.G.S., exhibited a most interesting series of about 100 views on the Continent, mainly Italian. His accompanying description indicated that he was unusually familiar with a large store of historical and anecdotal lore, suggested by his slides. How great a privilege was his lecture may be gathered from the statement made by the President, that Mr. Bellin had refused invitations to lecture before the London Camera Club and also the Royal Photographic Society; nevertheless, although still suffering from a painful accident which happened on the previous evening, and which necessitated his ankle being supported by a surgical bandage, he placed his services freely at the Club's disposal, and was not only listened to with the greatest attention, but received very flattering testimony of appreciation at the termination of his remarks. The music, under the direction of Miss Eveline Atkinson, gave the greatest of satisfaction. The members' slides included a connected series illustrating a ramble from Croydon to Gatton, contributed by the President and Messrs. Corden, J. Smith, J. Noaks, and J. Noaks, jun., in which many attractive and curious objects and scenes of local interest were depicted, notably the old, now derelict, railway, which, running from Croydon over the Merstham Hill, is a delightful rambling ground for the naturalist or the cameraist. Following the above were shown some very creditable views by Messrs. S. H. Wratten (of which *Ould Mike* and *A Guinea a Set* best pleased) and H. E. Holland, as well as a number of studies of circus life and wild beasts by Messrs. Noaks and Smith, which were evidently much appreciated, many of which fully deserved the applause they received.

Ealing Photographic Society.—January 31, Mr. H. W. Peal in the chair.—Mr. A. ERNEST SMITH gave a most interesting lecture-demonstration on *Photogravures and How they are Made.* The lecturer started by showing the kind of negative required, and explained the process of making positives or carbon transparencies, mentioning, among other things, that a carbon transparency would be much strengthened by staining with permanganate of potash (Condy's fluid). Proceeding next to the copper plate, he said that the plate used should be hard (cost about 2*s.* 6*d.* per pound). It should be well polished and chemically cleaned, any tarnish being removed with a very dilute solution of nitric acid. A little of this mixture should be rubbed on to remove grease (finely washed whiting and water to form a paste, and a little liquid ammonia added). When quite free from gum, &c., it is ready for graining. This is done by aid of a graining box, containing powdered bitumen. This process was carefully explained; the reason why it is done shown by aid of a plate, only half of which had been grained, the ungrained portion not holding the ink at all. The different grains for different subjects were also considered. The plate, having been grained, is now ready for what

is technically known as the resist. This is the name given to the negative gelatine image, which is developed on the copper, and through which the etching fluid has to pass to give us our etched plate. A safe edge is placed on the transparency, and a piece of standard brown carbon tissue is exposed for the required number of tints. It is taken out of the frame and brought into contact with the grained copper plate under water, carefully squeegeed, and then developed with warm water until all the soluble gelatine is washed out; it is then placed on one side to dry. When dry the margin and back are protected with Brunswick black or Bates's black varnish, and the plate is ready for etching. Any little transparent spots on the copper are spotted out. The baths used for etching are different strengths of perchloride of iron, generally 40, 38, 36, 34, 33, 32, 30, per cent. This is best made up as a saturated solution and diluted down, the desired strength being found by means of a Beaumé hydrometer. These baths must on no account be too acid, otherwise blemishes will arise, notably "pits and stars." A little hydrate of iron mixed with the baths will rectify this. You should first begin with the strongest bath, and gradually work down to the weaker ones, the strongest having the least penetrating power. Two minutes in each bath is generally sufficient, and the etching should be finished in about ten minutes. Do not allow it to stop in any one bath too long, or hardness will result. When finished, place under tap, rub over with whiting, and clean with turps and benzole or benzoline. The lecturer then explained the printing process, and also retouching, cutting, and bevelling, and polishing over, and also the steel-facing process. The meeting closed with a most hearty vote of thanks to Mr. Smith.

Hackney Photographic Society.—January 29, Mr. J. Gardner presiding.—The feature of the evening was a lantern lecture, given jointly by Mr. and Mrs. SNOWDEN WARD. Mrs. Ward showed and explained some good views of English and Irish scenery, and Mr. Ward exhibited and described a fine series of views of places and things connected with the life of Shakespeare in and around Stratford-on-Avon.

North Middlesex Photographic Society.—January 28, the President (Mr. J. W. Marchant) in the chair.—Mr. W. THOMAS of the Brixton and Clapham Photographic Society read a paper, the subject being *Notes on Pictorial Work with the Hand Camera.* He throughout treated his subject in a masterly manner, and gave to the members knowledge of the utmost value. In the course of his paper he mentioned that practising photography by means of a camera carried and used in the hands has of recent years assumed widespread proportions. This is possibly so from the numerous advertisements almost daily appearing, announcing the introduction of new cameras of one kind and another containing features hitherto absent from those on the market, so much so that one is led to believe that the demand for them must be almost endless. Yet, judging from the exhibitions, the proportion of successful hand camera pictures appears much smaller than they should be. Mr. Roland Briant, in his paper on arrested movement and a living pose, made some very stringent remarks respecting hand cameras which, personally, I cannot agree with—a hand camera is what it is and no more. When used skilfully it offers a ready means under suitable conditions of securing a varied class of work, marine, landscape, or figure, of a standard equal to that produced by working with a stand camera, and, further, opening up opportunities that with a tripod and its accompaniments are as a closed book to the bulk of amateurs. I do not agree with the student commencing with a hand camera, let him start with a tripod camera, a plate of ordinary speed, leaving the science of exposure in relation to development, and of development in relation to exposure, until he has mastered the use of the ordinary camera. Let him study the methods of making pictures out of simple material, and of thinking out such pictures quickly. Then, and not till then, is the time to use a hand camera. A camera of this description is a very simple affair, let it have a good lens, two first-class finders, either magazine or slides, a focussing scale, and a reliable shutter, that being, in my mind, all that is required. Passing from the apparatus to its use, it is invariably found that the first few exposures (made even by expert workers with camera stands) are somewhat deceptive. This seemingly lightning method of securing pictures being found to call for a different method of working: what is required is a ready perception, a cool head, and a steady hand, qualities not given to every one in the same degree. In the first place, whatever form of hand camera may be adopted, commence by making yourself practically acquainted with its working. Paying just enough, but not too much, attention to the dealer's description of its virtues, which probably would lead to a belief that all left after paying for it is to press a button or touch a spring, and, forsooth, a pictorial wonder had been created, before which the hitherto marvels of the world's best painters would sink into deserved insignificance. Don't believe it. There is no royal road to pictorial photography, open alike, thank Heaven, to rich and poor, placing all on the same level. As to the choice of subject, that depends upon individual taste. Suppose you delight in forest scenery, with its deep, mysterious shadows, then this fashion of working will be quite out of date and useless. Should, however, you incline to the open plains, dotted with sheep and cattle, here we may succeed; or, again, on the sea or river, we may be called upon to exercise our craft under conditions pre-eminently suitable. Exposure—one of the supposed chief difficulties in this class of work—is it so very difficult, after all? Use a good rapid plate, lens covering at a large aperture. Learn the *technique* of photography thoroughly; use common sense in the choice of subjects, and this difficulty will decrease, if not evaporate entirely. The development of plates exposed in the hand camera calls for little remark. If you have succeeded in giving a full exposure, there should be no need for especial treatment other than that demanded by any delicate, highly sensitive plate. Should, however, the exposure have been none too much for the darker portions, our first care must be to keep the density from filling up and clogging the lights, a very good developer for this class of work being rodinal—a developer many complain will not yield printing density. This, however, has not been the case in my hands, and, providing the exposure has been anything like sufficient, it will give clean, good negatives of a nice grey colour, and quick printers. At the close of Mr. Thomas's paper, he handed round a selection of hand-camera work, which was greatly admired. In the discussion which followed the conclusion of the paper Messrs. Stewart, Johnson, Wall, Goodwin, Staveley, Spencer, Beadle, Forest, and several others took part. A very hearty vote of thanks to Mr. Thomas concluded the evening's business.

FEBRUARY 4.—Informal meeting, Mr. F. W. Cox chairman.—A uranium-toned bromide print was shown, upon which iridescent metallic markings had subsequently appeared in the deeper parts, and which had been removed eighteen months ago by rubbing with ink-eraser, no return of the defect being apparent. The CHAIRMAN read a paper on *The Reduction of Platinotype Prints by Aqua Regia* [see page 88], illustrated by examples. The remainder of the evening was spent in discussing, in a conversational manner, the paper in question, the use of yellow screens in landscape work, and actinometers for carbon printing.

Hastings and St. Leonards Photographic Society.—January 29, Mr. G. G. Gray, LL.D., presiding. For the occasion, Mr. A. Brooker, one of the hon. secs., had made a levy of lantern slides from some of the best-known and most successful workers in the country, amongst them being slides from Mrs. S. F. Clarke, who has just secured the first prize of 20*l.* in the *Graphic* competition, Messrs. George Hankins, J. H. Gear, Carpenter, Taverner, T. C. Hepworth, Job, Coulthurst, and F. Dunsterville. In showing the slides on the screen, Mr. Brooker suggested that such good work should be a stimulus to all the members to be up and doing during the year. He made an appeal to all members to put on their thickest photographic boots and endeavour to leave photographic footprints. After the slides had been duly shown and appreciated, the passing of the accounts and election of officials for the current year took place. The Rev. A. B. Cotton was unanimously elected president for the year, and the names of Dr. Gilder and Councillor Tuppenney were added to the list of vice-presidents; with these additions the officials holding office last year were re-elected.

Liverpool Amateur Photographic Association.—January 31, Mr. George B. Newton (President) in the chair. Five candidates were elected members of the Association. The gold, silver, and bronze medals gained at the recent Annual Competition were distributed to the successful competitors. The principal feature of the evening was a lantern lecture by Dr. J. W. ELLIS, F.E.S., entitled, *The Avon and Shakespeare Country.* About 120 very pretty slides of a most interesting and chiefly historical character were shown on the screen, the negatives of which were taken by the lecturer during the summer of 1894.

Llandudno Camera Club.—January 31.—There was inaugurated a series o, papers intended to deal with the various aspects of the amateur's experiencese and before a good muster of members Mr. WHISTON (Principal of the Collegiatl School) gave a paper on *Exposure.* The remarks were eminently practica, and came of long experience, as the writer had commenced in the old wet-plate days. Dividing his subject into three heads, Mr. Whiston dealt first with the plate used. I. He advocated two kinds of plate, having himself proved the advantages of Thomas's "thickly coated landscape" for ordinary work, and Cadett's "lightning" for instantaneous work. As a developer he strongly advised Cadett's pyro-soda. While condemning the practice of having a number of brands of plates in use, he disclosed his intention of trying the Ilford medium isochromatic during the coming season, as he believed that with a coloured screen they possessed great advantages, and the Sandell "general" had already proved themselves invaluable for difficult interiors, glens, streets, groups, &c., where there were strong contrasts. II. The Diaphragm.—After explaining the method of finding the focal value of any stop, Mr. Whiston showed how necessary it was that at all times a man should prove this value, especially with cheap lenses, and when copying, as here, the value of the stop varies, and so materially affects the exposure required. On the use of stops some principles involved were referred to, and the great tendency of the abuse of stops amongst beginners was plainly pointed out. *F*-16, or at the most *f*-22, was recommended for landscape work where there was decidedly a principal object. Summarising the use of the diaphragm, it was shown to affect (*a*) the artistic merit of the picture, (*b*) the duration of the exposure. III. The light of the screen was affected by (*a*) the time of year and hour of the day. Professor Scott's tables were quoted as showing the comparative and varying intensity of the light. The writer had found that, directly twelve o'clock was turned, the actinic power of the light declined. He found it best from 11.30 to 12, and, although practically the light was usually equal (barring interference of clouds) at the same interval before and after twelve, yet, for brilliancy, he preferred the morning light for careful work. Contrasting the effects produced by a leaden sky and a blue sky, a clear or a hazy atmosphere, an actinic, and the yellowish effect of the winter's sun, beginners were strongly advised to make careful observations, even to the extent of—

"When the wind is in the east
Give double the exposure at least."

As to the power of a yellow screen in diminishing the misty effect of bluish atmosphere, the members were recommended to experiment for themselves. (*b*) The subject, and circumstances under which it is taken. The orthodox divisions seemed to be: (1) Sky and marine; (2) open landscape; (3) ditto, with foreground; (4) near objects, buildings, and groups; (5) interiors. As to No. 2, it was not advisable to have the sun fully on the view, or the resulting picture would lack contrast; but, if it were "Hobson's choice," a short exposure was recommended. For No. 3 prolonged exposure was necessary for the foreground, and the writer was extremely sorry to hear that Place's shutter was no longer on the market. He had used this shutter for the past seven years, and used it regularly in stereo or instantaneous work. Another great advantage of the shutter was that it could be used on the slant, or even sideways, for unevenly lighted glens and streets, also groups, &c., and, of all others, this allowed the artist to "expose for the shadows" while taking care of the high lights. As to interiors, the subject was so difficult to deal with in a paper that it was recommended that an evening be devoted to interiors, illustrated with results shown in the lantern. In conclusion, a few hints were given: To gauge the exposure, fasten a weight (keys, knife, &c.) to a string forty-four inches long, and allow it to swing. In using an actinometer, such as Watkins' or Wynne's, allow the light to fall on it from the same quarter

it shines on the object. Pack exposed plates *en bloc*, but be careful there is no dust between. When *en tour*, number each exposed plate as a guide in development; the lead-pencil mark is also visible after development. Rule for finding at what distances all objects are in focus for any lens and diaphragm: Multiply 2·7 by the square of the focal length of the lens, and then by the diaphragm, giving the answer in yards; *e.g.*, six-inch focus lens, stop *f*-8, yields: $2{\cdot}7\times6\times6\times f\text{-}8=12$ yards. In taking interiors stop down to *f*-32, or *f*-45 if there are people moving about. Backed plates are great safeguards against halation. The Ilford exposure meter (kindly lent by the Britannia Works Company) was exhibited, and Mr. Whiston demonstrated its use. He referred to several tests to which it had been put, and it has proved itself a very reliable instrument. There was a Wynne's meter shown, also several exposure books, containing particulars of some hundreds of exposures made during the last seven years. Several questions were put, and the discussion was free. At the conclusion of the paper a hearty vote of thanks was accorded, on the motion of Mr. WATTERSON, seconded by Mr. DEAN.

Plymouth.—A new Club has just been formed at Plymouth. Not a bit too soon either, for, for lack of one, Plymouth amateurs have been obliged to journey to Devonport to join the popular Club there. Twenty members joined at the initial meeting, which was held at the Mechanics' Institute, at which place the meetings will be held fortnightly. The membership subscription is 5*s.*, and the Hon. Secretary is Mr. R. Rugg Monk, 25, Torrington-place, Plymouth.

Widnes Photographic Society.—January 30, Mr. V. C. Driffield in the chair.—Mr. J. NEWBURN read a paper, entitled *Selecting the Picture in Landscape and Portrait*, in which, by the aid of a series of good, bad, and indifferent lantern slides, he very ably made manifest the position which should be occupied by each subject on a plate, in order to obtain the best possible picture out of the materials contained thereon.

FORTHCOMING EXHIBITIONS.

1895.	
February 8	*Bournemouth Photographic Society. Hon. Secretary, E. Greenleaves, Priory Mansions, Bath-road, Bournemouth.
,, 12–16.....	Photographic Society of Ireland.
March 25–30	*Brixton and Clapham Camera Club. F. W. Levett, 11, Corrance-road, Brixton, S.W.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

SPLITTING FILMS.

To the EDITOR.

SIR,—We note your remarks in the last number of the "BRITISH JOURNAL" on this subject. Owing to the nature of the celluloid, the want of adhesion between it and the gelatine emulsion is one of the initial difficulties in the manufacture of films; this difficulty we have long since overcome, and we can hardly think that your remarks can fairly apply to films of our manufacture, except possibly a few of our earliest make. We enclose a packet of films of our present manufacture, and invite you to test the adherence between celluloid and emulsion by any means which may occur to you, short of mechanical violence such as scraping with a knife. Perhaps the severest test of all is to warm the films from the back; if they will stand this test without splitting, they may safely be relied upon under all ordinary conditions.—We are, yours, &c., B. J. EDWARDS & Co.

[The films will be tested on an early occasion.—ED.].

ALIEN SKIES.

To the EDITOR.

SIR,—In the article on "Alien Skies," in your issue of the 1st instant, Mr. Maclean speaks of "the power one has of suggesting distance by employing a lens to take skies which is of slightly longer focus (smaller angle) than the lens used for the landscape." Later on, he says: "If the clouds printed into a landscape be somewhat smaller than nature would make them, the resulting effect will be that in the first place the idea of distance or recedence will become considerably augmented," &c. These two statements are of course contradictory. Did Mr. Maclean really mean to recommend lenses of longer, or of shorter, focus?

WALTER G. ORME.

49, *Tettenhall-road, Wolverhampton, February* 2.

To the EDITOR.

SIR,—In the JOURNAL of yesterday, on page 70, bottom paragraph commencing, "Assuming that your negative," &c., I have read this paragraph half a dozen times, and shown it to two other photographers, but we cannot make head or tail of it. Can you explain it? Is the celluloid coated with emulsion? Would not the wet gelatine film adhere to the celluloid, and most probably get torn? But by no question can I hope to get an answer that will elucidate it. It is such a complex business.—I am, yours, &c., J. E.

February 2, 1895.

Perhaps Mr. Maclean will help our correspondents out of their troubles.—ED.]

SOLDERING ALUMINIUM.

To the EDITOR.

SIR,—Your description, in No. 1810, of Messrs. Bowen & Co.'s process for soldering aluminium suggests to me that your readers may be interested to know that aluminium may be readily soldered to itself or to other metals with block tin, or tin and silver, where a harder solder is desired. No flux is necessary, nor is it even needful to clean the surface of the aluminium as a preliminary. A small brush is made of aluminium or other wire fastened in a handle. The aluminium is heated with a bit of solder on it until the solder melts. The brush is then dipped into the drop of melted solder, which lies on the aluminium like a globule of mercury, and the surface of the aluminium beneath rubbed with the wires. This has the effect of removing mechanically the repellent film of oxide, the air being at the same time shut out by the melted solder, and the latter immediately adheres to the surface so cleaned. It is perfectly easy to spread the melted tin like paint over the surface of the aluminium, and two surfaces tinned in this way adhere, when pressed together and heated, so strongly that the aluminium will often give way before the joint can be separated.—I am, yours, &c.,

T. M. CLARK, *Treasurer, the Technical Company.*

22 *Congress-street, Boston, Mass., U.S.A., January* 21, 1895.

RELIABLE TESTING OF PLATE SENSITIVENESS.

To the EDITOR.

SIR,—It has often been said in the photographic press and at photographic meetings that, if a reliable system of speed-testing could be found, the value to the photographic world would be of immense importance. I think the time has arrived to state that a reliable system now exists. I have no intention of entering into any acrimonious discussion in this letter; there is a great deal too much of this sort of thing amongst photographic brethren.

After constantly using the Hurter & Driffield system for a period of two and a half years, I have been able to arrive at the reason of discrepancies in individual reading. I may state, however, that these reasons have been known to me for a very long time, but until some arrangement could be made with the inventors of this valuable system of speed-testing, nothing could be done to put the matter on a proper basis.

First of all, I would impress upon your readers the notable fact that all the scientific opponents of Messrs. Hurter & Driffield, nevertheless, use their system, or rather that portion of it which may be briefly stated to be the testing of the plate through several densities instead of one, no matter whether we read transparencies or densities, provided we draw a line through such densities as obey the correct law, which every one seems agreed upon, namely, that the opacities of a plate should be proportional to the light intensities that produced them, therefore all systems which accept speeds by reading through such densities as obey this law are theoretically the same as that employed by Messrs. Hurter & Driffield. This portion of their work has remained absolutely unshaken, but now we come to the important question of the development of those densities by which the speeds are obtained. It cannot now be questioned that the speed, and thereby the density ratios of the plate, are altered by modifications of the developers; this is now such an established fact that I do not think Messrs. Hurter & Driffield would contest the point in the future; nevertheless, this does not alter the value of their method of speed-testing. It is the only one in which the proper relation of density opacity to speed is considered and given its proper value. Unfortunately, those who use the Hurter & Driffield system have, up to date, used their own developers, with the natural result that the comparative readings are not the same. It is quite easy by developers to alter the speed of the plate, say, for argument's sake, 500 per cent. More than this can even be done, but such an alteration as here mentioned is quite within the limits of easy practice. It is not to be wondered at, therefore, that, however perfect the theoretical system of Messrs. Hurter & Driffield for speed testing, if individual users of the system use their own particular developers, it is quite clear that no comparatively reliable results can be obtained. Admitting, therefore, that speeds are alterable by development, the question naturally comes forward as to what standard developer should be used for individual comparison. Unfortunately, another matter complicates this question, and it is that the various plates behave differently with regard to different developers, and the plates which we might say would give a certain speed with a certain developer (ferrous oxalate) would not necessarily show the same alteration in speed

with a different kind of developer, which some other make of plates perhaps would. To meet this question, Messrs. Hurter & Driffield have now very fairly consented to permit two speed-numbers to be marked upon the boxes of plates, the one being the speed obtained by the standard ferrous oxalate developer, the other being the speed obtained by the formula for development recommended by the makers themselves as best suited to their manufacture, so that any one using an actinograph or exposure meter would use the number in practice agreeing with the formula for development used with the plates. This concession on the part of Messrs. Hurter & Driffield at once clears all trouble and difficulty, and we think this concession so important that I am anxious to lay the matter before your readers without delay.

After careful experiments, Messrs. Hurter & Driffield have settled upon a formula for ferrous-oxalate testing, which is as follows:—

A.	
Oxalate potash	1 part.
Water	4 parts.
B.	
Protosulphate of iron	1 part.
Citric acid	$\frac{1}{100}$,,
Water	3 parts.
C.	
Bromide potassium	1 part.
Water	100 parts.
For use take—	
Solution A	100 parts.
Solution B	25 ,,
Solution C	10 ,,

The plate should be fixed, without washing, in ordinary water, to prevent more lime stains than possible; then, after well washing, be placed for ten minutes in a two per cent. solution of hydrochloric acid, to thoroughly remove lime or any other stains that may occur, and then, finally, well washed. This developer is used for five minutes at a temperature of 65° Fahr.

Messrs. Hurter & Driffield have very kindly tested the new proposed Pentane-air-Argand of Mr. Dibdin, F.I.C., F.C.S., Chemist to the London County Council, and they have given us a value for this instrument as against the candle. They will later carefully revise their tests of this instrument, so as to get the mean of a good many tests. This will undoubtedly become the standard light of the country as soon as an unopposed Bill can be passed through Parliament, and I think that this light should be decided upon as the standard.

With regard to the speeds to be obtained by the formula of development recommended by the makers for their plates, this also, as far as we are personally concerned, is in the hands of Messrs. Hurter & Driffield, and they will themselves decide the difference in value of these developers, so that their real values can be stamped upon the boxes for the users. The whole trouble with regard to the marking of speeds has, as I have before said, simply rested upon the question of the alterability of speed of the developer. I have always recognised this point, and often mentioned it at various meetings that I have attended; but, now that this arrangement happily clears up all difficulties, there ought to be no further trouble.

The old argument of an artificial not being comparable to daylight for testing can be very well met; the difference of the quality of light given making no difference in comparative speed-testing, unless various plates differ in their orthochromatic quality; of course, comparative speed-testing with orthochromatic plates would not be possible by this method, but I am dealing here with the simple bromo-iodide plate of commerce, which seems to be fairly constant in its relative spectrum sensitiveness, and from many hundreds of tests it is unquestionably proved that for all practical purposes the speed of a plate can be sufficiently well defined to make exposure of negatives in the camera a practical certainty, using exposure meters.

I should much like if you could offer space in your paper for the discussion of this matter. I hope, however, if this discussion happen that it can be carried out in a kindly spirit, and without that bitter show of feeling which is too often the trouble amongst the photographic community in particular.

I may say that Messrs. Hurter & Driffield will from time to time exercise a check upon the readings sent out on boxes, and with their co-operation we trust that at a very near date plate users may have complete reliance upon the speed numbers they find upon the boxes.

Many will say, What about the speeds hitherto marked? have they been correct or not? As a matter of fact they have all been correct with the particular individual standard developers used for testing: this answers the whole trouble. As much harm has been done by people using so-called under-marked plates as over-marked; as a matter of fact, there can be no such thing as under-marking or over-marking by the Hurter & Driffield system, unless the developer used to develop the camera negative differs from that by which the plates were tested by the H. & D. system. It has been purely a matter of development all along which has been the cause of the trouble, otherwise the admirable system of Messrs. Hurter & Driffield would have received the credit it ought to have had.

I should be very pleased to explain the matter further to any of your readers who may not be satisfied with the statements I have here made.—I am, yours, &c., JAMES CADETT.

EXCHANGE PRINTS.

To the EDITOR.

SIR,—There are many amateur photographers who have their best negatives enlarged in carbon and platinotype, and there are probably a still greater number who are debarred from doing so by the wasteful method of producing and consequent high cost of the *first* print. Therefore, if means could be devised whereby duplicate copies could be disposed of, many amateurs would, no doubt, be glad to avail themselves thereof.

May I suggest that—either by the insertion of a list of names in your advertisement columns or some other way—those who are willing to exchange or sell duplicate copies of carbon and platinotype enlargements may be brought into communication, and by thus bringing the principle of co-operation into practice it will become possible to obtain three or four pictures at the cost of one.

In spite of the ingenuity displayed by many photographers in spoiling plates, there are few who do not, by a marvellous combination of miracles, produce, at least once in a lifetime, an artistic picture which would be a much more effective production when enlarged.

I shall be glad (with your permission) to have the opinions of others upon the subject.—I am, yours, &c. J. P. STEELE.

21, *Clive-street, Shelton, Stoke-on-Trent, January* 31, 1895.

NATURALISTIC PHOTOGRAPHY AND THE PROGRESS MEDAL.

To the EDITOR.

SIR,—How have the Rip Van Winkles been sleeping to so *dream* of Dr. Emerson's doings!

Some twelve years ago Dr. Emerson began to exhibit a new kind of photograph, and to teach by articles, reviews of exhibitions, private letters to individual workers, and personal conversations.

Forced, or, rather, hurried by the stupidity of critics, he, some six years later, published his theories of what he had practised, and of what he has never ceased to practice.

He then discerned some things he had written were not tenable, so he withdrew his book (*not his pictures*) *pour mieux sauter*, and, in March, 1893, before the then Photographic Society of Great Britain, he *revised* his book, stated distinctly what portions he discarded, what he retained, so that any one with a copy of that paper and *Naturalistic Photography* has before him Dr. Emerson's teachings *up to date*.

As in the case of all artists, Dr. Emerson's *pictures* must be studied, not so much as his theories, and his pictures have never altered or showed any change of practice, and it is the *pictures* that have made the revolution in pictorial photography.

Mr. Whistler wrote his book years after his pictures had done the work, and it is his *pictures* that will live—so with Dr. Emerson's.—I am, yours, &c., ALERT.

N. A. P. P. AND "COSMOS."

To the EDITOR.

SIR,—In reply to the good-humoured and kindly remarks by your contributor, "Cosmos," the free portrait scheme has been brought before our Council and members repeatedly in my reports, and these notices have appeared in the photographic press, including THE BRITISH JOURNAL OF PHOTOGRAPHY, our members on each occasion resolving that no specific action was possible on the part of the National Association of Professional Photographers short of legal proceedings, for which we had no funds—that the photographic profession thoroughly understood the matter; and, as for the "fools who are born every day," and who are gulled by the "portrait" and other swindles, the Association was powerless to influence them.

Our next Council meeting will be on Thursday, February 14, 1895, Imperial Hotel, Leeds, when I will submit for consideration a "bill" or "leaflet" for the use of members of the National Association of Professional Photographers; but our Council always doubted that there would be any practical result from any action, except from that of legal prosecution.

"Cosmos" styles our Association "a loftily named body." Will he kindly suggest any other words which will better express the same, and I will gladly submit them for consideration?

As to our "not having made any serious attempt to do anything for the photographic profession," well, if "Cosmos" had spent time, labour, and cash out of his own pocket, as so many members of the Association have done, and been present at our meetings, he would think and write differently.

I will not now intrude upon your space in a general defence of the National Association of Professional Photographers by replying to the jocular and serious allegations by "Cosmos," December 21, 1894, but I

may mention one case which "Cosmos" is evidently not aware of. A photographer year after year has been holding what he termed an annual prize drawing, notified to the town and district by flaring advertisements of various kinds, and even imprudently advertising. "Wanted, 100 boys, fourteen to fifteen years of age, to sell above tickets, Free tuition for two years at the National Studio" (name of firm omitted) "to the boy that will sell most tickets." As instructed by the Council of the National Association of Professional Photographers, I placed the matter before the Home Secretary, the Treasury, and the local authorities, the result being the smashing up of the entire affair, which was being extensively worked in that town and others adjacent.

The proprietor's next advertisement ran thus:—"In consequence of my having to withdraw the annual prize drawing," &c. Here follow some "startling offers" as to large quantities for small prices, and a modest reference to the "high standard" of this benevolent photographer's work.

At another time I may ask favour of space to give further instances in disproving our having "done nothing in particular." Meantime I trust we may have a good muster of members of the National Association of Professional Photographers on February 14 at the Imperial Hotel, Leeds. Council, five p.m.; general annual meeting, six p.m.; annual dinner, seven p.m. Tickets, 3*s.* each.—I am, yours, &c.,

D. J. O'NEILL, *Secretary.*

47, *Charlotte-road, Birmingham.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

JOHN CALVE.—The negative sent is an excellent one for the purpose.

H. B.—The "Tyke," of the maker, J. H. Spencer, 19, Mentone-place, Leeds.

N. TIBSLEY.—We refer you to the Polytechnic Photographic Institution, 309, Regent-street, W.

EXPERIMENT.—Bitumen, suitable for the dusting box, is kept ready powdered by Mawson & Swan, so also are the other things mentioned.

A WOULD-BE OPALINE WORKER.—We do not remember the edging used by the firm mentioned. But various kinds of paper, probably including that upon which information is desired, may be obtained of any of the dealers in bookbinders' materials.

STUART.—The sample of green material will do very well for the end blinds, so would a pale blue of the same material answer for the centre ones. We cannot say where it is to be had in your neighbourhood, but it may be obtained from all house-furnishers in large towns.

H. W. (Herts).—Country lanes, with snow if good, would make good subjects for Christmas and New Year's cards. Possibly you might make an arrangement with some of the producers of them to buy the negatives, or take prints from them. Try some of the wholesale houses. We cannot help you further.

A. SIMPKINS.—The finest wire gauze, even the most carefully selected pieces, will not answer so well as even an inferior ruled screen. Screens are necessarily expensive, but for good work they cannot be done without. For your initial experiments a small ruled screen would answer, and that is not a costly affair.

M. W. C.—You will certainly not be allowed to take a camera into the British Museum to photograph any of the objects there unless you have previously obtained permission. With that every facility will be given to do what you require. Permission is easily obtained. A letter addressed to the Trustees will meet with a courteous reply.

E. BENNET.—If the pyroxyline had been prepared according to the formula given in the ALMANAC, and the cotton was perfectly dry, it would not have been dissolved in the acids. The only and correct way of accounting for the solution is that the acids employed were not of the right strength (too weak), or that the temperature was beyond that given.

NORTHERNER.—If the light is yellow when taking snow-scenes, a decided advantage may be gained by using plates treated with eosine; but, if the light be clear and bright, no great gain is to be expected. Plates sensitised for the yellow rays, as with eosine, to an extent ignore yellow haze; but it must be borne in mind that in winter scenes atmosphere and a certain amount of haze is always present, and it should not be entirely ignored, or the effect would not be real.

W. BERRY.—If you read the article again you will see that a precipitate is thrown down. Why not follow the instructions throughout and then try the result? We cannot, of course, say if the emulsion you have prepared will work satisfactorily. It should be tried. It goes without saying that the pyroxyline you have received in the damp state must be dried before it is used.

S. J. B.—All the trouble has arisen from the cause surmised, namely, allowing the platinum paper to lie exposed to the air all night. Remedy: Get a fresh supply, and keep it carefully protected from the atmosphere and from moisture. It is no use protesting that the platinotype process is "a nuisance to work." It is a very simple process, but, as in all processes, certain conditions have to be fulfilled, and, unless they are, failure follows.

H. G. C. says: "I have a Daguerreotype to copy, and I find it impossible to get any satisfactory result, unless the bluish white stains with which it is covered in parts are removed. I remember reading in your paper some time since directions how to treat it, but cannot recollect exact solutions, and wish to run no risk with it, as it is valued."—The ordinary tarnish on a Daguerreotype is cleaned off with a solution of cyanide of potassium, then well washed, and afterwards rinsed with distilled water, and, finally, dried by heat. As our correspondent appears to have had no experience in this kind of work, he had better put the job into the hands of a photographer who is conversant with the Daguerreotype process, particularly as the picture is a valuable one. Many a valuable Daguerreotype has been inevitably ruined by unskilful treatment.

F. E. G. writes: "1. I have had a zinc box made with rack inside to hold two dozen negatives, and filled with hypo to fix same; but, after a few weeks' trial, I am dissatisfied with it owing to the solution becoming so turbid and dirty (although it has a good lid to keep out dust), and thereby marking and staining the negatives. I shall be glad to learn where the fault is. Ought the box to have been of some other material? 2. A few years ago I believe you recommended an acid fixing bath for negatives, but I am unable to find the article in back numbers."—1. The result is not at all surprising seeing that zinc is strongly acted upon by a solution of hyposulphite of soda. Earthenware grooved vessels are supplied at the photographic warehouses, which should be employed if ordinary dishes or dipping baths are objected to. 2. Add to the hyposulphite of soda twenty per cent. of acid sulphite of soda, with a little of the ordinary sulphite.

AMATEUR'S LENS (Birmingham).—To enable your landscape lens of six inches focus to become at will a lens of two and a half inches and other intermediate sizes up to eighteen inches, and not only so but to make it act also as a telephoto lens, is an achievement calculated to appal the heart of the stoutest optician. We will give you the following general answer: To *lengthen* the focus of such a lens, the formation of which we know nothing about, place in front a concave lens of suitable form and focus; to *shorten* the focus, employ in a similar way a convex lens of less than the focus of your present one; while, to convert it into a tele-photo lens, turn its convex side towards the object and mount, at a distance behind, a concave lens of greater negative power than the positive power possessed by the other, ascertaining the amount of separation by experiment and the study of the construction of an opera-glass. All this, we fear, will be beyond your power to accomplish with your present knowledge, and the kindest advice we can give is. Don't attempt it.

LAW-SUIT puts the following questions:—"1. When copying a picture for lantern slides, *i.e.*, making a negative and positive, to whom does the negative belong, supposing that it was not mentioned at the time the order was given, but was charged for? 2. If the operator or photographer makes a negative and positive from a drawing belonging to me, and afterwards supplies me with duplicate copies at one-eighth cost of first, will this be sufficient proof that the negative is my property? 3. Would the photographer, in selling his business, be allowed to sell my (?) negatives with his own? and, if so, can I recover same? 4. When writing to the photographer for the negatives, he wrote back saying he would not give them up, but would scratch them or destroy; this after having charged 2*s.* for making the first slide, and only 3*d.* for each duplicate."—In reply: 1. The negatives are the property of the photographer, unless a separate and distinct charge was made for them, in the same way that a portrait negative is his property. 2. No. 3. Yes, we presume so, the same as in the disposal of a portrait business. 4. This is a very fair and honourable offer if you have no property in the negatives, which seems to be the case. If you have a circular printed, you are not entitled to the type that was used for its production. 5. Gold is better than mercury for toning lantern slides.

*** Several answers unavoidably held over.

CONTENTS.

	Page
ACHROMATIC *VERSUS* SPECTACLE LENSES	81
COMPOSITE PHOTOGRAPHS	82
DEVELOPMENT OF PARTIALLY PRINTED PROOFS	82
JOTTINGS. By COSMOS	85
PHOTO-MECHANICAL WORK IN JAPAN. By W. K. BURTON	86
PHOTO-CHEMICAL NOTES. By G. E. BROWN, A.I.C.	88
THE REDUCTION OF PLATINOTYPE PRINTS BY NITRO-HYDROCHLORIC ACID. By FRED W. COX	88
SOME STUDIO BLINDS AND REFLECTORS. By EDWARD DUNMORE	89
COPYRIGHT IN PHOTOGRAPHS. By ERNEST J. RICHARDS	89
OUR EDITORIAL TABLE	90
RECENT PATENTS	90
NEWS AND NOTES	91
MEETINGS OF SOCIETIES	92
FORTHCOMING EXHIBITIONS	94
CORRESPONDENCE	94
ANSWERS TO CORRESPONDENTS	96

THE BRITISH

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ARTISTIC BACKGROUNDS IN PORTRAITURE.

There are, doubtless, many of our readers who remember a method of forming pictorial, or landscape, or other scenic backgrounds in portrait and group negatives originally suggested by Mr. John Werge.

Soon after this suggestion was made, we realised that numerous, nay, innumerable, photographers, both professional and amateur, more especially the latter, could not afford a great variety of high-class scenic backgrounds, such as would suit every requirement, but that no photographer was so poor or circumscribed in his means as not to be able to possess a few landscape negatives obtained during his leisure hours, either from nature, paintings, lithographs, or engravings. These negatives constitute a stock in trade which may be duplicated so as to be of the size of the plates on which portraits are to be taken.

Once in possession of a few well-selected subjects printed in the form of transparencies, the portrait photographer has an immense power at his command, for he can at his will apply to a portrait a scenic background of any character to which he may be disposed—indoor or outdoor, one in India, or in the garden adjoining, a summer scene, or one indicating the depths of winter, or perhaps, better, a favourite scene in his own locality, or that on which his sitters reside—thus adding the charming local recognition to artistic merit in his new departure.

The portrait negative to which such a scenic effect is to be applied ought, by preference, to be taken with a rather dark, plain background screen; but, in the course of some experiments we have made, we find this is by no means absolutely necessary. What *is* necessary, however, is that the already existing background in the portrait negative be cleared away, so as to be quite denuded of any silver deposit.

Happily this is not a difficult matter in the knowledge of so many solvents of the deposited metal capable of showing its presence when in the printing frame. There is no negative, however old it may be, which will stand the action of a rather strong solution of either iodine and cyanide of potassium or of ferridcyanide of potassium and hyposulphite of soda. This must be applied by means of a brush, special care being taken that none of the fluid is allowed to touch the figure itself. This may be prevented by mixing with the solvent fluid a little mucilage of gum arabic or analogous substance by which addition the solvent will not spread. After being washed and dried, the negative will print the figure with a black background.

But at this stage it is coated all over with the following preparation:—

Dextrine	1	drachm.
Sugar-candy	1	,,
Bichromate of ammonia	½	,,
Water	4	ounces.

This must be allowed to dry in a warm place, the limit to the heat being that degree at which the gelatine negative does not melt. If a collodion negative is operated on, the drying may take place by holding the negative over the flame of a spirit lamp or Bunsen burner.

As we have often said when writing on applications of the powder or dusting-on process, almost any of the numerous formulæ for preparing a sensitive fluid, which are to be found year after year in the Almanac, may be employed. Here is another which we have used with a degree of success equal to that just given:—

A.

White sugar	4	drachms.
Gum arabic	4	,,
Water	5	ounces.

B.

Bichromate of ammonia	½	ounce
Water	5	ounces.

Mix equal parts of A and B before using.

If the plate feels tacky, after being seemingly dry, it must be held before a fire for a few seconds until all tackiness disappears.

The scenic negative having been selected and suitably placed with regard to the portrait, the whole is now exposed to light, which may be either the direct light of the sun or that from the electric or limelight. If the first of these be accessible, it is probable that an exposure of half a minute will suffice; but this can be determined by one or two trials. It is now removed from the printing frame, and in a room moderately darkened the portrait negative is gone over with a large camel's-hair brush charged with finely powdered plumbago, which adheres to those parts that were shielded from the light, thus forming an artistic background to the portrait.

Care, taste, and a modicum of skill are required in order to the production of a really high-class result, and, of course, special care must be taken not to allow the blacklead brush to infringe upon the portrait itself.

THE SWING BACK IN PORTRAITURE.

Although the majority of cameras of modern make are provided with a swing back of some form, a large proportion of amateurs make very little use of it, even for ordinary outdoor work, while, amongst those who add portraiture to their routine of work, it is questionable whether one in twenty ever dreams of using the swing. Indeed, it is not very long since we heard an argument to the effect that the swing back as applied to a portrait camera was not only useless, but actually injurious, as leading to an increase of the distortion or exaggerated perspective naturally produced by the lens under certain circumstances.

In this connexion it may be remarked that it has been pointed out how, in employing the swing back for the restoration of the parallelism of the vertical lines in a photograph, when the camera is of necessity pointed in an upward direction, the displacement of the plane of delineation works favourably and in the direction of the removal of any distortion of the image produced by the tilting of the camera. Thus, in photographing a high tower with perpendicular walls, when the camera is tilted, the lines are made to converge instead of being parallel, as they should be, the upper portion of the tower being consequently narrower than the base; but, in throwing the lower portion of the plate further away from the lens, not only does that action restore the perpendicularity of the lines, but in doing so it brings the top of the tower to the same width as the base.

But, when the swing is used for a different purpose—and this is the use to which it is usually put in portraiture—the bringing into focus of objects at different distances from the lens, the case is quite different, and, as a matter of fact, objects close to the camera so brought into focus are still further exaggerated in size than would naturally be the case from that proximity. A familiar illustration of this is found in a street view, the camera being placed on the foot walk. With the back in its normal position, if the distance of the picture be in sharp focus, the houses at the side and close to the camera will be very much out; by utilising the side swing, and throwing that portion of the plate further away from the lens, the focal definition will be improved, but with the additional result, that the near objects are magnified beyond their natural dimensions.

When the swing back is employed in portraiture, it is practically invariably for the purpose of bringing into focus portions of the image which, from their position, will not fall into focus on the same plane as the rest of the picture, and it follows as an absolute necessity that, on securing definition, there must be a disarrangement of the correct proportions of the different parts of the subject. Here the most familiar instance that can be selected is the case of a sitting figure with the hands resting in the lap or on the knees of the subject. We all know that, under such circumstances, the hands will be more or less out of focus, and at the same time they will have a tendency, to put it in the mildest form, to show to the utmost advantage in the matter of size. If, now, the swing back be brought into use, and the upper portion of the plate swung back sufficiently to bring the hands into focus, then the size will be still further augmented; and with a short-focus lens, or with the camera pretty close to the sitter, as in the case of a half or three-quarter length, the degree of enlargement or distortion so produced may easily be carried beyond the bounds of caricature.

So far as these facts go, the contention that the swing back in portraiture leads to distortion is quite well founded, but it does not necessarily follow that it is either useless, or to be avoided. On the contrary, we hold that it is in the highest sense not only useful but necessary, an assertion in which we are borne out by the fact that all studio cameras of the best class are provided with at least a vertical, and, in many cases, also with a horizontal, swing. In using either of these it rests with the operator to exercise his skill in such a manner as to prevent the mechanical weaknesses of his instrument from intruding themselves in the picture; but the necessity for this can scarcely be said to exist in any stronger form when the swing back is used than when it is not.

Swing or no swing, no operator with any claim to skill in artistic posing would think of arranging a sitter in such a position that the hands or any other portion of the figure were palpably out of proportion; and the same amount of trouble that would suffice to avoid this danger in the absence of the swing back would also suffice when it is used. At the same time it must be borne in mind that no amount of artistic posing or arrangement, nor the most extreme care in selecting the point of view, will alter the optical properties of the lens to such a degree as to bring different portions of a figure at close quarters to the lens into sharp focus in the same plane. It is here that the value of the swing back comes in, due care being, of course, taken to avoid the defects already indicated.

It need not be supposed, however, that the swing back is an absolute necessity in portraiture any more than it is in landscape work, or that it can be used under all or any circumstances. What we contend is, that it is a useful power to have available, and with some kinds of portrait probably more generally useful than in any branch of pictorial work except architecture. Much, however, will depend on the class of picture, and much also on the character of the lens employed.

Thus, for full-length or three-quarter-length standing figures, there is little necessity to bring the swing back into use. The figure itself presents a practically plane surface to the camera, so far at least as its general outline goes, while the distance from the camera and the optical qualities of the lens necessary for the production of a full-length picture will ensure that the different portions are in sufficiently correct focus. But it is in the case of bust or half-length portraits that the chief difficulty in securing fairly uniform sharpness will be principally felt, more especially as this is the kind of portrait most frequently chosen by the amateur artist. In the execution of such pictures, the camera is necessarily closer to the sitter, which entails not only that the perspective is of a more pronounced character, but also that it is more difficult to bring the different planes of the subject into focus. Add to this that the general contour of the figure departs more from a perpendicular plane, and it will be seen that the treatment must necessarily differ from that of a full-length.

These differences will be still further modified by the lens employed. Broadly and generally, it may be said that the slower the lens, *i.e.*, the smaller its angular aperture, the less will be the difficulty in securing a generally even focus, and the less the necessity for the employment of the swing back. In other words, the smaller the stop and the greater the depth of focus, the more easily will the different portions of the subject be got into focus.

In many respects the best lens for portraiture for an amateur, looking rather at the general evenness of definition of the picture than rapidity of working, will be the ordinary

single landscape lens, worked with a tolerably large aperture, say about *f*-12; this, while covering the plate well, gives sufficiently good definition over a large area, without that excessive sharpness in any one portion that detracts so much from evenness of focus, and renders any want of depth more palpable. Lenses of the rapid-rectilinear type combine a greater degree of rapidity as well as greater crispness of definition with the qualities of the single lens, and, when used with the swing back, make the most perfect portrait lenses.

Yet it is with the portrait lens proper that the value of the swing back will be most conspicuously felt. These, from their extremely wide-angular aperture, possess in the smallest degree of any lenses the property known as depth of focus, and when this peculiarity—it can scarcely be called a "fault"—is accompanied as in the older forms by considerable curvature of field, it becomes incumbent on the operator to avail himself of every possible means of overcoming the optical difficulties presented.

Still, with such a lens as that just mentioned, an old-fashioned Petzval portrait lens, we must go even further than the swing back, and study another point very rarely considered by the amateur portraitist, namely, the position of the lens with regard to the image in the camera. Nine out of ten, if asked the proper position for the lens on the camera front, would naturally say "the centre," and under certain circumstances this would be correct, as, for instance, in copying a picture or photographing a plane object. So also, in taking a group, if the figures be placed symmetrically and presenting a slightly curved line to the camera, the central position would be the best.

But, with a bust or half-length portrait, the conditions are altogether altered, for the general outline of the object as presented to the camera is that of a curve, in which the face of the sitter occupies the most distant point. If this be taken with the plate in the perpendicular position, *i.e.*, without having recourse to the swing back, and the lens in the centre of the camera front, it will be found practically impossible to secure a satisfactory result, and even when the swing is used matters are but slightly improved. If the centre of the plate be focussed sharply, representing the breast or shirt front of the sitter, owing to the curvature of the field, neither the face nor the lower portion of the bust will be in focus. If the face be focussed sharply, the centre of the picture will be altogether out, and the lower portion only moderately sharp.

And if the lens, by means of the sliding front, be dropped below the centre half an inch or an inch, and the lens brought level with the face, so that the latter forms the centre of the picture, then, by focussing that sharply, the natural curvature of the field, aided by the swing back, will enable almost perfectly uniform definition to be obtained over the whole picture.

This introduces a new question in the proper position of the lens with regard to the picture.

The New Council of the Royal Photographic Society.—At the meeting of the Society, on Tuesday night, it was stated that about 160 members had already applied for Fellowship. Probably this was the most numerously attended annual meeting the Society has witnessed, the keenest interest being manifested in the election of Council. The result showed that the Old Council was almost wholly re-elected, the ornamental but obscure new blood which it was sought, under distinguished auspices, to draft on to the Executive, being left in the cold shade of neglect. We congratulate the members on their common sense and its consequent triumph, and venture to give expression to our own feelings, in the simple but eloquent exclamation, Hooray!

Prizes for Photogravure.—The Society of Arts is offering two prizes—a gold medal or 20*l.*, and a silver medal and 10*l.*—for the best photogravure copy produced from Mulready's picture, *Choosing the Wedding Gown*, now in the South Kensington Museum, the object of the offer being to encourage the development of photogravure in this country. Permission to photograph the picture has been obtained by the Society from the Science and Art Department. For further information as to the conditions under which the picture may be photographed, and for further details of the offer, application should be made to the Secretary of the Society, Sir Henry Trueman Wood, Society of Arts, Adelphi.

Hanfstaengl *v.* **Tyler.**—In reference to Mr. Walter Tyler's letter on this case, which we published on January 25, we have received a communication from the plaintiff's solicitor, referring to two statements of a legal character in Mr. Tyler's letter. Those statements are thus refuted: (1) "It is not the case that 'an Englishman's production must be copyrighted and registered in Germany as well as his own country; on the contrary, there is no registration at all in Germany for works of art, and it has been established by Mr. Hanfstaengl in other cases that, the basis of the Berne Convention being *reciprocity* between the different countries of the Union, it is sufficient to comply with the requirements of the *country of origin* of a work, so that in the case of an English work registration *here* would secure full copyright throughout all the countries of the International Union." (2) "It is not the fact that the Empire Living Pictures case has been lost; on the contrary, it has only been before the Court on an application for interim injunction, on a particular point, and the trial is yet to take place some two or three weeks hence, when all the issues which are so important to copyright-owners are to be fully discussed." As regards the other statements in Mr. Tyler's letter, he, in a letter to Mr. Hanfstaengl, regrets having made them, and says, "The allegations contained in my said statements, (1) That I made any inquiry at all at Stationers' Hall to ascertain if your said works were registered, and was led to copy them through their not having been entered on the register or marked copyright; (2) that I offered twelve guineas with all slides, negatives, and scraps in my possession before action, but this submission was refused; (3) that I was put to unnecessary costs by the proceedings being comtinued after I had done all in my power to make amends, are each and all of them absolutely groundless, and without justification." No doubt, Mr. Tyler's letter was the outcome of a little temporary irritation at the loss of the case, throughout the whole of which he appears to have been badly advised. Indeed, the plaintiff's position in the matter of his copyrights was such that Mr. Tyler may be commiserated with in having been prevailed upon to allow the matter to go into Court. Finally, it is due to the plaintiff to say that Mr. Tyler admits that, both before and during the continuance of the action, Mr. Hanfstaengl gave him every opportunity of satisfying his claims by a proper acknowledgment, and that the matter might have been settled at a very early stage before any legal costs had been incurred, by the payment of less than half the amount which a special jury finally awarded as damages on the trial.

A SIMPLE AND PRACTICAL PHOTO-ETCHING PROCESS.

In the method about to be described there is nothing absolutely new in principle, as it is merely the adaptation of the Merget and Obernetter processes, recently mentioned in a simpler and more workable form for every-day use; and, while my remarks will be to a great extent suggestive, the plan will be found sufficiently practical to enable one interested in photo-etching to bend it to his own special requirements.

So far as I can at present see, both these methods are more specially useful for delicate rather than for bold or deep etching, and would seem particularly applicable to all purposes where a fine grain is supplied by the use of a screen or other means, as, for the rendering of natural half-tone, there does not seem to be the capability of securing the necessary contrast between high lights and

shadows, while, for deep intaglio, the etching process would appear to be too slow and tedious to afford much advantage.

In the Merget process an image composed of silver, gold, or platinum, is deposited upon a zinc or copper plate, presumably in the form of a transferred collodion film; in Obernetter's, a developed collodion positive film, in which the silver has been converted into chloride, is floated off the glass, and caught upon the metal plate in the reverse position, or with the developed side in contact with the plate. In each case the etching is performed by the galvano-chemical action set up between the two metals in the presence of an extremely weak solution of sulphuric or hydrochloric acid, and is said to proceed indefinitely, though the process must necessarily be rather slow if any considerable depth is wanted.

Of the two I am inclined to think that the Obernetter plan is the more energetic, or, at least, if the other is worked by means of a floated-off collodion positive, as the chemical reaction between the haloid and the zinc or copper is more powerful than that of the silver in the metallic state. In the latter the action must depend entirely upon the galvanic current that passes between the two metals, which brings the baser one within the power of the feeble acid; while, in the other, it is analogous to the well-known process for the reduction of the silver haloids by means of copper, zinc, or iron, in the presence of a feebly acidulated solution. At any rate the action commences much more rapidly with the chlorised image, owing, no doubt, to the reduction of the silver chloride in immediate contact with the copper, and also appears to continue more vigorously, although the contact surfaces must, after the start, be similar to those in Merget's method.

Attempts previously made with collodion emulsion have not proved, to any practical extent, successful, and gelatine emulsion has altogether failed, which is not, perhaps, greatly to be wondered at, when we consider that in both cases the particles of silver, whether in the form of metal or of haloid, are embedded in, and surrounded by, the vehicle, collodion or gelatine, which more or less prevents intimate contact between the two metals; and that a slightly better result is obtained with collodion is attributable to its being more porous than gelatine, and therefore exercising less insulating power. In the original Obernetter process, on the other hand, the transferred film was produced, I believe, by the wet-collodion method, in which case the image is, of course, formed of silver deposited on the surface of the film, and therefore perfectly free to act unfettered by the backing of collodion.

The first experiment I shall describe, although I attach little importance to it in a practical way, will enable any one with materials ready to hand to put the process to a rough test, and establish for his own satisfaction the existence of the etching power, after which it is but a matter of detail to work the principle in the best manner possible. Take a piece of ordinary gelatino-chloride paper—I have used the commercial "glossy" samples—and convert its silver into iodide by immersion for a few minutes in a twenty-grain solution of iodide of potassium, and, after washing for a minute or two, remove superfluous water by means of blotting-paper, and then float it for two or three minutes on a thirty-grain solution of nitrate of silver, or apply the latter with a tuft of cotton-wool. Finally wash for five or ten minutes in two or three changes of water, and dry. Without the final floating, the iodide of silver is practically, or should be, perfectly insensitive to light.

Now expose the paper to daylight for a few seconds under a line negative, and develop by means of acid pyro and silver, and, after fixing, the result will be a silver image entirely on the surface of the film; or, if a line negative be not available, a rough-and-ready method of forming an etching image is to write or draw on the surface of the insensitive iodide film with a fine quill pen, and, after drying and exposure to light, immerse it, without previous wetting, in a solution of pyro, or other reducing agent, either plain or acidified, when the writing or design will come up in bold black lines. Wash and fix, and the design is ready for etching. Note that it is highly important not only to fix thoroughly, but also to wash away all the by-products of the fixing, as any soluble or haloid salts of silver left behind will act in precisely the same manner as the reduced metal.

When thoroughly washed, squeegee the design on to a plate of polished zinc or copper. For the purpose of experiment, a piece of ordinary sheet zinc, polished first with flour emery and then with rotten stone, and finally washed in strong solution of soda, will answer quite well. When ready to make the "transfer," take a dish of water of convenient size, and add a little sulphuric acid, in proportion of three or four drops to the ounce, immerse the zinc and design, bring their surfaces together under water, and squeegee in the ordinary manner. Next lay on the top five or six thicknesses of stout blotting-paper, thoroughly saturated with the acidulated water, and cover the whole with a plate of glass, and leave it to act. This method of treatment dispenses with the extreme care necessary in removing the paper without disturbing the image, and, though the action may be slower, it will suffice to show the working of the process. If the soaking of acid water be renewed at intervals during three or four hours, there should be an etching of appreciable depth.

For practical purposes, however, a collodion emulsion, such as described in my article recently, should be used. It requires to be made with a tougher or "hornier" collodion than is generally considered suitable for emulsion purposes; but, in the manner it is used, the quality of the collodion is of less importance from the ordinary emulsion point of view. What is now wanted is a tough film that will safely bear transfer. The emulsion is spread upon paper previously coated with *soluble* gelatine—a spoilt, untoned gelatino-chloride print meets the requirements admirably—treated with iodide of potassium, floated on the silver bath, and finally washed and dried, as already fully described, and is then ready for exposure.

The development is performed with acid pyro, and silver, or may be started with plain pyro, in fact, is precisely similar to the treatment of the old bath collodion dry plates of past years; but, for the fixing, it is almost imperative to use cyanide of potassium in place of hypo, as, apart from the length of time required by the latter to dissolve out the iodide of silver, there is never any certainty that the whole of the hyposulphites have been removed from the compound film. The positive is then transferred to the metal plate as already described.

In the next portion of the treatment come the real difficulties of the process, but these are by no means insurmountable. The easiest plan is to leave the paper in contact with the plate, but this slows the etching action. Before attempting to remove it, however, it should be allowed to remain under pressure for some minutes until the action has commenced and the collodion has got some hold of the metal. Then the plate is placed in moderately hot water to soften the gelatine, when the paper will soon float loose, and, with a little care, may be removed without disturbing the collodion film and image. Then, on immersion in acidulated water, the etching proceeds with apparent vigour. Unfortunately, however, the vigour of action too often proves detrimental to success, and here is another of the troubles. The etching process is accompanied by evolution of hydrogen gas, and this, if the action be too energetic, causes the film to detach from the metal, and causes endless trouble in getting it back into position without damage. To obviate this trouble, it has struck me to heat the plate over a spirit lamp in order to destroy the collodion film, but leave the image in position, but I have so far not actually tried it.

In skilled hands it will perhaps prove easier to float off the collodion film from the paper before placing it on the metal plate, as is the practice in making ceramic transfers. This plan certainly does away with the danger that surrounds the stripping of the paper in the other way, and, if the collodion is suitable, it is quite easy—when the trick is learnt. It is, in fact, this part of the process, the manipulative details, that constitutes the sole difficulty in the way of successful practical working.

I should have mentioned, before transferring the film, that it is optional whether the image be chlorised or not; as I have already stated, I fancy the former is preferable. I may also add, in conclusion, that, on zinc at any rate, I find a platinum image acts more energetically than metallic silver, so that it may prove worth while to adopt platinum toning.

The details here given are necessarily incomplete, but they will, I trust, suffice to induce some others to experiment in the same direction.

W. B. Bolton.

CONTINENTAL NOTES AND NEWS.

Exhibition of Art Photographs in Paris.—It will be remembered that last year an Exhibition of photographs, conducted on lines similar to that of the Salon, was held in Paris. A second Exhibition of the same scope will take place this year from March 21 to April 9 in the Galleries of Messrs. Durand-Ruel, Rue Le Peletier. This is, we believe, an Art Gallery of some celebrity in Paris. Photographs intended for exhibition should be sent to the Secretaries, 40, Rue des Mathurins, Paris, not later than March 1. The Selecting Committee includes the names of J. L. Jerome (the painter), E. Audra, and many eminent artists. We hope to give an account of the Exhibition from the pen of Mr. Alfred Maskell, who is at present abroad.

An Optical Dinner.—On the occasion of the completion of the ten-thousandth anastigmatic lens at their works, the firm of Carl Zeiss, Jena, entertained their staff, to the number of 500, to dinner. Professor Abbe took the chair. The number of lenses mentioned were made in three years.

Screen Kinetoscopy.—According to the *Deutsche Photographische Zeitung*, M. Anschutz has recently shown, in Berlin, a series of projected photographs, chrono-photographically taken, of animals in motion, natural size. The images are said to have been passed across the screen at the rate of twenty-four a second, the spectator being thus, it is said, able to appreciate the effect of actuality and relief. No particulars of the system employed are given.

Spotting Negatives.—The *Photo-Gazette* recommends, as the best colour for stopping out minute holes in negatives, a mixture of carmine, ultramarine, and sepia in gum water, the proportions of the colours being varied so as to approach the density of the negative viewed by transmission.

Toning Albumen Prints after Fixing.—*L'Amateur Photographe* recommends the following formula, which is said to give black tones:—

Ammonium sulphocyanide	300 parts.
Gold chloride	3 „
Caustic potash	3 „
Water	1000 „

DECADENTS AND THE SALON.

The researches of such men as Max Nordan, Lombroso, and others, have been more fruitful than was at first anticipated, and the psychological student can now lay his finger upon such-and-such a man, and prove him to be a neuropath, or upon such-and-such a work (of art?), and say, with certainty, this is the work of a mentally deficient man—of a neuropath. The student of such mental phenomena finds these decadents (*Les ratés* of Daudet) in all branches of art, in painting at the *New English Art Club* and in the *Yellow Book*, in photography at the *Salon*.

The classic symptoms shown by these *crétines* are, according to our authors:—

1. An excessive love of detail.
2. An excessive love of what photographers call "fuzziness."
3. The frightfully sneakish sin of plagiarism.
4. A morbid personal vanity, showing itself in various affectations, as of velvet coats, large hats, and generally posing.
5. *Excessive originality.*
6. A meddlesome practice of sneering and belittling every genius; and it may be noted that these decadents *always band together*, and their common enemy is the man of genius—who always stands alone—as Whistler did with regard to the New English Art Club. The man of genius is never found in a clique.
7. Absolute dishonesty in praising their own work, and belittling that of the man of genius, and absolute dishonesty and lack of sincerity with regard to their own work.

There are other signs and tokens whereby they are known—diagnostic signs set forth by the writers on the disease; but these are sufficient and perhaps no more classic example of "decadents" was ever shown than by the formation of the *Linked Ring*. Not that all its members are decadents—far from it, some joined because they thought it would pay them, others joined because they thought the *art* (*sic*) of photography would be advanced by such an association—for they forgot for a moment "that all attempts of making Art unusual must end in farce and quaint comedy," for the advancement of Art is *with the man*—the individual, as Mr. Whistler has said, and as the subsequent researches of the psychologists quoted prove. Mr. Hardy long ago, in one of his novels, gave us a photographic *nerveuse* in *The Hand of Ethelberta*, if I remember aright, but the Linked Ring was not then existing. Imagine any body of *sane men* calling their chosen picture-hanger "*chief high executioner*," and a photo-etcher who uses a solution of iron "*aquafortis*," and so on, and so on). I have, out of interest, obtained the names of most of that *circle de ratés*, and, as I thought, I find no geniuses in the Ring, though there are some good men led into it, from what motives I know not; for I am not intimate enough with the under currents of the photographic world. But the *originators* of that circle I have discerned and they are one and all typical examples of the class They all cry out loudly about art, all as vain as peacocks. The portraits of most of them have appeared in photographic publications; some used to wear velvet coats; most have plagiarised other writers; all five (for there are five typical cases) have even tried to *appear excessively original*, and pose as leaders and discoverers where they have only been imitators and belittlers of the works that they have imitated. Their very physiognomy marks them out according to diagnostic signs given by the psychologist quoted, and their deeds in the press have been typical and as dirty and unmanly as such characters are capable of. As a mere student of *Decadence in Art*, I was fortunate enough to get on the track of this miserable little band of creatures—they cannot be called men—and I have derived much pleasure and profit in studying them; but the unsuspecting photographer should be warned, and, if he wishes to know them by their works, let him seek at the Salon for their "works." And the funniest part is that some of them have so far imposed upon the public that they have got themselves to be taken seriously. But later on I hope to publish a little volume "*On Decadence in Photography*"—*with portraits*. A little *brochure* that may be of use to future students of psychology—and photography. Apc.

SILVER IN ALBUMENISED PRINTS.

Interesting as Messrs. Haddon and Grundy's experiments always are, in dealing with photographic matters, certain conditions formerly existing must not be overlooked, allowance being made for the very different kinds of paper used now and formerly. In Professor Hardwich's experiments the amount of albumen was exceedingly small as compared with that used at the present time, and in all probability the sizing of the paper was different, although in this matter we have no data to go upon. Paper was certainly more heavily salted formerly, but, on account of there being a much slighter coating of salted albumen, the amount of silver chloride formed would probably be much less then than now. Owing to the less resistant coating of albumen, the silver nitrate solution penetrated more deeply into the paper, so much so that a *good* print could be obtained from the unalbumenised side. Possibly the image formed in the paper was by the action of the silver or organic matter, and not the reduction of chloride, as on the albumenised surface.

Another matter worth consideration is that a paper that, with a silver bath of twenty grains to the ounce of water, would be practically unprintable as far as any *good results* were concerned, the image being weak and mottled, the printing very slow, and when toned would result in a pale, dirty, grey, by the addition of twice the quantity of some other nitrate to that of the silver—say, nitrate of soda—*most excellent work* could be made, and the printing even increased in rapidity, the absorption of gold in toning being also very much less, the permanency of such prints, as far as I have the opportunity of judging, being quite equal to those made with a stronger bath, and I have had some by me for fifteen years, or

thereabouts. A weak silver bath of this kind acted equally well, however the albumen was salted. So far as the commercial qualities of paper—notably they were much alike in this respect—obtainable were tried, any variation seemed to be confined to the rapidity of the printing and the smoothness of toning, the resulting prints being very nearly identical in colour and brightness. In those early days not much study was given by the majority of photographers to the scientific accuracy of the work—effects, and the means used to obtain them, were noted, but anything thought especially good was retained as a secret, and was generally of the most unscientific character. The question of the part played by silver nitrate in the formation of the image is well worth investigating, and I for one shall look forward with interest to any experiments and inquiries that may be made in the matter. EDWARD DUNMORE.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

III.

OBTAINING a suitable standpoint from which to photograph street scenes is at times by no means an easy matter of accomplishment, and it will be found, as a rule, that, when such takes the form of a window which dominates a well-known view, this window, being so well suited for the purpose, will be certain to have had a run upon it by numerous applicants in the past, and very likely to such an extent will this have been carried that the good people of the house have become pretty much annoyed at these continued demands from so many strangers until, finally, they have made up their minds to refuse every one. Then the utmost tact is needed to overcome their scruples. Professionals, however, as a rule are shown more consideration than those casual workers so aptly termed the ubiquitous, and a polite application, first of all by letter from a business source, backed up by a personal call, will seldom fail to eventually gain permission. I have repeatedly overcome many objections in this respect; the making of a business transaction of it goes a long way in breaking down the barrier.

There are numerous cases where no suitable window will be found, and very many streets have never been photographed, from no other reason than the difficulty of securing a suitable standpoint to work from. The hiring of a covered van has frequently been resorted to, but in crowded situations it is not by any means an easy thing to work from such. Over and over again I have known instances where such had to be abandoned on account of the close proximity of other vehicles to the spot the van was drawn up at, and which completely blinded the point of sight.

I have known a casual opportunity offer for such in the case of the alteration of some building in the immediate vicinity of the view required. When such chances are met with, it will be found that the contractors making the alterations invariably erect hoardings or sheds in front of the buildings, and these extend, as a rule, about as wide as the pavement in the street. When such is found, then comes the photographer's chance of securing many views from standpoints otherwise quite unobtainable. These hoardings are particularly comfortable places to work from, and all workmen that I ever met with were only too willing to lend a helping hand in the way of rigging up a trestle in the most suitable place, or even temporarily removing a board from the side of a shed to allow the camera being worked through its aperture.

I now find myself attracted by the sight of every alteration to buildings that I see going on, simply on account of the great facilities such offer for a good standpoint to take many hitherto unphotographed subjects.

It is not, however, from windows or lower elevated situations that a photographer must look for his best standpoints. Very many views require some agility and no little amount of nerve to climb to the roofs of houses to secure the best standpoints. Amateurs, however, find this sort of thing rather too risky and troublesome, and prefer to leave such alone rather than run any risk to life or limb; but the professional has to satisfy the public's taste, and strive to produce what has not hitherto been accomplished by any other opposition firm.

The best views, for instance, of Glasgow, Kelvingrove Park, so much sought after by tourists, can only be obtained from the roofs of the adjoining houses, and the same applies to Glasgow University, and many other open spaces in the west end of the city and elsewhere, near the harbour with its shipping and numerous bridges.

I felt rather nervous when I made my *début* as slater or chimney sweep, but now I find myself rather fond of the excitement of climbing to the roofs of houses, very often by means of a long ladder, and not unfrequently by means of a trap door in the roof.

Some of my best views have been taken from roofs of houses, and this I believe is brought about by the absolute quietude one experiences in being able to work without any obtrusion from onlookers.

At other times, in strong contrast to working from such retired standpoints, an operator has no choice but to make the best of working from the street level. This, to my mind, is the most unpleasant of all situations to expose from, especially when a crowd of the *élite* of some low neighbourhood, numbering from thirty to fifty, are gathered round the camera and gaping into the lens. At first I did not like this sort of thing at all, but after a time it is wonderful how any one can get accustomed to it. A photographer should never attempt working in crowded streets without having an assistant to help, or he will very likely find himself minus some of his apparatus, or at least of its being damaged.

In any case, once a suitable standpoint having been fixed upon and secured, it may safely be considered that the greatest obstacle has been overcome, for, with the exercise of patience until the best light is available for the purpose of exposing, all the rest will follow in due order.

When working from windows, I have almost invariably found the ordinary, or I may truthfully say the extraordinary, tripod of the daddy-long-legs form folding pattern quite useless for the purpose of setting up the camera, and now I never dream of taking a tripod with me when photographing from a window, for practice has taught me that in no instance is such of any practical use, for I have always been able to obtain some common article on the spot which in itself was far more suitable than any tripod could possibly be. From time to time we hear a good deal about the necessity of tripods having sliding legs, so as to permit of their being used in all sorts of situations, but I never yet found that a sliding-leg tripod was any better—if, indeed, half as good—as one whose legs were all in one piece. When working from a position where one won't suit, the other will be found quite as useless, and hard practice has shown me that it is far better to set about rigging up some other means of holding the camera than by wasting time bothering with any tripod.

Most offices or houses can boast of an ordinary chair or office stool, and there is always a large book or flat board to be found lying about somewhere that will do duty as a support.

I know one case that I met in with in my experience which shows to what an extent some people are run upon for the use of their window. It was when photographing one of our largest city hotels. The best point to do this from was the window of a neighbouring office, and so frequently was this called into requisition for the purpose that the kind gentleman had actually gone to the trouble and expense of rigging up a wooden support that fitted the window sill. This he most obligingly placed at the services of those he permitted to use the window; but, then, Mr. Wood—for such was the gentleman's name—knew something about photography and its requirements in such cases, he being an amateur photographer of some considerable experience.

The fact is, an ordinary tripod is of no use when working from a window, and it is only adding to one's impedimenta to bother taking such with one when setting out for such work.

The photographing of street scenes requires the services of the very best apparatus. The shutter must be such that will not allow light to pass whilst the door of the dark slide is withdrawn, and the sensitive plate exposed to the interior of the camera. Whilst waiting for the exact moment for exposure, this is a caution which many may not consider of much importance; but, since so many shutters have been constructed with flexible material, of the blind pattern, after some use these are very liable to pass light, and this often goes unnoticed, causing fog, for it frequently happens that, to secure a well-balanced crowd or the vehicles in nicely situated positions, some considerable delay is often required between the time of drawing the door of the slide and making the exposure. A sensitive plate is sure to suffer if there is any leakage from the blind of the shutter.

One simple precaution, which I have adopted when using an ordinary Kershaw, is to place two little pins just over the aperture, and on which I hang a spare cap of a lens sufficiently large to cover the entire opening of the shutter. This is quickly removed just when springing the shutter for exposure.

In strong sunlight it is wonderful how searching the rays of light are, and how they reach a sensitive plate, even in spite of the utmost precautions, is marvellous. T. N. ARMSTRONG.

PHOTO-PROCESS WORK.

[Edinburgh Photographic Society.]

IT is with some hesitation that I venture to read a short paper on photo-process engraving, a process which is occupying the minds of all who are

interested in the art of illustration. I shall confine my remarks mainly to the photo-engraved blocks for typographic printing, which, amongst the various processes, has by far the largest field open to it. To produce first-class half-tone photo-engraved blocks it is necessary to have suitable appliances for the making of the negatives, the foundation work of the process. This part of the work appears most simple, especially with the aid of the dry plates recommended for photo-mechanical work. It is, however, only after much trial and vexation that one is forced to revert to the old wet-plate method, which is found to give the most satisfactory and reliable half-tone negatives. Having mastered this, it is necessary to have a fine line screen plate for the breaking up of the continuous gradations of light and shade in the picture to be reproduced. Owing to the high price of perfect screens, one is tempted to try those advertised at a cheap rate, or fall back on muslin, gauze, &c., as used by Mr. Fox Talbot some forty years ago; but, after all, it seems hopeless to accomplish the art reproductions of the present day without the use of the perfected line screens, as made by Max Levy, M. Wolfe, and others. The one most used is that with 132 lines to the inch, a specimen of which is now shown on the lantern screen. Screens with eighty lines are used for newspaper illustrations, or for large and bold subjects; 120 is very suitable for the ordinary run of magazines, or general illustration, when printed along with letterpress; that with 150 lines to the inch is good for subjects with fine detail, or art reproductions where the greatest care will be bestowed, and the best materials used. Screens are made to a still much finer degree, but I do not think that they can be used with any success commercially at present for typographic work. The near future will, no doubt, bring in marvels of the finest printing, and it is sincerely hoped that our own romantic and world-famed city will continue to lead in the highest class work, as it has done in the past. Many process engravers keep the same high standard before them, so as to secure and maintain the highest degree of excellence.

It is not within the scope of this short paper to discuss the many points of the screen, important as these are. The screen is placed in the dark slide in front of the wet plate, and requires the most careful manipulation. In determining the distance between the screen and wet plate, no set measurement can be given, as a long-focus lens with small aperture would yield a different result from one of shorter focus and wide aperture. Experience is the best teacher in regard to this most important point, the different styles of pictures requiring various methods of treatment to produce the continuous gradations necessary to yield the half-tones. Some workers prefer adjusting the screen to the various pictures, others prefer having it nearly at a fixed distance, and use diaphragms to get the desired effect. When this experience is gained, a triumph is secured. The negative having to be reversed, it is needful to have a mirror or prism attached to the front of the camera. This is the most expeditious mode of getting a reversed negative, but seems to lose light and sharpness of detail. It is therefore better to expose direct, without the aid of mirror or prism, and afterwards strip and reverse the film. Having secured a first-class negative, the next operation is to get it printed on to the metal, which is usually zinc specially prepared. This is cut to the required size, leaving about half-an-inch margin all round, after which it is made chemically clean, and coated in a dark room with the following solution:—

Albumen	1 ounce.
Distilled water	8 ounces.
Bichromate of ammonia	25 grains.

Switch or beat the albumen to a froth, and allow it to settle; dissolve the bichromate in the water, then add the albumen, and mix well together by means of an egg switch, or by placing some broken pieces of glass in the bottle, and shake well; add ammonia drop by drop until it turns litmus paper blue, filtering it through a piece of absorbent cotton-wool; it cannot be filtered too well. To secure an even coating, considerable practice is required if it be done by hand, but it can be easier accomplished by means of a whirler, an appliance now almost universally used by process workers. There are many forms, some of which I have tried, none of which came up to my mind. The one I now use is more elaborate than most, but it has the great advantage of coating and drying in one operation. The first flowing is allowed to run to waste, and the second and third may be returned to the stock bottle through the filter funnel. When the coating is seen to be free from air bells or specks, it is gently dried over a spirit lamp or Bunsen burner, care being taken not to heat more than the hand can bear, or it may be rendered insoluble.

The negative is then placed in a specially strong frame, with glass front about five-eighths of an inch thick, fitted with cross bars and wood screws. The coated plate is placed carefully on the top of the negative, a felt pad or several piles of blotting-paper laid on, and the back well and evenly screwed down to bring all parts into proper contact. It is now exposed for a period of from three to five minutes in a summer sun, or in the shade from ten to twenty minutes (in the winter months the exposure is, of course, much longer), then taken to the dark room and laid on a board, and rolled over with a thin layer of photo transfer ink, placed in a tray of water to develop, being gently rubbed meanwhile with a tuft of cotton-wool. When the picture is fully developed, and compares favourably with the original, it is strengthened by rolling up as a lithographer does on stone, which is, in truth, no easy matter, having the production of such fine work in view. After carefully overlooking the whole to see if no dots are wanting, and the back with the marginal parts varnished, it may now be said to be ready for the first etch, which it receives in a weak bath—

Water	120 ounces.
Nitric acid	1 ounce.

The bath is gently rocked to and fro, the oxide being brushed off as it gathers, to allow clean and equal etching. When deep enough to catch the finger nail, it is taken out and well washed under the tap, then dried. A proof is thereafter taken, and usually handed over to the artist etcher to complete in as many etchings as may be found necessary. Many subjects can be satisfactorily reproduced without the aid of an artist or fine etcher. All the blocks and proofs submitted to-night have been done without such aid.

Bitumen printing is preferable to the foregoing method, as it saves the preliminary inking and the risk of blurring or thickening the lines or dots, but its slow printing qualities are sorely against its general use. Glancing at this process, I may say that the metal is cleaned and coated with sensitised bitumen, as described for albumen printing, but allowed to dry spontaneously, which it does with rapidity. When the necessary exposure has been given, it is developed in a tray containing turpentine, then washed and dried, the back and edges coated with resist varnish, after which it is ready for the first etching. To give you some idea as to the difference in the time for printing, I submit for your inspection a specimen which took forty-five minutes to print in the summer sun, whereas three minutes in the same light would have been sufficient for albumen.

The dusting process is quick and simple, but I have not found it quite so certain in its results.

The process that has "caught on" with fever heat is the one known as the enamel process. There are many formulæ for making the enamel, but the majority are made up of fish glue, albumen, water, bichromate of ammonia, and a few drops of ammonia. Many omit the albumen, but my experience has led me to adhere to it.

The enamel is flowed over the plate and dried with gentle heat, printed and developed in much the same manner as in the albumen process, but no ink is used. When fully developed, it is dried gently and gradually heated until the enamel assumes a deep chocolate brown. Coat the back and edges as before, and it is ready for etching. I believe that this process is much better suited for copper than zinc.

I would like to mention that the half-tone process is quite adaptable for litho work, and can be printed direct from the zinc plates, as specimens, which I have pleasure in submitting, or transfers can be pulled and retransferred to stone, and the zinc plates held as originals, from which fresh transfers could be pulled at any time.

I am most anxious that letterpress and litho should work more together, believing that, with the combination, splendid results would be realised.

Much has been said regarding the photographic profession allowing process work to slip past them. I fear many of the wails come from the would-be teachers of process work, and who seek to induce the profession to take it up, they, of course, teaching the whole process for the small sum of a few guineas. It is so simple that only a few lessons make pupils proficient. My own belief is that the professional photographer is gifted with a big share of common sense and foresight, and is quite capable of judging for himself. However, any of the methods has a fascination that is hard to overcome, and, it may be added that, if one has surplus money, the art of process engraving is quite equal to the task of using it up.

In conclusion, it may be well to mention that, in order to work out the process as a commercial success, the electric light is an indispensable factor in the production of blocks, giving not only uniformity of quality, but that necessary promptitude of execution which, in these days of break-neck speed, are everywhere desiderated. JOHN HISLOP.

COLOUR PHOTOGRAPHY.

[Society of Amateur Photographers of New York.]

THE old dictionaries define light as the agent which produces vision, an colour, as a property inherent in light.

Such definitions do not greatly enlighten us. Light is not only the agent which produces vision, but it is a form of energy as important as heat and electricity. Perhaps few people realise that it is a force without which life, even, as we know it, could not exist. Vegetable life, the primary source of animal food and therefore of animal life, is dependent upon the power of light to produce chemical change, and our very existence is, therefore, by virtue of that same power which impresses the camera image upon the sensative plate.

A ray of ordinary light is a complex wave motion travelling through the hypothetical ether, as sound travels through air, but with a different form of wave and nearly a million times faster, so fast that many hundreds of millions of millions of successive rays enter the eye in a single second, yet slow enough to take a lifetime to reach us from some of the stars in the sky.

Each ray of ordinary white light can be divided into thousands of rays

of coloured light by the prism, and each of those divided rays can be split up and twisted in the most extraordinary manner in the polariscope.

Knowledge of the wave structure of light should be of the greatest service to the experimental photographer, because the kind and rate of vibration that produces chemical change in some substances does not affect others, and in some cases the effect of one constituent of a light ray will be neutralised by the opposite effect of another constituent of the same ray. Only by separating an ordinary ray of light into its constituent vibrations, and exposing our sensitive plate to each separate kind, can we arrive at a clear understanding of the possibilities at our command.

In practice we cannot handle a single ray of light, which is something infinitely slender; but the constituents of a bundle of rays, or a "pencil" of light, can be reflected, refracted, dispersed, split and twisted like a single ray.

We will first disperse white light with a prism, showing that it is a mixture of rays of many colours, from red through orange, yellow, green, and blue to violet. We first project on the screen a line of white light, and when we insert the prism it separates the different wave-lengths as we would open a fan, changing the narrow line of white into a broad ribbon of colour.

It is, therefore, proved that white light is a mixture of coloured rays. We know that in white light most objects show colour. A simple experiment will show the cause of most ordinary colours. If we place a red glass in the path of the rays, we see that it is red because it absorbs or destroys nearly all the rays except the red. A green glass is green because it absorbs nearly all but the green rays. Most of the colours in nature are not so simple, but they are generally due to absorption, like the red and green of the glasses. An ordinary blue glass is blue, not because it absorbs all but the blue rays, but because it transmits more of the blue and violet rays than of other colours; the absorption is a peculiar and interesting one. Yellow glass is yellow, not because it absorbs all but the yellow rays, but because it absorbs the blue and violet. We may even have specific absorption without producing any perceptible colour, as with some specimens of didymium glass, which looks like ordinary white glass, only not quite so clear. I have a block of such which almost completely absorbs the yellow rays of the spectrum. Make a mental note of this, because I shall demonstrate another interesting fact by the aid of this didymium glass.

Although most of the colours in nature are the result of the absorption of some of the constituents of white light, many objects which transmit all of the spectrum rays as freely as ordinary window-glass show colours, the most brilliant and beautiful colours conceivable, when spread out in very thin films like the soap-bubble, or in the polariscope, in which split rays are twisted or again divided and made to interfere with each other so as to neutralise or suppress some wave-lengths, and so give rise to the well-known colours of polarised light.

The old and long-standing reproach against monochrome photography, that it rendered light colours, such as orange, in dark monochrome, and dark colours, such as blue, in light monochrome, was due to the fact that the ordinary iodide, bromide, and chloride of silver of the old Daguerreotype and collodion processes are practically insensitive to any but the blue and violet and ultra-violet rays of the most refrangible end of the spectrum, while the eye is far more sensitive to other rays. Although the majority of photographers continue to make such untruthful photographs, it is no longer necessary to do so, since plates are now produced which are highly sensitive to the green, yellow, and red rays. I have a slide made from spectrum negatives of such plates. These particular photographs were made about ten years ago, on collodion bromide plates, ordinary and sensitised with erythrosine, cyanine, and chlorophyll. It is possible to prepare plates which are almost equally sensitive to the orange-red, yellow, green, and blue, and by cutting off some of the blue, violet, and ultra-violet rays by means of a light yellow glass, we can readily obtain substantially correct translation of colour values into monochrome with such plates. It is also possible to do it with some ordinary rapid gelatine-bromide plates by giving very prolonged exposures through suitable colour screens—a fact which is generally discredited in the photographic world, although I demoustrated it conclusively nearly ten years ago. Such photographs are called "orthochromatic," and I will give you a single illustration of their superiority for some subjects.

We have seen that the spectrum colours change as the wave-length of the light varies; but we now come to a fact of the greatest importance in its bearing upon the subject of colour reproduction by photography. Colour does *not* depend upon wave-length only. Some of the brighest colours of the spectrum can be exactly reproduced to the eye by mixtures of other and quite different spectrum rays. For instance, the yellow of the spectrum can be perfectly imitated by a mixture of red and green light, although analysis by the prism shows that there is no yellow light in the mixture. This may be readily shown by placing the yellow glass in the lantern, and in front of it the little block of didymium glass. We have seen that the yellow glass is yellow because it absorbs the blue and violet rays, and we know that the didymium glass absorbs the yellow rays. When we have only the yellow glass, red, orange, yellow, and green rays reach the screen; the didymium glass cuts out the yellow rays, leaving only the red, orange, and green, yet the hue of the yellow on the screen is unaltered.

By further experiments of this character it has been proved that all the colours of the spectrum, and all the colours in nature, can be imitated by definite mixtures of the deep red, the purest green, and the blue-violet spectrum rays. This fact, which supports the modern theory of colour vision, is also the basis of the first successful method of natural colour photography successfully demonstrated in 1888, and named "composite heliochromy."

Composite heliochromy is a system of photography which is capable of automatically and accurately reproducing the colours of any objects that may be photographed, although the direct action of light upon the sensitive plate does not produce colours, but only a record of colours, which record is afterwards translated into colour again to the eye by either of two distinct methods. Three negatives are required to produce the colour record, because, as I have already explained, there are three colours which can be made to reproduce all others by mixing in suitable proportions. It is the function of the negatives to secure a correct mixture of these colours in the composite colour photograph.

The colours produced by such admixtures are not, of course, physically identical with the spectrum colours which they represent to the eye, and the imitation is a perfect one only to people having normal colour vision, and under normal conditions. For instance, the mixture of red and green will perfectly reproduce the yellow of the spectrum to a person who has normal colour vision, but not to one who is partly colour-blind to red; and even to a person of normal colour vision the mixture may be made to appear either red or green by interposing suitable colour screens, which do not alter the hue of the spectrum yellow in the least.

Such mixtures could not, therefore, be said to actually reproduce all the natural colours if colours were objective, as was taught by Newton and Brewster. But colour is merely a sensation, like heat, cold, taste; and therefore to produce the same effect upon the nerves of vision is to produce the same sensation, which is, the same "colour."

The explanation of this is, briefly, that there are three fundamental colour sensations, which, it is convenient to assume are due to three kinds of nerves in the eye (although some other explanation may eventually be found), and most of the spectrum rays excite two fundamental sensations at once, in different degrees. Maxwell believed that the pure red rays, the pure green, and the spectrum blue-violet, those colours which can be made to reproduce the sensation of all others, excited exclusively the respective fundamental colour sensations. By means of a very ingenious optical device which is known as "Maxwell's colour box," he reproduced all of the other spectrum colours to the eye by mixture of these, and plotted curves showing exactly what mixture was necessary to reproduce the colour at any point in the spectrum.

Recent investigations have established the fact that the green of the spectrum does not accurately represent the fundamental green sensation, but that sensation degraded by considerable admixture of red, and a very little violet. But there is no other means of exciting the green sensation so exclusively in a person of normal colour vision as by exposing the retina to these particular spectrum rays, and a successful system of composite heliochromy must therefore be based upon such measurements as were made by Maxwell. Abney has obtained somewhat more accurate results, but the differences are of very little importance in this connexion, because they are due chiefly to the use of purer colours with which to make the mixtures, and Maxwell's "fundamentals" are about as near correct as anything which it is practicable to employ for reproduction purposes in composite heliochromy.

The application of Maxwell's colour curves to composite heliochromy is most readily shown by assuming that we wish to reproduce the spectrum itself. We know that, in order to do so, we must mix the three colours which Maxwell assumed to be the fundamentals, and that for each part of the spectrum we must mix them in the proportion indicated by the height of the colour curves in the diagram. One negative represents the red, and all of the spectrum from A to E must act in producing it, in such proportion that it will show a distribution of density corresponding to the first curve of the diagram. We may secure this by exposing, through a suitable orange-coloured screen, a gelatine-bromide plate sensitised with cyanine; or, the same result can be obtained with commercial "orthochromatic" plates by exposing for a much longer time through a compound screen of brilliant yellow and fuchsine. Another negative, which represents the green, must show a density curve corresponding to the second curve in the diagram; and another, representing the blue-violet, a density curve corresponding to the third curve in the diagram. These three negatives constitute, by their distribution of light and shade, a record of the colours of the spectrum, an complete the first stage of the process of composite heliochromy. The same set of screens is used for photographing all objects, because a procedure that will secure a correct reproduction of each and every separate spectrum colour must reproduce all mixed colours as well.

Our colour record in no way suggests colour, but if we make lantern slides from it, and project one with red light, one with green, and one with blue-violet, in proper register upon the screen, the mixture of the three colours, regulated by the variations of density in the positives, will produce a perfect reproduction of the spectrum we photographed, all except the blue-green, which will be very slightly degraded by admixture with white.

The process as described seems complicated and round-about, but the production of the colour record has been so simplified by the invention of a special camera, that it is exactly as easy as the production of an or-

dinary photographic negative, the three images being made by simultaneous exposures on a single plate. It was necessary to simplify the operation of the process in this way in order to make it available to unskilled operators, or even to make it reliable in the hands of the most skilful. It was also desirable to provide a means of translating the colour record into colour more simple and convenient than by lantern projection, and this is accomplished in the photo-chromoscope, a table instrument not much larger than a stereoscope. In this instrument, each of the monochrome images is seen through its appropriate colour screen, but the three blended into one image on the retina, reproducing the colours so perfectly that one appears to see the object itself instead of a picture.

The photo-chromoscope and photo-chromoscope camera and process together constitute a means of reproducing the natural colours which is almost as simple in operation as stereoscopic photography, and the instrument can, of course, be made stereoscopic, so as to combine stereoscopic relief with colour. It is only necessary to duplicate some of the parts, just as an ordinary camera is made stereoscopic, by using two objectives instead of one; but Nachet, of Paris, claims to have recently accomplished the result in a simpler manner, by viewing the image of the red and green sensations with one eye, and that of the blue violet sensation with the other. Such an instrument, however, can be neither a true photo-chromoscope nor a true stereoscope. It is defective as a stereoscope because the same colours are not seen by both eyes, which tires the nerves of vision, and because some strongly coloured objects will be distinctly represented only to one eye, and therefore without stereoscopic relief. It is even more defective as a photo-chromoscope, because colours cannot be perfectly blended except upon the same retina, the impression being otherwise a changeable one, as the attention is involuntarily drawn from the sensation in one eye to that in the other in rapid succession. This curious effect may be seen by placing a deep ruby-red glass in front of one eye, and a deep green in front of the other, and looking at a white object. If Nachet's idea was correct, the object should appear a bright yellow, but, in fact, the colour is not only changeable and the impression irritating to the eyes, but it is never at any moment a good yellow. With yellow and blue glasses, corresponding to the mixtures in Nachet's instrument, the defect is less marked and irritating, but it is of the same character. In my own instrument, which will be shown at the close of the lantern demonstrations, each eye sees an image complete as to colour rendering, and it is only necessary to place a yellow glass over one eyepiece and a blue glass over the other, practically converting it into a Nachet instrument, in order to make the result intolerable by comparison.

By an extension and further complication of the system, permanent colour prints may be made, either as transparencies on glass, suitable for lantern slides, or prints upon paper; but absolutely satisfactory results can be obtained only in the photo-chromoscope, and, in my opinion, all other applications of the system are of less importance because they are more complicated, more difficult, and less perfect in proportion to their complication.

The production of permanent colour-print lantern slides, however, promises to become, some time in the future, an important industry. Already it has reached such a stage of perfection in my hands that, although it costs far more to produce these pictures than ordinary hand-painted ones, the results are so exquisite that I doubt if anybody would use painted slides who could get these at ten times the cost, and I think their first use as popular lecture illustrations this year will mark the commencement of a new era in lantern lecture work.

These lantern slides are made from the photo-chromoscope negatives by a comparatively simple process, which is not difficult to carry out, except that it requires a master of the science to recognise and keep to the conditions which guarantee a high degree of accuracy in the results. A thin sheet of clear celluloid coated with bichromatised gelatine is exposed to light under the negative, the light passing through the negative to the sensitised gelatine. The resulting print, which shows the three images of a chromogram in a delicate brown colour, is placed in hot water, which dissolves away all of the gelatine that is not rendered insoluble by the action of light, and leaves the image in very low relief in transparent gelatine, the shadows of the picture being represented by various thicknesses of the gelatine, and the extreme high lights by clear celluloid. The three images are then cut apart with scissors, and each coloured up by soaking in a solution of a dye, the colour of which is nearly complementary to the fundamental sensation which that image represents. The dye does not colour the celluloid, which merely acts as a transparent support for the gelatine picture, but is taken up by the gelatine in proportion to its thickness. Relatively, too much or too little colour in any one of the prints will destroy the accuracy of the colouring in the composite whole, and in practice it is almost always necessary more than once to wash out the colour and immerse in the dye again for a longer or a shorter time. The coloured prints are superposed so as to bring the three images into register and make them appear as one, and, if the deepest shadows are then a neutral black, the colours should be right throughout all the shades of the picture, and will be if the correct printing colours are used and the known theoretical conditions of success adhered to. When satisfactory, they are cemented up between glasses with Canada balsam, and fastened by a paper binding on the edge.

In triple lantern projection and in the photo-chromoscope, the image of the red sensation is projected with red light, the green with green light, and blue-violet with blue-violet light. In three-colour printing, the image of the red sensation is a cyan-blue print, the green a pink print, and the blue-violet a yellow print. This is confusing to most people, but it is easy to show that it comes to the same thing. When we have made a white disc on the screen by means of the triple lantern and its red, green, and blue-violet lights, we shall find that, if we insert a positive in the red section, the result upon the screen is a cyan-blue picture on a white ground, looking exactly like the cyan-blue print we have to make from the negative of the red sensation in three-colour printing. The same for the other images, which are pink and yellow. We get no black shadows on the screen until there is a positive in each section. In the same way we get no blacks in three-colour printing until all three prints are superposed.

The function of the uncoloured positive in triple projection and the coloured positive in triple printing is therefore the same, *i.e.*, to suppress by its shadows those rays which excite powerfully the fundamental sensation which that positive represents. In triple printing, the positive of the red sensation is cyan-blue, which absorbs first of all the red and orange rays, but also, progressively, the yellow and green-yellow, freely transmitting only those which excite most exclusively the other two sensations. The positive of the green sensation is a pink, which absorbs first of all the green rays, but also, progressively, the yellow and green-blue. The positive of the blue-violet sensation is a yellow, which absorbs first of all the violet rays, but progressively the blue and blue-green. These colours are called the printing colours, and are the only ones that are capable of reproducing all others by absorption, as red, green, and blue-violet light will by mixing.

Note that the printing colours are not "red, yellow, and blue," but pink, yellow, and green-blue. The fundamentals are obtained by superposing films of these colours two and two. Thus it requires a combination of pink and yellow to produce red, the pink and cyan-blue to produce blue-violet, and the cyan-blue and yellow to produce green. Each printing colour represents the abstraction from white light of one of its fundamental colour elements, and Capt. Abney has therefore suggested that the fundamentals be termed +R, +G, +V, and the printing colours —R, —G, —V. The fundamental violet is the spectrum blue-violet, and not the violet of commerce, which is purple. I have brought with me a few lantern-slide colour prints, which I will now have run through the lantern before entering upon the subject of machine three-colour printing.

By a still further extension of the system, prints are made on paper by machine printing with half-tone process blocks. We have heard a great deal of this method for two years past. What little invention there is in it should be credited to me, as I made such prints, with single line, half-tone process blocks, as long ago as in 1881, and exhibited a specimen of such work at the Novelties Exhibition in 1885. I have one of the original prints with me to-night. The subject is not a showy one, and the reproduction is of small size. I have also brought with me a larger reproduction of a more striking subject, which I made a few days ago. It has not yet been proved that this method is capable of profitable operation in competition with chromo-lithography, although we have better inks, paper, and presses for such work than I could find in 1881, and I have no doubt that the printing-office conditions will be realised in course of time.

At present, the photo-chromoscope and triple-lantern projection system, yielding the most perfect reproductions of colour, are also the only ones simple and reliable enough so that they can be made practically available by amateur photographers. The colour-print lantern-slide process is far more difficult and costly to carry out in a perfect manner, and the results, although beautiful, certainly not quite so perfect. The machine-printing process is still more difficult to carry out in a satisfactory manner, and the best results appear very crude indeed when compared with the photo-chromoscope image.

The editor of a well-known photographic magazine has quite recently asserted that the natural colours have not yet been reproduced as seen upon the ground glass of the camera; but, if that editor is here to-night, he will have an opportunity to see in the photo-chromoscope a more perfect reproduction of coloured objects than he ever saw on the ground glass of the camera, because it is free from granulation, and, being in stereoscopic relief, looks like the very object itself. F. E. Ives.

PHOTO-MECHANICAL PRINTING PROCESSES.

[Society of Amateur Photographers of New York.]

Almost without exception, all photo-mechanical processes—at all events, all the processes on which I shall touch to-night—are based on the action of light on gelatine in presence of a bichromate. This is the very grammar of them, and it is important, at the outset, that this action should be well understood. The explanation of the processes based on this principle will not then be difficult.

Gelatine—ordinary cooking gelatine I mean—when put in cold water, absorbs a certain amount of water, and swells or expands. In hot water it dissolves. If, in the hot water in which it is dissolved, there is also dissolved a sufficient quantity of a bichromate—as of potash or ammonia

—and, after mixture, the water is driven off, the resulting gelatine and bichromate has acquired a new property. It is subject to the action of light. Kept away from light, it still swells in cold, and still dissolves in hot water; but, if light is allowed to act on it, it ceases to have this quality; it no longer expands in cold water, it no longer dissolves in hot water. On this alteration of quality depend all the photo-mechanical processes which are in common use.

I know there are many here to-night to whom this is an old, old story, but it seems to me to be so important a one, that I am not afraid to iterate and reiterate it.

Let us carry this rudimentary idea a step further. If we take a sheet of bichromatised gelatine, it will, of course, be easy to expose part of it only to light, and shield the rest from light, with the result that the part so exposed becomes insoluble, whilst the remainder retains its normal condition of solubility. If a shield can be used which will allow only the action of the light on the gelatine where desired, we shall have a sheet of gelatine, soluble where desired, insoluble where desired. A photographic negative is such a shield, and a sheet of bichromatised gelatine, exposed to light under a photographic negative, becomes a reproduction of the negative, in varying degrees of solubility and insolubility, according to the degrees of opacity in the negative.

It is, of course, to be understood that such a sheet of gelatine carries with it that other property, of varying degrees of absorption and expansion, so that we are also able to obtain a picture, not having varying degrees of light and shade, but one having varying degrees of relief and depression.

There are two groups of processes based on this principle—one in which the ordinary methods of printing, such as lithographic, surface, or intaglio printing, are employed, whilst the printing plates themselves are produced by devices dependent on this action of light, the other group, in which not only the printing plates are dependent on this principle, but the printing methods are new and peculiar. Such as this are the photo-gelatine processes and Woodburytype.

Taking the lithographic method of printing first, we find, under the name of photo-lithography, bichromated gelatine is used as a means of obtaining lithographic transfers from negatives. Lithography depends on the repulsion of grease and water. Broadly, a design is drawn on a porous stone with grease. The stone is sponged over with water, which is absorbed, except where there is grease. A roller charged with greasy ink is then rolled over the stone. The greasy ink attaches itself to, and reinforces, the greasy parts of the stone, but is repelled where the porous stone has absorbed water. Paper pressed on the stone picks up a portion of the greasy ink, and the whole operation is repeated. To obtain a greasy design on stone by photography, paper coated with bichromated gelatine is used. This is exposed to light under a negative. Placed in water, the water is absorbed where light has not acted. Grease applied to the surface attaches itself where light has acted and where the water has not been absorbed. The form in which the grease is used is lithographic transfer ink, which, in fact, is grease with colouring matter added to it. In this way, a photographic design in greasy ink is obtained on the surface of the bichromated gelatine paper. This is transferred by pressure to the lithographic stone. The rest of the operations do not differ from those of ordinary lithography.

Photo-lithography is the oldest of the photo-mechanical processes. It has been, and still is, very extensively used.

We may take, next, the method of preparing photographically plates for surface printing. This is best understood by the statement that these are the plates which are used to print with type. It is the photographic substitute for wood-engraving, and is known as photo-engraving. We all know what a type (a printer's type) is—a letter or design cut or carved on a plane surface, all the plane surface being cut away except that which forms the design or letter, this remaining surface, when printed, being charged with ink from a roller, and the ink transferred from the surface to paper by pressure. This explanation indicates why all such work is called surface printing. The present method of producing photographically a plate capable of surface printing is, first of all, to make the negative. Light is allowed to act through this negative on to the surface of a metal plate—generally zinc or copper—which has been coated with bichromated gelatine. The light renders the gelatine insoluble where it passes through the negative, and the design is thus, by the action of light, formed of insoluble gelatine on the surface of the metal. The rest of the metal is etched away to a sufficient depth, leaving the design in relief, and the surface of it ready to be inked and printed. This, very broadly, is the present method of photo-engraving, which, like photo-lithography, is another of that first group of processes where the ordinary method of printing is employed.

But both of these processes—photo-lithography and photo-engraving—are only capable of rendering black and white; they do not reproduce true photographic gradation. True photographic gradation consists of varying degrees of transparency of colour, or of washes of colour, from complete opacity to complete transparency. It can easily be understood that lithography, which only recognises grease or water, or surface printing, which only utilises a uniform flat surface, cannot render either photographic gradation or varying washes of colour. Some plan, therefore, must be used, by which the simulation, at least, of gradation must be arrived at. This is secured by breaking up the gradation into dots or lines—dots or lines of such fineness that, though existing, shall not be too apparent, yet distinctively dots or lines formed of solid colour, varying only in size or separation. In photo-lithography such a result may be produced by the formation of a chemical grain, such as appears in the work of the Sprague Ink-photo process, or by a network of lines secured in the negative. It does not appear, however, that as yet a satisfactory, reliable breaking-up of a photographic image into the simulation of gradation has been reached. Undoubtedly, such a process would be very valuable.

In photo-engraving, however, a far more satisfactory result has been reached. Without attempting to follow the growth of the present method step by step, it may be briefly described. A negative is made of the desired subject with this modification, in the camera, in front of the sensitive plate, has been placed a ruled screen. This ruled screen consists of a series of alternate opaque and transparent lines, of great fineness—generally 125 to 150 lines to the inch. Across this set of lines is ruled another series of similar lines at right angles. The result is a screen of alternate opaque and transparent squares. It might naturally be supposed that these squares would be reproduced of uniform size all over the negative. This will not be the case. In the shadows of the negative there is no action of light, consequently the squares do not appear at all. In the half-shadows, or half-tones, the squares appear normally, whilst in the lightest tints the amount of light is so considerable that it creeps round the squares and makes them smaller and smaller, according to the amount of light transmitted, till, in the highest lights, they become mere specks, but still specks of definite colour. The appearance of roundness which these squares have is a visual or mental illusion—in the same way that, if a series of round black dots be made on a white ground, with narrow interspaces between them, the dots will appear hexagonal. The negative of the picture having been obtained by this device, it will be found that the picture is broken into dots of varying size, and yet of such minuteness that the fact of its being so constituted is not very apparent. The printing plate is made from the negative by the photo-engraving process described. There is no photo-mechanical process which has grown in use so rapidly, there is no process which is so largely used. It is a process which, with good handling, gives admirable results, but without it is worse than worthless. I am safe in saying that at present a large mass of it is worthless, but a higher education of printers is going on, and the number of those printers who can properly handle half-tone work is increasing yearly. At first, it was stoutly asserted by almost all printers that it was not possible to print half-tone plates satisfactorily—a not unusual assertion that is made with regard to all innovations. To-day, in view of what has already been done, no such argument can be used, and all intelligent printers are coming into line. Very many examples of this process are shown in this exhibition, to my mind the most remarkable being those of the National Chemigraph Company. It is indeed hard, at first, to realise that these results are only half-tones. On examination, however, this fact becomes apparent. It becomes apparent also that they are not "only half-tones." There is discovered to be a second printing from the same block, but in a tint ink, the two impressions being slightly out of register with one another. This greatly enhances the beauty of the result.

We can now turn to the last of the group of photo-mechanical processes in use in which the ordinary methods of printing are employed—I mean photogravure.

In passing, I would like to have my fling at the too-often intentional misnaming of process results. Photogravure is well understood to be the photo-mechanical process which, though it is the most expensive, yet, confessedly, yields the best art results. A photogravure plate is well understood to be an intaglio printing plate produced by photography; a photogravure print is not a gelatine print, it is not a photo-engraving or half-tone, it is not a photo-lithograph, but the publishers call the results of all these cheaper processes photogravures, because the public calls for photogravures, and this is done by some publishers whose names stand very high in the land. It is said there is no sentiment in business—it seems to me that herein there is but little honesty. Such people, if not very full of art, are at least artful.

"I had rather be a dog, and bay the moon, than such a Roman."

The goldsmiths of the fifteenth century, in cutting their incised designs on various surfaces—armour, perhaps, or cups, or plaques—to show the progress of their work, would take impressions of it, by filling it with a viscid ink, and pressing paper on it. These impressions still exist, and are called Niellos. They constitute the origin of copper-plate printing. In the early days of my photographic career, I was called on to reproduce a number of them in the British Museum. I effected this by the carbon process, making the negatives by magnesium light. The recollection of my work recalls to my mind a laughable incident connected with their publication. It was in London, about the year 1870. The publication mostly appealed to a small exclusive Art Club—the Burlington—of which the members were, to a large extent, members of the English nobility—Dukes, and Earls, and Lords of every degree. It was deemed advisable to address a circular letter on the subject to them. I need not remind my hearers that the proper way to commence such a communication is "My Lord, I have the honour to draw your Lordship's attention," and so forth. I had prepared the matter for the circular, and placed it in my partner's hands for the purpose of writing out the necessary copies. It was not thought advisable to print them, and typewriters were unknown

at that time. In due course, the letters were ready for mailing. Fortunately I happened to look at one. My partner, an exact and precise man, conceiving the rules of grammar to be all-important, had argued to himself that our firm—consisting of two people, himself and myself—could not grammatically address any one as "My Lord," so he had commenced all of the letters, "Our Lord."

From the starting point of Niello, copper-plate and steel-plate printing has travelled through the ages; yet this method of printing remains the same as in the fifteenth century. It is, indeed, the only printing method where machines have been found unavailable for the higher classes of work. In spite of numberless efforts, no mechanical device has yet been found to take the place of the ball of the hand in wiping the plate. The idea of the method of printing is simple enough. Lines are incised, or cut, into a steel or copper plate; the plate is rolled or daubed with ink, which is thus forced into the lines. The surplus ink is wiped off, leaving the surface of the plate clean, while the ink remains in the incised lines. Pressure is applied to the back of paper laid on the plate, and the paper, being withdrawn, carries the ink with it out of the incised lines. This is intaglio printing.

A photogravure plate is an intaglio plate where the intaglio is produced by photography instead of by hand.

Photogravures are produced by two processes—one is called the building, or deposit process; in the other, the photogravure plates are produced by etching.

We must bear in mind the behaviour of a steel plate in printing. It is composed of deep, fine, incised lines, out of which the ink cannot be wiped. In a photogravure plate it is different; there are no lines, only the tones and half-tones in broad masses. An intaglio plate is depressed where these tones and half-tones exist. It is plain some method must be adopted to give these spaces a grain, or ink-holding capacity, or else, when the plate is wiped, there would be nothing to prevent the ink being wiped out of these depressions. To obviate this, the printing plate must, as a primary necessity, possess a grain, or ink-holding capacity. In the deposit process, bichromated gelatine is exposed to light under a negative, and a picture obtained—not in light and shade, but in relief and depression. To produce the necessary grain, sand, or powdered glass, or some equivalent gritty substance, has been mixed with the gelatine, and gives a grain to it. On this gelatine-grained picture produced by photography a copper electrotype is deposited or built, such electrotype having all the necessary qualities for intaglio printing. The admirable work of Goupil is done by this method. In the reproduction of works of art it has never been surpassed, though it is fair and proper to add that a large proportion of its merit is due to the amount of exquisite artistic handling and finishing which is put into the plate after the process work has been completed.

The other method of preparing photogravure plates, and by which by far the greater number is made, is by etching. Provision is first made for the necessary grain by dusting the copper plate on which the etching is to be done with powdered asphalt or resin, and heating the plate sufficiently to melt it, these grains of asphalt, of course, protecting the copper during etching, which goes on round them. The copper plate, more or less covered with very fine particles of melted asphalt or resin, is then ready for the reception of the gelatine "resist," properly so called because its function is to resist, in the proper proportions, the action of the acid with which the plate is to be etched. To prepare the "resist," the services of bichromated gelatine are again called into requisition. A sheet of bichromated gelatine is exposed to light under a positive (not a negative, or the subsequent operations would make our final picture a negative), and attached to the grained copper plate by atmospheric pressure. The parts of the bichromated gelatine which have not been acted on by light remain soluble, and are dissolved away with warm water. There remains an insoluble picture of varying degrees of thickness. This resists in varying degrees, according to its thickness, the action of the acid in which the copper plate, with its attached "resist" is now placed for the purpose of etching. When the expert has decided that the etching has proceeded to the right point, the action is stopped, the gelatine "resist" removed, and the plate proved. Do not forget that the necessary grain has been produced by the acid not etching where the asphalt has protected the copper, thus forming small fine grains. Any defects may now be removed, and handwork added to the plate. It is desirable to avoid this as far as possible, in order to preserve the fidelity of the photographic reproduction. It is rarely safe to supplement the work of the artist with that of another hand.

A word about steel facing. After the plate has been proved, and approved, it is ready for printing, but the copper plate would not wear for twenty impressions, if there were no means of protecting its surface. This necessary protection is effected by electric deposition on its surface, of an exceedingly fine, thin coat of steel. When steeled, the plate should yield thousands of impressions. If the steel wears at all, the coating is easily dissolved off and a new coating of steel deposited.

The colour of ink in which a photogravure is printed is optional, but there is a very beautiful method of printing photogravure plates, in which the plate is inked in locally with a variety of colours, in fact, painted, almost as a painter would paint his canvas, with this advantage, that the design—the groundwork—is prepared for him. When he has laid on his colours his picture is transferred to paper. The design or groundwork remains, again ready to be painted.

It may readily be conceived that such a process of printing is slow indeed, two or three impressions a day only being obtained from a moderate-sized plate. Perhaps one is hardly justified in calling it photo-mechanical printing. But it is an art process, and, artistically done, the result fully justifies the labour expended.

I propose showing you later the progressive steps in the preparation of a photogravure plate, as well as a plate inked up in colours, from which you shall see the impression pulled. ERNEST EDWARDS.

(*To be concluded.*)

News and Notes.

MESSRS. HARRISON & SONS, late of 28, Woodhouse-lane, Leeds, photographic apparatus makers, have removed to Rockingham-street, Leeds; Mr. William E. Harrison, practical watchmaker, to 14, Rockingham-street, Leeds; and Mr. John Harrison, engineer's photographer, to Albion-street, Leeds.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION. — Meeting of the Committee at the Registered Offices, 6, Farringdon-avenue, E.C., on Friday, February 8, Mr. Alexander Mackie in the chair.—Several applications for assistance were considered. A grant of 10*l.* was made towards a fund for placing the widow of a photographer in some light business. A loan of 10*l.*, repayable by monthly instalments, was made to a woman photographer. A loan of 3*l.* was made to the widow of another photographer, who is in business for herself, to enable her to redeem from pawn certain apparatus. A printer, who had only had temporary engagements for the last year, asked for a small grant, and the sum of 5*s.* per week for a few weeks was granted. Another photographer, out of work, received similar assistance, at the rate of 10*s.* per week. Application was made on behalf of a lady—reception-room hand and retoucher—who had been some time out of a situation through ill health, but the case was deferred. A sub-committee appointed in October last to deal with one of the applicants made its report. The Treasurer's report was received and passed, and the report of the Committee to the members was considered and drawn up. The fact that the grants and loans during the past year had been equal to three times the income, even with the most strict economy, was discussed at considerable length, and many suggestions for improving the status of the Association, and increasing the interest taken in it by professional photographers, were carefully considered. It was decided to call the annual meeting for February 28, at the rooms of the Royal Photographic Society, 50, Great Russell-street, W.C., at 8 p.m., and to specially invite all who are interested in the cause of benevolence to be present at that meeting.

THE Annual Exhibition of the work of members of the Edinburgh Photographic Society was opened on Saturday, the 2nd inst., with a very successful smoking concert, held in the Society's hall, 38, Castle-street. The Exhibition is fully up to the standard of former years, both in regard to the number of entries and in the quality of the works exhibited, which comprise landscapes, figure studies, portraits, and lantern slides. There are examples of the various processes, from the old and familiar silver print to the modern carbon, besides a large selection of lantern slides. Exclusive of a considerable number of very fine works sent for exhibition only, there are about ninety entries in the eight competitive classes, comprising about 175 photographs and 120 lantern slides. Amongst the non-competitive works are two very fine portraits of the late Colonel C. G. H. Kinnear, the inventor of the modern form of camera bellows, and of the late Mr. John Moffat, one of the fathers of photography in Edinburgh, both being gifts to the Society by Mr. F. P. Moffat, one of the Vice-Presidents. There are also some very beautiful works by Messrs. William Crooke, W. Lamond Howie, James Patrick, and the late Alexander Ayton, jun. The Exhibition is held in the Society's hall at 38, Castle-street, and is now open to the public free every day between ten a.m. and 10 p.m., closing on Saturday, the 23rd inst. The following are the awards in the competitive classes:—Class I. (Lantern Slides).—Charles A. Stitt, silver medal; James B. Young, bronze medal. Class II. (Society's Rambles).—No award. Class III. (Figure Study).—A. Tagliaferro, silver medal; H. L. Gardiner, bronze medal. Class IV. (Landscapes above half-plate).—James R. Roddick, silver medal; William Mitchell, bronze medal. Class V. (Landscapes, half-plate and under).—W. Lamond Howie, silver medal; W. E. Drummond Young, bronze medal. Class VI. (Hand-camera Work).—Edward L. Brown, bronze medal; W. E. Carnegie Dickson, bronze medal. Class VII. (Enlargements).—W. E. Drummond Young, silver medal; Edward L. Brown, bronze medal. Class VIII. (Ladies' Work only).—Mrs. Gilmour, of Montrose, bronze medal.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 2509.—"A New or Improved Pneumatic Releasing Device for Camera Shutters." H. L. C. AUSBUTTEL.—*Dated February*, 1895.

No. 2544.—"Improvements in or relating to Photographic Cameras." Communicated by A. C. Kemper. Complete specification. A. J. BOULT.—*Dated February*, 1895.

No. 2678.—"Improvements in Hand Cameras." J. ASHFORD.—*Dated February*, 1895.

No. 2715.—"Improvements in or relating to Flash Lamps used for Photographic or other purposes." A. A. ARCHER.—*Dated February*, 1895.

No. 2767.—"A New and Improved Attachment for taking Stereoscopic Photographs of Still Life with a Single Camera and Lens." E. A. IND.—*Dated February*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
18	Camera Club	
18	Glasgow and West of Scotland	
18	Halifax Camera Club	Prize Slides.
18	Leeds Photo. Society	*Northern France.* W. J. Warren.
18	North Middlesex	
18	Richmond	*A Chat on Photography.* E. J. Wall.
18	South London	Demonstration of the Carbon Process. The Autotype Company.
18	Southport	Demonstration by Mr. Baldwin (Eastman Company).
19	Birmingham Photo. Society	
19	Brixton and Clapham	Slides by T. J. Bartrop and F. Goldby.
19	Derby	
19	Exeter	
19	Gospel Oak	*Enlarging.* G. A. Powell.
19	Hackney	
19	Hastings and St. Leonards	
19	Keighley and District	
19	Munster	*Snap-shots Across the Atlantic.* A. Newsom.
19	North London	
19	Paisley	
20	A. A. Camera Club	*Sketching* versus *Photographing.*
20	Brechin	
20	Bury	
20	Croydon Camera Club	Photographic Chat.
20	Leytonstone	
20	Manchester Camera Club	
20	Midland	*Mines and Miners.* H. W. Hughes, F.G.S.
20	Photographic Club	*A Toning Process for Platinotype Prints.* A. W. Dollond.
20	Southsea	
21	Birmingham Photo. Society	
21	Camera Club	
21	Ealing	*A Chat about Clouds.* Roland Whiting.
21	Glossop Dale	
21	Greenock	
21	Hull	
21	Liverpool Amateur	*The Working of the Limelight Lantern.* Mr. Anyon.
21	London and Provincial	*Development and Fixing.* J. Cadett.
21	Oldham	
21	Oxford Photo. Society	
21	West London	Lantern-slide Making.
21	Woodford	*Enlarging by Artificial Light.* E. B. Caird.
22	Cardiff	
22	Croydon Microscopical	
22	Holborn	
22	Maidstone	
22	Swansea	
23	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 12, Annual Meeting,—Mr. J. Spiller (Vice-President) in the chair.

THE PROGRESS MEDAL.

The CHAIRMAN read a letter from the President (Sir H. Trueman Wood), expressive of regret at being unable to be present through illness. Sir Henry also said it would have given him great pleasure to have personally presented the Progress Medal to Dr. P. H. Emerson.

In the absence of Dr. Emerson, the CHAIRMAN said the Progress Medal would be forwarded to him. He read a letter from Dr. Emerson, in which the latter gentleman said he appreciated the honour of having been awarded the Progress Medal, which he should always regard as one of the most honourable distinctions.

THE ANNUAL REPORT.

The HON. SECRETARY read the Annual Report of the Council.

The following are extracts:—

The Council have to congratulate the members that Her Majesty the Queen, the Society's first Patron, has been pleased to command that the Society be called in future "THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN."

During the year, one hundred and seven new members have been elected into the Society, and we have lost twenty-six by death and resignation. The following table shows the changes in the number of members that have taken place:—

	Honorary Members.	Life Members.	Ordinary Members.	Non-resident Members.	Totals.
On January 1, 1894	5	68	381	14	468
During 1894, elected	0	5	102	0	107
,, ,, died	0	1	7	0	8
,, ,, resigned	0	0	18	0	18
On January 1, 1895	5	72	458	14	549

Those lost to the Society by death are: Francis Bedford, R. Keene, R. L. Kidd, W. Kirman, Sir G. R. Prescott, Bart., J. Spode, and B. B. Turner. Short obituary notices of these members have been published in the *Journal*.

The Exhibition at the Gallery in Pall Mall was conducted on much the same lines as before, the Council entrusting the selection of the exhibits to a committee, in which the Judges were included. The apparatus was restricted to articles that had not been previously shown, and in most cases to novelties introduced during the year, and, in those cases where the apparatus was not obviously new, the recent improvements were concisely stated in the catalogue.

The following tables compare the details of the Exhibition with those of the few preceding years:—

Year.	Frames.	Photographs.	Portrait and figure subjects.	Landscape and architecture.	Miscellaneous.
1889	640	833	388	360	85
1890	658	808	381	348	79
1891	628	1086	399	508	179
1892	543	1072	458	433	181
1893	336	587	270	247	70
1894	481	679	225	267	187

Year.	Members.	Non-members.	Town.	Country and Foreign.
1889	102	86	84	104
1890	82	81	79	84
1891	74	109	94	89
1892	67	135	105	97
1893	54	106	89	71
1894	65	129	102	92

There were also 152 transparencies (including lantern slides), one case of photo-enamels, and forty-six apparatus exhibits. The number of exhibitors whose works were accepted was 194. There were twenty-four foreign and colonial exhibitors, namely nine sending from the United States, four from France, three from Germany, two from India, two from Italy, and one each from Austria, China, Malta, and New Zealand.

The number of visitors to the last Exhibition was 10,146, as against 11,376 in 1893, and the total receipts from all sources amount to 459*l.* 2*s.* 4*d.*, or 28*l.* 19*s.* 8*d.* less than 1893. There is a decrease on the receipts for admission of 40*l.* 3*s.* 6*d.*, and on the sale of catalogues of 5*l.* 19*s.* There is an increase with respect to advertisements of 9*l.* 19*s.* 3*d.*, wall-space fees of 4*l.* 15*s.*, and commission on sales of 2*l.* 8*s.* 7*d.* The total expenditure was 499*l.* 13*s.* 11*d.*, being a decrease of 28*l.* 1*s.* 11*d.* from 1893. The chief part of this economy is due to the Assistant Secretary undertaking the business of receiving and returning the packed exhibits at the Society's rooms, instead of employing an agent as heretofore. The increase on the item of medals, 7*l.* 5*s.*, is chiefly due to a new die, which was necessary on account of the alteration of the Society's name, and the increased cost of catalogue is due to the extra number of pages.

The incorporation of the Society is now an accomplished fact. As stated in last year's report, our member, Mr. Ince, offered to carry this matter through without cost to the Society except for stamps and printing. Our best thanks are due to him for the attention that he has given to the business. The necessary forms that have had to be observed, and the fact that the holiday season interrupted the progress of affairs, have delayed the completion of the incorporation far more than was originally expected.

The institution of the grade of Fellows, in addition to that of ordinary members, has been made after very careful consideration in response to the often-expressed desire that the Society should take some steps towards the recognition of competency in the practice of photography, and of addition to photographic knowledge. It is believed that the Fellowship of the Society will be of increasing value, and, in throwing it open at first to all the members of the Society, the Council have adopted the course that has been followed by other learned societies under similar circumstances.

The search for a better suite of rooms has been continued, but as yet without success. It is hoped that the Society's improved financial position may soon enable it to obtain premises of a more convenient and suitable character.

The Library has been much enriched by the kindness of some of the members, who have contributed to a special fund, and so enabled the Librarian to acquire many valuable works. Opportunities having fortunately arisen, the sets of several important serials have been completed; notably, those of THE BRITISH JOURNAL OF PHOTOGRAPHY and *Sutton's Photographic Notes*, some of the back numbers of which are very scarce. Forty-three volumes have been presented to the Society, sixty-six acquired by purchase and exchange, while seventy-one serial publications, the yearly volumes of which are bound, bringing the total number of volumes added to the library to 180. The need of more accommodation in the library is beginning to make itself felt, while the utility of a collection of about eleven hundred volumes, almost exclusively upon photographic subjects, is shown by the increasing use which is made of it.

The Permanent Collection of Photographs has received fifteen additions of works from our Exhibitions especially selected by a Committee appointed for the purpose. These have all been generously presented to the Society.

The Museum has received eight valuable gifts. Moëssard's lens-testing apparatus, for which the Society is indebted to Dr. Lindsay Johnson, is more than an addition to the Museum, as it will, doubtless, prove very useful in the laboratory. The Council would, as last year, ask the members to bear this collection in mind when they come across old or otherwise interesting examples of apparatus or processes. When the Society acquires more suitable premises, it is hoped that the Museum will form a very valuable and instructive section of the Society's property. One of our members, Mr. F. Hollyer, has kindly offered to make and present to the Society copies in platinum of portraits of early photographers or of old and historically interesting photographs. It is hoped that considerable advantage will be taken of this offer.

The *Journal* has been issued every month. Three of the illustrations that have been issued during the year have been impressions from printing surfaces prepared at demonstrations given before the Society.

The general balance-sheet compares favourably with that of 1893.

The Council are glad to say that the number of affiliated societies has increased from forty-nine to fifty-one.

The report and balance-sheet having been adopted, votes of thanks were accorded to the Officers and Council, the Auditors, Scrutineers, and to Mr. F. Ince for his services in promoting the incorporation of the Society.

The result of the voting for the new Council was then announced as follows: *President:* Sir H. Trueman Wood, M.A.—*Vice-Presidents:* Captain Abney. Messrs. T. R. Dallmeyer, Andrew Pringle, and J. Spiller.—*Council:* Messrs. Thomas Bedding, J. Cadett, F. P. Cembrano, jun., A. Cowan, T. Sebastian Davis, W. E. Debenham, W. England, Colonel J. Gale, T. C. Hepworth, F. Hollyer, F. Ince, H. Chapman Jones, H. A. Lawrance, A. Mackie, J. W. Marchant, J. W. Swan, J. Traill Taylor, E. J. Wall, L. Warnerke, and H. Wilmer.—*Treasurer:* G. Scamell.

At the conclusion of the formal business, Mr. J. PACKHAM read a short paper descriptive of his method of *Toning Platinum Prints* exhibiting a large

number of prints having sepia brown and red tones. The method is based upon the affinity which the platinum deposit has for certain substances employed for dyeing textile fabrics. The method is fully described in Mr. Packham's patent specification, which will be found on page 793 of our last volume.

PHOTOGRAPHIC CLUB.

FEBRUARY 6,—Mr. F. Haes in the chair.

Mr. Müller was unanimously elected a member of the Club.

Mr. Hastings showed negatives and slides from them. The exposure was fifteen minutes, *f*-8, by moonlight. They were considered very good, the shadows being well exposed.

Mr. Barnes showed comparative tests on plates and films to illustrate that there was not a deterioration in the latent image. One couple was exposed and developed identically soon after exposure; the results were equal. Another couple, after exposure, were packed with the sensitive surfaces in contact with an *unexposed* plate or film. They were developed at a period of two months after exposure, and the results were both good; the film, if anything, had increased in value.

Mr. WELFORD referred to hand-camera exposure by himself upon a landscape plate against the sun. There were two images of the sun on the finder, but the resulting negative showed but one image. His opinion was that the sun was so yellow that it did not cause halation or spots, as is invariably the case when the sun is photographed.

By invitation Mr. Tutton showed a magnificent series of slides (over 100), taken in the Bernese Oberland.

Mr. HASTINGS proposed a vote of thanks to Mr. Tutton, which was carried with acclamation.

It was unanimously agreed that the pictures were unique, and it would require a master hand to pen an adequate description of them.

Ealing Photographic Society.—February 7, the usual monthly Lantern Evening of the above Society was held, Mr. H. W. Peal in the chair.—The lantern was manipulated by Mr. T. Simpson. The first views shown were an excellent series of views of *Ealing—Past and Present*, by Mr. Charles Whiting. These were followed by some microscopical photographs by Mr. Roland Whiting. Then came some very fine flower studies, by Mr. T. Crisp, jun., and also some landscapes by the same gentleman; then an excellent set of views of *Exeter and Neighbourhood*, and some very delicate micro-photographs by Mr. J. W. Huggins, Vice-President of the Exeter Society. These were much admired, although exception was made to the colouring of some of the slides. Next followed some collodion emulsion slides, by Mr. Fryer; the tone of these slides was excellent. Some copies of engravings, &c., by Masters Grimston were then shown; these slides showed much promise. Mr. Simpson showed an interesting series of views, and the meeting concluded with a vote of thanks to Messrs. Huggins, Simpson, and C. Whiting. Owing to the severity of the weather, there was a very limited audience.

Gospel Oak Photographic Society.—February 5.—Mr. W. J. RAMSEY, of the Eastman Photographic Company, gave a practical demonstration with their platino-bromide paper; two landscape and two portrait prints were developed with metol, and also with iron, the results being much admired. Preceding the demonstration, Mr. Ramsey gave some valuable and useful hints as to the management of the paper, and also showed the causes of failures and their remedies. There were also shown several enlargements on this paper, which were very much admired.

Lantern Society.—On February 11 an invitation visit was paid to the works of the Brin's Oxygen Company, which was very much enjoyed and appreciated by the members and their friends. The Manager, Mr. K. S. Murray, explained in detail the processes of manufacturing oxygen, and the plant used in doing this. The operation of compressing the gases and filling cylinders was then shown, and the uses of oxygen for blow-pipe work, limelight, &c., were practically demonstrated. After inspecting the annealing furnaces, laboratory, fitting shop, &c., the various sections of cylinders used, together with the valves, regulators, &c., generally supplied, Mr. Murray showed and explained the operations of cylinder-testing, and went into the question of the precautions taken for the public safety in passing cylinders for commercial use. These were fully endorsed by those present at the meeting, and a very hearty vote of thanks was given to Mr. Murray for the very pleasant and interesting evening he had enabled the members of the Lantern Society to spend.

Putney Photographic Society.—February 4. Dr. W. J. Sheppard in the chair.—Dr. C. WYMAN gave an exceedingly interesting account of a visit to India and Burmah, which was illustrated by a large number of lantern slides. The lecturer had the good fortune to travel under the wing of the Opium Commission, and to travel to India and back on that well-known yacht the *Sunbeam*. His photographic outfit consisted of "an old and trusty Kodak, which, in spite of the heat and knocking about it received, is in as good condition now as it ever was, and a Watson's whole plate brass bound machine with three lenses, viz., Ross's rapid rectilinear, Wray's landscape, and Perken's wide angle while the plates and films used were Paget's, Wratten's, Fitch's, and Eastman's." Leaving Southampton September 22, 1893, the following places were touched: Gibraltar, Spezzia, Port Said, Suez, Aden, and Colombo, about a week being spent at each, the distance covered being 8464 miles, of which 3752 were done under sail, and 4712 under steam; the longest run was 240 knots under sail. On showing a view of the river Hoogli, the lecturer mentioned its navigation as being very difficult owing to shoals and quicksands, only six inches of water under some of the large ships; shoals shift every day; numerous wrecks, plenty of alligators and tigers on the banks, and jungle very thick. On the map of India being thrown on the screen, he said those who have never been to India can have very little real idea of the size and vastness of the country; 2000 miles across and peopled by between two and three hundred millions of people, it is about the same size as the whole of Europe with the exception of Russia, and with rather a larger population, and like Europe contains numerous different races of people, speaking languages as widely different from one another. It is not one country but a number of countries, and to this fact we owe our present position there, for, incredible as it sounds, there are only some 100,000 Englishmen to keep the 217,000,000 natives in subjection, and in travelling through India this small proportion strikes one most forcibly. While the Commission were holding their sitting in Calcutta the lecturer took the opportunity of visiting Burma, the route taken being Rangoon, some interesting slides being shown of elephants at work shifting heavy pieces of timber. One of the chief sites of the place being the Shwe Dagohu Pagoda, this being a solid bell-shape mass of masonry, 370 feet high, and a quarter of a mile in circumference, completely covered with gold leaf at a cost of about 7000*l*., and surrounded by resting houses, chapels, and shrines, containing hundreds of statues of Buddha, some of colossal size. There is also a big bell, the third largest in the world, weighing forty-two tons. From Rangoon, Mandelay was reached by train, among other slides shown being one of Theebaw's palaces, supposed by the Burmese to be the centre of the universe. Here an interesting group of Burmese priests was taken, a great difficulty being to persuade them to stand for their photographs. Leaving Mandelay he proceeded up on the Irrawaddy to Bhamo by steamer, a distance of 200 miles. River broad and shallow the first part, steamers frequently aground, while during the rainy season it rises eighty feet. Bhamo is quite a junction; here people from all parts meet. The lecturer here showed a photograph of some Kaytchyens which quite seemed to bear out the description he gave of them, viz., short, thick-set, dirty, more than half savage, clothes embroidered with shells, beads, and wool, very suspicious; women wear leather bangles round waist. These half-savage people all showed great dislike at being photographed, and it was only by the co-operation of the lecturer's native servant he succeeded in obtaining a front view of them. Back to Calcutta, whence a trip was made to Darjeeling, 7000 feet up, by railway, a wonderful piece of engineering from which gorgeous views were obtained of the Himalay,as with Kinchinjinga 28,156 feet high, at a distance of forty-five miles. Mount Everest could be seen at 120 miles, distance. At Darjeeling were to be seen a great number of people from all the surrounding countries. Among other places visited were Patna, with its many temples and a large number of fakirs, or religious mendicants, many of whom presented most loathsome spectacles, Benares, Sarnath, Lucknow, Delhi, Agra. Among the views of this place was that of the beautiful Taj Mahal, built of pure white marble, which occupied seventeen years in building, and cost 20,000,000 rupees. Gwalior, Jeypore, Ajmere—at this latter place was shown one of the most ancient mosques in India, the date of its construction being 1200 A.D. Mount Abu, view of oldest known Jain temple in India, eleventh century, most elaborately carved white marble. Ahmedabad—at this place a photograph of a tree was taken, which to all appearance was covered with some fruit, but in reality was hundreds of bats, or flying foxes, suspended from the branches asleep. Khandala, Karli—here was taken an interesting photograph of a temple cut out of solid rock and about 2000 years old. Golconda, Bijapur. Here is the Gol Gombay with its immense dome, which is second only to St. Peter's at Rome, and covers a space of 18,225 square feet. From Bijapur the lecturer's party returned to Bombay, where the *Sunbeam* was awaiting them, and after an uneventful voyage arrived in England on April 8, 1894.

Richmond Camera Club.—On the 28th ult., Mr. WILLIAMS read a paper on *Metol as a Developer*, claiming for it great power of obtaining detail in under-exposed negatives and shadows, while the addition of hydroquinone gave the required density. On February 4, Mr. Cembrano presided over a large meeting, at which the first business was the presentation to the popular Vice-President, Mr. Ennis, of a testimonial in recognition of his invaluable services to the Club during the three years he was Hon. Secretary. The testimonial, which was subscribed for by a large proportion of members, took the form of a Hume's cantilever enlarging apparatus, and was presented by the PRESIDENT in a few appropriate words, and gracefully acknowledged by Mr. ENNIS. The next business was the lantern-slide competition, in which, unfortunately, there was only a limited number of competitors, several of the best workers appearing to consider the competition "not good enough" for them, while beginners, presumably, thought that they were not good enough for the competition. There were five classes—Landscape, Marine, Architecture, Figures, and Animals, and Miscellaneous—from which slides were to be entered in sets of three. Forty-three sets were entered, and honours were secured by Messrs. Davis (four first), G. A. Bickerton (one first and two seconds), Hilditch, Gibson, and Child (one second each). Mr. C. G. Hards, a former member of the Club, was the Judge.

South London Photographic Society.—February 4, the President (Mr F. W. Edwards) in the chair.—Mr. R. CHILD BAYLEY attended and gave a demonstration of *Plate-making for Amateurs*. The demonstrator first described the apparatus and materials required, after which he proceeded to explain and illustrate the preparation of the emulsion, and the coating. It was absolutely necessary that the plates to be coated should be perfectly cleaned before the melted emulsion was spread upon them. After coating them, plates are placed on a levelling slab to be set, after which they are placed in a "drying cupboard" to dry. The drying cupboard used by the demonstrator was sketched and described. The preparation of plates can be conveniently divided into three divisions, spread over three evenings or periods, viz., the preparation of the emulsion, the coating of same, and the coating and drying of the plates.

Bournemouth Photographic Society's Exhibition.—This Exhibition was held last week. A local paper says: "In the classes open to members only there were 122 exhibits. The best class was the first one (landscapes, seascapes, and architecture), and the bronze medal was taken by Miss E. Skirrow, with three Devonshire studies. An extra bronze medal went to Mr. Ernest Greenleaves, with an extremely well-arranged picture of the north aisle and piscina at Christchurch Priory, the composition and *technique* of the stonework being remarkably good. Mr. Harry E. Coates secured an honourabl

mention with another interior from the Priory, Christchurch, *The Draper Chantry*, a better rendering of texture, but not quite so good an arrangement of light and shade as seen in the previous picture. Other pictures in this class which deserved mention, although not receiving awards, were Mr. R. W. Copeman's Salisbury Cathedral views, the Rev. J. R. Husband's views of North Wales (especially a moreland view with very good atmospheric effect), and Miss E. Skirrow's *Three Studies* (especially an exterior cottage view), which were much admired. The exhibitors also included Mrs. Boyd, Miss Wingfield Digby, and Messrs. R. T. Banks, F. G. Hopkins, R. Grimsley, T. Lee Lloyd, J. H. Stanley, H. N. Coates, A. Youngman, E. R. Logan, and G. M. Robins. In Class II. (portraiture), the bronze medal was withheld, as there were practically only four exhibits, evidently all by one worker, Miss Hastings Lee, to whom an honourable mention was given for the portrait of a flower-girl, which was the least formal in treatment. In Class III. (for members' enlargements) there were nearly thirty exhibits, and each was accompanied by the print of the original negative. The bronze medal was awarded to Mr. Bertram Payne for a snow picture of a well-known spot near Wick, Christchurch. Mr. Henry Sharpe's *Notre Dame*, the best picture in the class, was disqualified, the Judges holding that it had been enlarged from a washed drawing. An honourable mention was given to Mr. E. Greenleaves for his quay scene, *Watching and Waiting*, instinct with realistic life. Mr. G. C. Primavesi also showed some good enlargements. This class—a very promising one for amateur work—was declared by the Judges to be 'all-round good.' Class IV. was for hand-camera and instantaneous pictures, and here again there was some very creditable work. Mr. R. W. Copeman was awarded a bronze medal with *Feeding his Pets* (a child, attended by its mother, feeding fowls in a farmyard), a pretty bit of light and shade work. Miss Lowndes secured honourable mention for her *Four Italian Farm Scenes*. The dog pictures, *Messrs. Dodson and Fogg*, shown by Mrs. Hastings Lee, were very amusing and replete with life. Other exhibitors in this class were Messrs. G. P. Symes, G. M. Robins, R. Grimsley (whose *Pier, New Quay*, was a very well-combined picture of sea and sky, and gave promise of some good work), and R. T. Bankes. Class V. (for beginners, all work having been done during 1894) was, perhaps, in the circumstances, the strongest class in the show, and was much commended by the Judges. Mr. T. Hodson's *Winter near Bournemouth* was awarded the bronze medal, but this was run very close by the same worker's other scene, *Views near Home*. Mr. F. E. Bilson was honourably mentioned for his well-chosen local view, and similar notice was taken by the Judges of Mr. Primavesi's excellent snap-shot views of various points of interest observed in a trip to Cherbourg by the s.s. *Monarch*, *Monday. June* 25, 1894. In the lantern slides (sets of six of each) Mr. J. H. Stanley secured the bronze medal, and his son, Mr. J. H. Stanley, jun., the honourable mention, their exhibits being the best respectively of the eighteen sets exhibited. The other exhibitors included the Rev. H. Lee, Mrs. Boyd, Messrs. E. Greenleaves, R. J. Banks, A. H. Vernon, H. Sharpe, and F. F. Boyd. There was an extra class, in which a silver medal was offered for the best set of lantern slides shown at the Exhibitions by any member of the Society. The silver medal was won by Mr. H. A. Miell (Miell & Ridley). In the first of the open classes for any subject, the gold medal was awarded to Mr. J. Kinson Taylor, of Manchester, with a very artistic picture, entitled *Dawn*, in which the distances, atmospheric effect, and general tone of the subject were simply perfect. The same worker's *Hampshire Home*, which has received awards elsewhere, was also much admired. The silver medal went to Mr. A. G. Tagliaferro (London), for *A Cut Finger*, a very realistic cottage scene, in which Grandma is intent on binding the cut finger of a crying child; the figures, natural, easy, and suggestive. Mr. Percy Lankester (Tunbridge Wells) and Mr. Joseph Chamberlain (Tunbridge Wells) were honourably mentioned for their picture of *Buckhurst Wood* and *Egyptian Studies* (very fine work) respectively. Messrs. Miell & Ridley showed some very fine technical work in their interior scenes and animal studies, and other exhibitors included Miss H. Padgett, Miss K. M. Holme, and Messrs. A. H. Bishop, E. P. Hart, T. B. Sutton, J. H. Coath (some charming and humorous studies of children), W. Hazel, F. W. Cory, W. A. Lucas, F. T. Corbett, E. Baynes Rock (who sent his *Reverie*, a study by ordinary lamplight, awarded second prize out of some 20,000 pictures in the *Graphic* competition), C. Sweet, A. Eden. In the second Class, Mr. Percy Lankester was to the front, winning the silver medal for portraiture with three pictures, *A Brown Study*, *Love's Awakening*, and *Yes or No*, and Mr. W. J. Reed secured honourable mention with his carbon *Studies of Children*. The silver medal in the open enlargement class was withheld, the Judges finding that a good deal of the work had not been done by the exhibitors."

Gainsborough and District Camera Club.—February 6.—The President (Mr. F. J. Cribb) presided over a good attendance. Mr. A. C. Baldwin gave an account of the formation of the English branch of the Eastman Company, and also of the several specialities of the firm, viz., Kodak and Kodet cameras, Solio (glossy and matt), bromide, Nikko, and platino-bromide papers, &c., and, after his address, gave a practical demonstration on *The Toning of Solio, both Glossy and Matt, by the Potassium Chloro-platinite Bath.* In his remarks, the demonstrator spoke of the best ways of manipulating the various papers, and verified his statements in the case of Solio by the successful result of the demonstration, a most beautiful tone being obtained. A discussion followed, and the usual vote of thanks closed the proceedings.

Leeds Camera Club.—One of the most valuable and interesting papers of the session to amateur photographers was given on Thursday last, at the rooms of the Leeds Camera Club, 165a, Briggate, Leeds, by Mr. S. Margerison, the subject being *Photography with a Purpose.* In introducing the subject, Mr. Margerison pointed out that the failing of many amateurs was the indiscriminate snap-shotting and the photographing anything and any how, with the chance of getting some good photographs, but generally a great number of bad ones. He did not advise the veritable beginner to commence straight off with the purpose of only photographing one class of work. He had better experiment first, as well as read up suitable books, and find out the subject nearest to his taste; then, when he had become something of an adept, he could choose out a subject or class of subjects, and work that up, becoming, perhaps, an expert in that line, where, in indiscriminately tackling anything that came to hand, he would never be more than a mere dabbler. To those with a taste for landscape picture-making he would recommend the reading of Mr. Robinson's books on this subject, to the end that, when one has decided to go in for landscape photography, he might know a subject with art in it when he saw it. As to photographing with a purpose, the lecturer mentioned that those with artistic tastes and ideas might take a subject like a river, and make a series of photographs from source to mouth, with the result that he would have a set of pictures valuable and instructive, as well as most interesting; or a series of farm scenes, country lanes, animals, street groups, boys' games, country costumes, outdoor occupations, would have the same result. To those with astronomical tastes there was some scope for photographic studies. Only recently some good photographs of the region in which lies the great Orion nebula had been produced without any expensive astronomical instruments, but with a simple portrait lens. To the geological enthusiast photography with a purpose could also be applied. To the botanist a series of flower studies, groups of leaves, or tree studies, would be interesting and most valuable as showing the different growths and formations of these subjects. To the students of the microscope, the medical student, and the entomologist, photography, if done in a systematic way to an end, might have a valuable result. The antiquary or architect has in photography the means of reproducing old specimens of architecture, which are fast decaying away, and a set of views of such subjects would become priceless as time went by. Mr. Margerison here pointed out that, with a given subject (take Kirkstall Abbey, as being near at hand), the photographer, with an art purpose, would choose a view of it to get breadth of effect. The antiquary would want detail in the stonework, and not heed the picturesque study of the Abbey, and yet each would produce a valuable result; whereas the indiscriminate photographer, with no fixed idea of what he wanted, was most likely to get something of a sort of cross between the two—useless and uninteresting. There was plenty of room in a town for systematic photography—in sets of views of buildings, principal streets, places of note, &c.; and the lecturer threw out a suggestion that a society of photographers, such as he was addressing, might take up a photographic survey of a town or given district, and work that up with an excellent result. In conclusion, he said he had not gone into detail as to taking the subjects he had mentioned. His object was to put the idea to amateurs for what it was worth, and if he thought any single amateur went in for systematic photographing, and gave time and study to a given subject, through his few words, instead of rushing heedlessly on, and snapping anything that came within range, he would feel amply repaid. About sixty lantern slides, being a few from several similar series as mentioned, were thrown on the screen, and the interest and instruction in them showed that at least the idea of systematic "photography with a purpose" was at least well worth thinking over, and the applause which was given to Mr. Margerison at the close showed that those photographers present followed his idea and appreciated his address.

Leeds Photographic Society.—On Thursday evening, the 7th instant, a *conversazione* was held by the members of this Society in the Club's rooms, Mechanics' Institute, Leeds. After coffee had been served, the members adjourned to the Lecture-room, where Mr. J. H. Walker delivered his Presidential address. He congratulated the photographers of Leeds that, notwithstanding the inauguration of another successful photographic club in the city during the past year, still the Society, the oldest in England, had largely increased its membership roll and its balance in the hands of the Treasurer. He welcomed as new members several prominent citizens, who, though not strictly photographic enthusiasts, might, and would, aid the technical members from many points of view. He pleaded that members should endeavour to depict the artistic sides of their subjects, and stated that, during the coming session Mr. W. Thomas and Mr. Renard, of the School of Art, would give lectures on this branch. Finally, he begged older members to continue the practice of attending the meetings regularly, entering into the discussions, and allowing the juniors to profit by their experience. Afterwards a concert party, organized by Mr. George Atkinson, delighted the majority of the visitors, whilst the more enthusiastic had a large number of the Sciopticon Company's Woodburytype slides passed through the lantern. Mr. Washington Teasdale entertained the smokers in the dark room.

Rotherham Photographic Society.—February 6, Dr. Baldwin presided.—The Hon. Secretary reported that the arrangements for the Sixth Annual (non-competitive) Exhibition, fixed for Monday and Shrove Tuesday, February 25 and 26, were in a forward condition. In addition to the display of members' work, there would be a loan collection, and the first display of prints resulting from the photo-survey scheme for the Rotherham district. The Society continues its connexion with the affiliation of the societies, and the President (Dr. Baldwin) and the Hon. Secretary (Mr. H. C. Hemmingway) have been reappointed delegates.

Sheffield Photographic Society.—The usual monthly meeting was held on the 5th inst., when the President, Mr. Firth, occupied the chair. The usual business was transacted, and the Judges for the February competition appointed, their award being again given to Mr. Lygo for a well-executed platino-bromide print of Lincoln Cathedral. Mr. Hibbert showed a new view-finder with which the image can be clearly seen in strong sunlight.

Weymouth and District Camera Club.—Notwithstanding many adverse circumstances (owing to various entertainments and the inclemency of the weather) under which the general meeting of this Club was held, on Wednesday evening at Messrs. Milledge's sale rooms, there was a numerous attendance. Letters were read by the Secretary from several gentlemen who were unable to attend, and the business of the evening was proceeded with, namely, the adoption of a code of rules for the conduct of the Club; the election of officers by ballot (rendered necessary by the rules) to serve for one year, viz., President, Vice-Presidents, Secretary, Treasurer, Auditor, Librarian, and a Council of five members. In the absence of the President, owing to two prior engagements for the evening, the Vice-President read a code of rules, which were discussed and adopted. The election of officers and Council resulted as follows:—*President:* B. Browning, Esq., R.N., F.C.S.—*Vice-Presidents:* Mr. C. F. Hope, M.R.A.C., F.C.S., Colonel Palmer, and Rev. J. Sealy Poole.

—*Council:* Rev. J. H. Moriarty, Dr. DuBoulay, Messrs. W. G. Cox, C. J. Gibbs, and E. Flisher.—*Librarian:* Rev. E. C. Bennett.—*Auditor:* Mr. Zilwood Milledge, C.A.—*Treasurer:* Mr. H. Wiseman.—*Secretary:* Mr. W. H. Butt. The next general meeting will be held at Messrs. Milledge's sale room, 74, St. Thomas-street, on Wednesday, February 25, at eight p.m., when an inaugural address will be given by the President, and some objects of interest exhibited. The Treasurer and Secretary will then be prepared to receive names of intending candidates. The entrance fee for the first twelve months is 5*s.*, and for the second twelve months 10*s.*, and an annual subscription of 5*s.* A copy of the rules and constitution of the Club may be had on application to the Secretary, whose address is Wadham House, Weymouth.

Edinburgh Photographic Society.—The members of this Society are at present exhibiting their work at the Rooms, 38, Castle-street. The Exhibition is a modest one, though to amateur photographers the pictures on view will doubtless possess artistic interest. If nothing in the Exhibition appeals to the ordinary visitor as of outstanding significance, the photographs with which the walls have been hung show creditable skill in the use of the camera, and a few of them bear evidence of artistic leanings. From snap-shots to more ambitious portraiture, the Exhibition is varied in the choice of subjects, and there are illustrations of the various processes and styles through which photography has passed in latter-day development. Mr. William Howie has sent two large photographic landscapes—the one *Balmoral Deer Forest*, and the other, *Glencoe Mountains*—both taken when the hills were clad in snowy vestments. Mr. James Patrick has forwarded a series of plates depicting country life and rural pursuits. Hanging in the same section are an artistic portrait of a lady with harp, and a likeness of the late Colonel Kinnear. Two pictures that attract notice for their fine effects are *The Ebb at Noon* and *Beside Still Waters*, and equally charmingly effective are two moonlight scenes. *When the Evening Sun is Low* is a pretty view of a placid lake with reeds in the foreground, and a church amid woods in relief in the distance. The artistic results obtained by the Scott photo-mechanical process are shown in several interiors. The Nungate, Haddington, and Dryburgh Abbey are the subjects of well-developed pictures by Mr. E. S. Galletly. A somewhat striking effect is seen in a photograph of Duddingston Loch, with the sun breaking through the mists. *Auchty-six* is the title given to a bust portrait of a smiling, hoary, bewrinkled octogenarian. *Bits near Edinburgh* is a series that merits attention for happy combinations of beauty and situation, and something similar may be said of the pictures of Killin. Cathedrals and castles, golf links and golfers, churches and Clyde steamers, hills and hawkers, pastors and picnic parties, still life and statuary, and a variety of other subjects, allied or otherwise, have been "taken" for the purpose of this Exhibition and its accompanying competition, and the results are seen on the walls. The following are the awards in the competitive classes:—1. Lantern Slides.—Charles A. Stitt (silver medal), James B. Young (bronze medal). 2. Society's Rambles.—No award. 3. Figure Study.—A. Tagliaferro (silver medal), H. C. Gardiner (bronze medal). 4. Landscapes above half-plate.—James R. Roddick (silver medal), William Mitchell (bronze medal). 5. Landscapes, half-plate and under.—W. Lamond Howie (silver medal), W. E. Drummond Young (bronze medal). 6. Hand-camera Work.—Edward L. Brown (bronze medal), W. E. Carnegie Dickson (bronze medal). 7. Enlargements.—W. E. Drummond Young (silver medal), Edward L. Brown (bronze medal). 8. Ladies' Work only.—Mrs. Gilmour of Montrave (bronze medal).

Photographic Society of Ireland.—January 24, Mr. Alfred Werner (Vice-President) in the chair.—A lecture entitled *Innocents Abroad* (with camera) was delivered by Mr. V. E. Smith, and slides were shown, some of which were taken by himself, others by Mr. Brown. Over 140 pictures were thrown on the screen, the majority being very good, and were descriptive of a tour on the Continent made by those gentlemen last summer, and which comprised views from such places as Rotterdam, Nuremberg, Munich, and places along the Rhine, also some beautiful views in the Tyrol. A very good muster of members and their friends enjoyed a pleasant evening, thanks to the "Innocents" and their work abroad.

FORTHCOMING EXHIBITIONS.

1895.		
February 15, 16	Photographic Society of Ireland.	
March 25–30	*Brixton and Clapham Camera Club. 11, Corrance-road, Brixton, S.W.	F. W. Levett,

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE SPEED OF PLATES.

To the Editor.

Sir,—We are rather amused at Mr. James Cadett's letter which appeared in your issue of the 8th inst. In reading it one would imagine that Messrs. Hurter & Driffield had made some change in their system of the speed determination of plates. Such is not the case, as far as we are aware, and we certainly should know, having been the first plate-makers to introduce the system, and having worked it for four years to the satisfaction of Messrs. Hurter & Driffield. The fact is, Messrs. Hurter & Driffield have found it necessary to insist that those who make use of their names and of their system shall express the speed of the plates in their units, and to facilitate this they have instituted a standard developer for speed-testing purposes. Any other speed numbers given beyond this will be at the plate-makers' sole responsibility. Should any of your readers be interested in Messrs. Hurter & Driffield's system, we should be very pleased to send to them, without charge, some pamphlets on the subject.—We are, yours, &c.,

Marion & Co.

THE BENEVOLENT.

To the Editor.

Sir,—We send you herewith report of the last meeting of the Photographers' Benevolent Association that will be held before the annual general meeting on the 28th of this month. We hope to send you balance-sheet and Committee's report in a day or two. We closed last year with a balance of only 58*l.* 10*s.* 6*d.* in hand. We distributed last year in grants and loans three times the amount of our income. We granted at the last meeting 27*l.*—half the available funds. We hope every one who is interested in the Association will attend the annual meeting, and we specially invite those professional photographers who have not yet supported the Association, although the whole of its grants are made to professionals.—I am, yours, &c. (for the Committee),

February 11, 1895. H. Snowden Ward, *Hon. Secretary.*

ALIEN SKIES.

To the Editor.

Sir,—Replying to Mr. Walter G. Orme, the sentence he refers to obviously contains a slip; the lens for sky should, of course, be of slightly *shorter* focus than that used for landscape. Respecting "J. E's." difficulties, the celluloid is *not* coated, but used transparent; the wet film is *not* hurt by applying celluloid to it, providing reasonable dexterity is used.

Much as I should like to do so, I cannot at the moment enter more fully into the details of this interesting procedure in slide-making, but I feel sure that all who are tolerably experienced in making lantern transparencies will have no difficulty in applying the directions which "J. E." considers are "such a complex business."—I am, yours, &c.,

Hector Maclean.

EXHIBITION AT ROTHERHAM.

To the Editor.

Sir,—I should esteem it a favour if you could call attention to forthcoming exhibition on February 25 and 26 in St. George' Rotherham. It is the sixth annual effort. Thanking you in an ici tion,—I am, yours, &c., H. C. Hemmingway, *Hon. Secretary.*

6, *Stanley-street, Rotherham, February* 9, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Pedestal balustrade and steps, good as new, in exchange for whole-plate French portrait lens.—Address, E. Lewis, 9, Stratford-road, Wolverton, Bucks.

Wanted, complete outfit, half or whole-plate Lancaster's preferred. Will give some backgrounds painted as desired.—Address, E. A. Rigby, Artist, 12, Eustace-street, Dublin.

Will exchange handsome pure-bred collie dog, nine months old, for photographic apparatus to the value of 2*l.*—Address, J. Phillips, 131, Tower Hamlets-road, Forest Gate.

Will exchange collie dog, nine months old, or a cabinet burnisher in good condition, for studio stand or background (interior).—Address, J. Crawford, 55, Kennington-road, Westminster.

Large telescope (5 ft. 6 in.) with vertical and horizontal motions, three-inch O. G., one "terrestrial" and one astro eyepiece, on garden tripod. Wanted in exchange large camera, 8½×6½, 10×8, or 12×10, with slide and lens.—Address, H. Steel, Photographer, West Brighton.

Will exchange balustrade with extra base and vase, cost 6*l.*, for whole-plate studio camera or larger; also exterior background, 8×8, on heavy roller, with patent ends and brackets, cost 50s., for 12×10 or larger old pattern bellows camera, one slide, or exchange for interior same size; extra rapid *carte-de-visite* lens by Cook, quarter-bellows camera, one double slide and stand by Lancaster, quarter-plate hand camera, five single slides, focussing screen, rack and pinion, exchange for backgrounds or accessories.—Address, B. PEARCE, Machynlleth.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

H. RENDREW.—Apply to Mr. Hawkins, 50, Grafton-street, Tottenham Court-road.

V. ST. C. S. (Côtes du Nord).—Either form of studio is good. But for our own part we prefer that designated as No. 1. No. 2 is also a favourite form with many.

TROUBLED.—The silver bath is far too weak. You cannot expect to get a vigorous enlargement with thirty grains of nitrate to sixteen ounces of water.

A. LEVY.—We cannot explain why the phenomenon occurs, unless the low temperature has something to do with it. Perhaps a little more sodium sulphite in the developer might help matters.

PLATINOTYPE.—It is illegal to reproduce copyright works for any purpose whatever. If you write to the publishers, explaining for what you require copies for, permission will frequently be accorded.

RIBER.—The lens mentioned will be suitable for portraiture, but will be slower than a Petzval portrait lens, when both are employed without stops. A lens of the Euryscope form will serve for groups.

T. GODSON.—The most useful lenses for general stereoscopic work will be a pair of about four and a half inches focus of the rapid type. You might if you choose supplement these with a pair of five and a half or six inches focus, of the landscape type—single lenses.

R. H. H.—From the data furnished we can give no opinion whatever of the peculiar markings. Send us full particulars of the method of working, and also one or two of the prints. It is quite probable that the cold weather may have something to do with the trouble.

AMANTE.—1. Consult the advertisement columns. It is strictly against our rule to recommend any particular maker's goods. 2. If you mean simply a dark-room lamp, with electric light, any of the dealers will supply it. This query is somewhat vague, as you say "for half-plate prints."

PRIVATE.—We should certainly advise the position that permits of the longer studio, notwithstanding that the light will be a little more difficult to manage. With the shorter studio it will be found impossible to take full-length portraits and groups with good perspective. For the printing room choose the north aspect.

J. A. MARTIN (Fleetwood).—1. Over-exposed. The lens does not appear to possess much covering power, and was probably used at too large an aperture. The development might have been cleaner. 2. Either out of focus, or the original was unsharp. 3. Out of focus and flat, probably due to slight over-development.

R. S. O.—From the behaviour of the prints we suspect that they were mounted with gelatine, in which case they will not be easily removed by soaking them even for six hours in cold water. If gelatine were the mountant, soak the prints for a few hours in cold water, then transfer them to warm water, say, about 120°, when the prints will easily be removed.

THOS. MAY.—In producing carbon pictures on opal glass no preparation, or substratum, is necessary; but the glass must be perfectly clear in order to secure perfect adhesion when dry. If the plate be well scrubbed with a brush and soap and water, or soda and water, and then well washed under the tap, that is all that is required. A substratum of any kind degrades the opal surface. The pictures should not be varnished.

PROCESS.—There is a work on the subject by Schnauss. Any photographic dealer will procure it for you.

A. O. X.—The snow pictures are very good as photographs, but there has been an unfortunate choice of subjects, unless they are of some personal interest. They would look much better, and more in keeping with the scenes, if they were printed on matt paper, and were of a cold black tone. Reddish-brown tones, on highly glazed paper, are scarcely adapted for snow effects. We presume you wanted plain criticism, and so give it.

T. R. C. asks how he can "easily pick up the wet-collodion process for mechanical purposes." This one process is one that is not readily "picked up," it has to be learnt. The quickest way will be to get some proficient to teach it. Failing that, obtain some of the old standard works on the method, and work according to them till proficiency is acquired. A series of articles on the collodion process appeared in this JOURNAL last year.

C. TOMLINSON.—We are not sure if there are any collodio-bromide plates for negatives now in the market or not. We believe they are not now made for sale. The most likely firm we know of to supply them is Messrs. Wratten & Wainwright. Mr. W. Brooks, of Reigate, it just occurs to us, will very likely make them to your order. We cannot help you further, except by saying, Try your hand by making them for yourself.

A. RUST.—The best method of removing the film from a broken negative is to immerse the plate in a very dilute solution of hydrofluoric acid. Then the film will be detached, and may be floated on to another piece of glass. Care must, of course, be taken that the film is not broken. It is a good plan to place the broken negative film upward on another plate of glass for handling, and immersing in the acid. The new glass may with advantage be coated with a thin solution of gelatine, and, after it is set, the detached film floated on to it, then perfect adhesion will be ensured.

LONDON, S.W.—We cannot answer as to whether the copyright of the portrait has been registered or not. The only way of knowing is by searching the register at Stationers' Hall. It is not necessary that a picture be marked copyright, if it is copyright. Any one who copies a portrait, without first ascertaining whether it is copyright or not, runs considerable risk. We may say, however, that we believe the firm in question make all the portraits of celebrities they publish copyright before they are issued.

R. HUDDLESTONE writes: "I should esteem it a great favour if you could kindly give me a really reliable formula for mounting gelatine prints in optical contact on glass as opalines. I have tried many variations of gelatine as instructed, but find that in a few days the print leaves the glass. I have also tried mounting without gelatine immediately the prints are taken from washing water, but the result is always the same. Prints were toned in sulphocyanide or acetate baths without alum. Backs were put on with common glue, and latterly with Le Page's glue, but the back always seems to pull off the print, no matter how careful one is. No doubt there is a remedy, and, if so, I should be very glad to hear of it."—Possibly the surface of the glass has not been absolutely clean; that might account for the prints slipping. We should advise you to make sure that the glass is perfectly clean. Mount the print with a thin solution of gelatine, and allow it to dry; then attach the back with glue applied to the edges only.

E. W. C. writes: "Might I ask if you could give me through the JOURNAL any information of photography in Switzerland, especially with regard to the exposure necessary for snow scenes according to the altitude from which they are taken. Such advice as I find is very conflicting, *e.g.*, Mr. C. Dent writes, 'Use slow plates, and give as brief an exposure as possible.' Captain Abney points out in the *Alpine Journal* that, owing to the decrease in number of particles in the atmosphere, refracting blue and violet rays, the higher you ascend the longer the exposure, lengthening it in cases to two and a half times, unless my memory fails me. On the other hand, a contributor to the ALMANAC, who speaks of his snow scenes as much admired, says that, working with ordinary plates at *f*-32, he exposed for one twelve-hundredth of a second. I presume that, in photographing distant mountains, no actinometer or exposure meter would be of any use, since they are (am I right in saying so?) based on the assumption that the actinic value of the light on the object photographed is equal to that at the places whence the view is taken. I shall be much obliged if you could give any suggestions."—Will some reader kindly reply to this?

CONTENTS.

	Page
ARTISTIC BACKGROUNDS IN PORTRAITURE	97
THE SWING BACK IN PORTRAITURE	98
A SIMPLE AND PRACTICAL PHOTO-ETCHING PROCESS. By W. B. BOLTON	99
CONTINENTAL NOTES AND NEWS	101
DECADENTS AND THE SALON. By Apς	101
SILVER IN ALBUMENISED PRINTS. By EDWARD DUNMORE	101
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—III. By T. N. ARMSTRONG	102
PHOTO-PROCESS WORK. By JOHN HISLOP	102
COLOUR PHOTOGRAPHY. By F. E. IVES	103
PHOTO-MECHANICAL PRINTING PROCESSES. By ERNEST EDWARDS	105
NEWS AND NOTES	107
RECENT PATENTS	107
MEETINGS OF SOCIETIES	108
FORTHCOMING EXHIBITIONS	111
CORRESPONDENCE	111
EXCHANGE COLUMN	111
ANSWERS TO CORRESPONDENTS	112

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NATURALISTIC FOCUSSING.

The name of Dr. P. H. Emerson has so long been intimately associated with the term "Naturalism" in connexion with photography that we necessarily have to draw on what he has done and written on this subject, more especially as his writings and teachings have been endorsed by the Royal Photographic Society, who have awarded him their progress medal, this being in acknowledgement of their being, in the Council's estimation, the most important addition to their previous knowledge that has been made during the last three years.

Now, "What *is* naturalistic focussing?" let us imagine to have been asked—as, indeed, we have been, and that repeatedly. It consists, roughly speaking, in focussing, upon the principal object in the scene being photographed, allowing all others to be subordinate as regards sharpness. "The principal object in the picture," says Dr. Emerson, "must be fairly sharp—just as sharp as the eye" (whose, and what kind of eye?) "sees it, and no sharper; but everything else, and all other planes of the picture, must be subdued, so that the resulting print shall give an impression to the eye as nearly identical as possible to the impression given by the natural scene." This constitutes, in the main, the teachings of Dr. Emerson as founder of the new school. But here we must observe that, so far from being a new doctrine, it is the very oldest teaching of the Art Section of the founders of the now Royal Photographic Society, who, like our modern art teachers, declaimed, and properly so, against the idea of placing every unimportant bit of scenery in sharp focus.

In the very first paper that was read before this Society, in February, 1853, the Vice-President, Sir William J. Newton, said that he did not conceive it to be necessary or desirable for an artist to represent or aim at the attainment of every minute detail, but to endeavour at producing a broad and general effect, by which means the suggestions which nature offers, as represented by the camera, would assist his studies materially; and for that purpose he did not consider it necessary that the whole of the subject should be in focus; on the contrary, he had found in many instances that the object is better obtained by the whole subject being a little out of focus, thereby giving a greater breadth of effect, and consequently more suggestive of the true character of nature. He wished, however, to be understood as applying these observations to artists only, such productions being considered merely as private *studies* to assist them in their compositions.

During the same year other artists (painters) homologated the sentiments of Sir W. Newton. Among others, Mr. John Leighton discussed the question as to the extent to which absolute accuracy of definition is to be insisted on in photographic pictures. He placed the argument on the footing of an inquiry into the boundaries separating art from nature, the former being defined as something founded upon and bearing some resemblance to the latter. Fine art sought to elevate the imagination by lofty images derived from nature in her most agreeable form. Nature might be, and was, much conventionalised in the noblest and highest art; the abstract was given without the minutiæ. In photography this was reversed, breadth being sacrificed to detail. For purposes of science, for natural history, architecture, or engineering, the utmost detail attainable was advantageous; but the artist would not descend to minutiæ, he desired breadth of effect. He complained that photographs were too literal to compete with works of art; they contained near and distant objects upon the same plane, backgrounds and foregrounds of equal intensity, things known to painters to be incompatible with nature as viewed with the two eyes. Minute detail was the attribute of the sun picture, but not so of the work of art; consequently many photographs might be cut up into several pieces, all beautiful, but no particle could be removed from a work of art without detriment, since it possessed unity.

Still another artist in those early days, Mr. R. W. Buss, propounded sentiments similar to those just given. No slavish imitation of nature, or he was no longer an artist. Some experience in photography, and a life spent in pursuit of art, convinced him, as it would all artists, that good definition would be injurious to the obtaining natural studies of breadth of effect to guide the painter in the conduct of his light and shade in his picture, and so forth. Now, we wonder how much of the denunciation of detail in "works of fine art," so freely indulged in by painters, is owing to the fact that a feeling of jealousy of the camera underlies it. Artists could not afford to spend so much of their time as would be requisite if they attempted even a fourth of the detail in a photograph.

Again, has it never occurred to them that, if they rack the lens in or out to impart breadth to their principal theme or plane in the photograph, by throwing that a little out of focus, they only sharpen some unimportant part by the infallible law of conjugate focus, thus rendering it more intrusive than it would otherwise have been?

It was the appreciation of this difficulty that led Mr. Fox

Talbot to recommend those who desired softness of outline in their prints to insert a sheet of plain paper between the negative and the sensitised paper while printing, and that afterwards led to our devising, in 1863, the first diffusion of focus lens concerning which, when exhibited at a meeting of the Photographic Society of Scotland, it was stated that, in its ordinary condition, it gave great sharpness, but that upon moving a button in a slot, by which the relative positions of the lenses were altered, it gave a picture generally sharp all over, but particularly sharp nowhere. Special attention was directed to the advisability of securing a lowered degree of sharpness in this way, rather than by the common method of putting the subject a little out of focus.

Dr. Emerson's plan of focussing the principal object, and keeping the remainder of the picture in subordination, is precisely what every one worthy the name of a photographer has ever done, be he portraitist or landscapist. But we are doubtful of the possibility of doing this effectively with the lenses he employs, unless the principal object to be focussed stands somewhat far apart from other objects, and, on examining some of his pictures, we find no evidences of the chief object being differentiated in sharpness as compared with other objects at varying distances. But, be this as it may, the Council of the Royal Photographic Society, in awarding him the progress medal, have shown their appreciation of Dr. Emerson's earnest and forcible pleas for the infusion of art principles into photography, even although, as we have shown, this topic largely engrossed the attention of leading photographers so long ago as 1853. His influence has been for good.

OWNERSHIP OF NEGATIVES ONCE MORE.

A SUIT of some interest to the photographic profession was tried in the Brentford County Court within the past fortnight with reference to the vexed question of the ownership in negatives. The case, it is true, is only a minor-Court one, and, of course, does not carry with it the same weight it would have done had it been contested in a Superior Court; but it goes once more to establish the photographer's property in the negatives he takes. The question, however, in this case was not with regard to portrait negatives, but negatives taken for lantern slides from subjects supplied, and it is the first case in connexion with this branch of the business, so far as we remember, in which their ownership has been contested. This case, it may be mentioned, seems to be on "all fours" with one that was submitted to us a few weeks before this was tried, and replied to in the "Answers" column on the 8th inst. The opinion there expressed was confirmed, to the letter, by the Judge's decision.

The case concisely stated was this: The plaintiffs, Messrs. Theobald & Co., were in the practice of sending specially drawn subjects and prints they had obtained permission to copy to the defendants, Messrs. R. & F. Thomas, to copy and make lantern slides of, paying them from 24*s.* to 30*s.* per dozen for the slides. This sum included making the negatives. In this way a large number of negatives had accumulated. Eventually the Messrs. Thomas sold their business, with the negatives, to Mr. Tyler, and Messrs. Theobald had to pay that gentleman 11*l.* 1*s.* 5*d.* to obtain the negatives, which they alleged were already their property. That sum the plaintiffs sued the defendants for, together with 6*l.* damages for the loss of the sale of the slides during a period of two months, and a further sum for trouble, inconvenience, and loss of time in trying to get the negatives back.

After hearing the arguments of counsel and witnesses as to the custom of trade in photography, the Judge found for the defendants on all the issues, with costs. In delivering judgment, his Honour, Judge Bagshawe, said: "He failed to find that there was any custom in plaintiffs' trade different to that in the general photographic trade, where the negatives are held by the photographer, though he could not use them as he chose." During the arguments of the advocates *pro* and *con*, some rather important points were raised that are not unworthy of consideration. One was this—and it is quite within the bounds of possibility that it may have to be faced again on some future occasion—as to the right to dispose of negatives when selling a photographic business. One thing in connexion with this case, it should be mentioned, takes it somewhat out of the usual run of such cases. It is that at various times, even from the first transactions, the plaintiffs had applied for the negatives as being their property. As far back as 1892 the defendants wrote that they would not give them up, but that they would not use them, except at the plaintiffs' directions, and the latter still continued to send them work after that. Here it would seem that, impliedly, the plaintiffs admitted the defendants' right to the negatives, which may have had some weight with the Court.

Referring to the letter just alluded to, the Judge asked if the defendants could transfer the negatives to any one else. The defendants' advocate maintained that they could, and said that "the defendants were in duty bound to prepare the slides, or get a competent person to do so, they assigned their business to a competent person who could have supplied any copies necessary from the negatives." Now, that is precisely what is done in the disposal of every photographic business. But what if the purchaser refused to supply copies? Suppose, in the case now before us, the purchaser of the negatives had been applied to for slides and had refused to supply them at the old rate, or at all, what would have been the result?

It has, in previous cases when portraits were in question, been decided that the negatives are the property of the artist, but that he must not use them for any purpose of his own. That being the case, the question may some day arise as to whether in selling his business the photographer can legally sell the negatives with it, seeing that he is debarred from using them for "any purpose of his own," and selling them might be construed as doing so? When a portrait is taken, there is an implied contract between the artist and the sitter that duplicates can be had at any time at a fixed price—usually mentioned on the receipt, and, sometimes, as well on the mounts. When the negatives are parted with, how can this implied contract be fulfilled? Supposing the purchaser of the negatives declines to supply them at the specified rate, or even supply them at all, in what position would the vendor and the sitter be placed?

We have never heard of the purchaser of a business convenanting with the seller as to any further disposal or use of the negatives.

If a case on the question of disposal of negatives came before a Superior Court, and the defendant was not in a position to incur the necessary expense to properly defend it, clever counsel on the opposite side might so influence the Court or jury as to gain his case. It would then stand as a precedent, and might materially affect the future of the photographic profession.

Photography unfortunately, unlike many other businesses, has no trade society to deal with questions of this kind should they arise. What is required, in the interest of the profession, is an energetic body, like the Photographers' Copyright Union, to watch over its rights and assist in their defence, but we fear it is without the sphere of the Union to do so.

Of course, the case we have supposed is a purely hypothetical one; but, from the point raised by the Judge in the lantern-slide case as to the transference of negatives, it is quite possible that, in these days of litigation, a real one may arise with reference to the disposal of portrait negatives, with the result perhaps, if not vigorously contested, that the interests and rights of the profession might be seriously affected.

HEATING STUDIOS.

THERE have appeared in our pages at sundry times occasional papers on the merits of various modes of heating photographic studios, and we have pleasure in publishing the suggestion lately made to us—as we think it both timely and useful—that those of our readers who have, during the great frost had any experience of a special nature with their hot-water apparatus should send particulars to us, and so enable future studio-builders to reap some valuable knowledge from the experiences detailed. The strength of a chain is its weakest part, and so with hot-water systems; of two apparently equally good arrangements, at a time of trial such as we have experienced for so long, one will not stand the supreme test, while the other passes it unscathed.

It will not be necessary to enter into but a slight description of the two opposite systems of hot-water heating, high and low pressure. In the former there is no boiler, no safety-valve, no reservoir. The water-pipes are of narrow bore, and, being of wrought iron, can be twisted in any shape, and made to fit any sinuosities of the building, and pass through walls with little disfigurement or disarrangement of the premises. When in good order, they need little attention, and not more than a few ounces of water per week to make up for waste.

The low-pressure system is the best known, and consists of the familiar length and congeries of pipes, from four inches in diameter and upwards, that are seen in so many public buildings. They occupy much space, and, when introduced into an existing building, cause naturally much disorder and disarrangement for the time being. When in order, nothing could be pleasanter than the heated atmosphere they produce, while some complain of the high pressure that it burns the air to be "burnt." It is true that the water passing through may be made of such a temperature as to cause the pipes it runs through to char wood. Indeed, the water can be made almost "red hot." There cannot, however, be much risk of fire in this, for we believe the fire insurance companies permit the system without extra charge. Another advantage of this system is the rapidity with which, starting all cold, it is possible to get the heat well through the pipes and heating the studio. We dwell a little more freely on this system, as it is less known than the low pressure.

As a start to what may be a series of experiences, we may give the results of Mr. Watmough Webster's method, he having brought this subject before our readers some time ago. He informs us that up to date his high-pressure hot-water pipes have done good, but they have needed looking after to keep a genial temperature in the studio with the thermometer outside at nothing above zero at times. But for many years past he has made a point of keeping his furnace going all through the night, so that, when the caretaker, cleaner, or others working early, arrive, they can start their work with everything comfortable. This we take to be a very important point, for it is not possible to get a fair day's work day after day from an *employé* half frozen for a good part of his time. Mr. Webster further tells us he has had no freezing, burst, or mishap of any kind, though in the high-pressure system it is most important that the pipes be not allowed to freeze at any part. If they do, and the furnace is lighted, there will certainly be a burst somewhere, possibly a serious one. But in this case forewarned is forearmed, and it is very easy to take the necessary precautionary measures.

We now leave the suggestion in our readers' hands. If any responses are made, it would be well to give full particulars of style of heating, size of pipes, and situation with regard to external temperature agencies.

Photographic Bad Stock.—The new President of the French Republic, M. Felix Faure, was recently photographed in evening dress, set off by the insignia of the Legion of Honour. *Apropos* of this, it may be mentioned, says a contemporary, that M. Casimir-Perier's unexpected retirement has thrown the dealers who had laid in a large stock of his portraits into a state bordering on despair, as they do not now hope to find any sale for their goods. M. Carnot's portrait, however, is still in demand, and even that of M. Jules Grévy meets with occasional buyers.

East Wind and Light.—At the last meeting of the Llandudno Camera Club, a paper on *Exposure* was read, and the old couplet quoted,

> "When the wind is in the east,
> Give double the exposure at least."

Now, is it an established fact that double, or any longer, exposure is necessary when the wind happens to be in the east than when it is in any other quarter? Such an idea used to be prevalent, but is there any real ground for it beyond local conditions? We are quite aware that in the western suburbs of large cities the actinic quality of the light is reduced when an east wind is blowing. On the other hand, in the eastern suburbs a similar reduction is experienced when the wind is from the west; but that is simply due to the wind carrying the smoke and haze of the town with it in whatever direction it may travel. It would be interesting to have some definite data as to whether an east wind has any effect on the chemical quality of the light when local influences do not prevail.

Do Platinotypes Fade?—This is a question that has more than once been discussed. The occasion that gives rise to this note was this. Happening to take refuge from the inclemency of the weather, while awaiting a train, in a waiting-room, on one of the principal railways that adorn their stations and trains with photographs of places of interest served by their lines, on the wall was a large frame of excellent platinotypes by a well-known artist. Two gentlemen, evidently amateur photographers, were discussing the point as to whether platinotypes were liable to fade or not? To sustain the former idea, the prints in question were quoted. The lights of the pictures had, to an extent, undoubtedly lost some of their pristine whiteness, but there was no other alteration. Whether the change was due to the oxidation of a salt of iron left in the prints or to the long-continued action of a strong light on the paper itself, it was impossible to say. However, there was no loss of detail or vigour in the prints, and the slight degradation of the whites was quite different from the offensive, sickly yellow tint assumed by fading albumen and gelatine prints. The change in the prints under notice was similar to that which takes place in en-

gravings, and which so enhances their value in the eyes of artists and connoisseurs.

A New Hypo Eliminator.—More than once of late we have referred to patents in connexion with photography—formic aldehyde for rendering gelatine films insoluble—that have been taken out in this country by Herr E. Schering, of Berlin. The specification of another, by the same, gentleman, has just been published. It is for a new method of eliminating hyposulphite of soda from prints and negatives. The inventor mentions that chloride of lime and *eau de javelle* have frequently been recommended, but with slight success, owing to their extremely inconstant composition and other drawbacks. He says: "Salts of persulphuric acid ($H_2S_2O_8$) are excellently adapted for rendering an excess of hyposulphite harmless by oxidation." After the photograph has been fixed, the plate or paper is to be immersed in a dilute—say, one-per cent.—solution of persulphate of potassium, or of ammonium made slightly alkaline. The patentee adds that washing for hours is avoided, for, "with the persulphate, all hyposulphite of soda is removed in a quarter of an hour." Here is the claim in the patent: "The application of persulphates in photography for removing the hyposulphite salts substantially as described." This eliminator, like others that have from time to time been recommended, will certainly eliminate the hyposulphite, but, as with them, the decomposition products will remain in the film unless afterwards removed. This subject has often been dealt with by us in former times.

Inaccurate Thermometers.—It is many years, we surmise, since the thermometer has been consulted so frequently as it has during the last few weeks. Abnormally low readings have been recorded, particularly by some correspondents in the daily press. So low, indeed, have some of them been as, in some instances, to lead one to doubt the correctness of the instruments with which they were taken, especially when there is a wide discrepancy between other readings taken in the same district. By way of experiment, we have submitted a number of thermometers in our possession to a comparative test. They are from various sources; some have the Centigrade scale and others have the Fahrenheit scale, the majority of them being of the better class—chemical thermometers—and one a standard instrument by a first-class house. When immersed in boiling water, all were in unison. On trying them at the other end of the scale—"freezing," they all agreed, the Centigrade ones registering zero, and the Fahrenheit 32° exactly. But with a reduced temperature, such as we have been experiencing of late, a considerable discrepancy was found amongst them. While the standard instrument registered 16°, one of the others stood at 18°, and another at a little over 13½°, a difference of nearly 5°, and almost as great a variation existed between two with the Centigrade scale. Curiously enough, the inaccuracy was greater in some of the more costly instruments than it happened to be in the cheapest one of the lot, which cost but a shilling. From this experiment it will be well to accept *cum grano salis* some of the extraordinary low temperatures that some correspondents of the daily papers have recorded, unless one knows that the instruments relied upon were really trustworthy.

JOTTINGS.

My congratulations to Mr. A. C. Harmsworth, of the *Answers* series of publications, on having secured a valuable item of photographic intelligence, which, so far, has not been made public in the photographic world. *Forget-me-not*, which is one of Mr. Harmsworth's journals that is devoted to matters of interest to ladies, has discovered a lady photographic inventor, of whom it remarks, "It may truly be said that this lady has benefited society by her happy ingenuity." The fair one's claims to be regarded as a society benefactress are recounted in the next paragrapah.

"Photographers of to-day," says the writer, "have a happy way of toning down defects and improving good points in a picture. It is said the photographer is indebted to a lady—by the way, an enthusiastic amateur—for an ingenious way of treating negatives so that irregularities, wrinkles, and facial defects are taken out in the fixing bath, leaving the features in an improved condition, to the happiness of sitter and taker. Of course, this means improvement in business, for, as it has often been pointed out, many persons, especially men, will take great numbers of a picture that flatters them, no matter if it is not quite such a good likeness as it might be. The exceeding roundness of cheek can be easily diminished, a double chin need never appear in a photograph, while a figure of unreasonable dimensions can be rendered passably elegant, these items being especially distasteful to feminine minds. It may truly be said that this lady has benefited society by her happy ingenuity."

Truly, a marvellous "fixing" bath, that retouches a negative, alters the shape of the face, takes away a double chin, and reduces the dimensions of a figure! Who is the unnamed feminine genius, and why have photographers remained so silent over her wonderful discovery? How true it is that the world knows nothing of its greatest men—and women! On behalf of the photographic profession I shall be glad, my dear Mr. Harmsworth, if you will oblige me with further particulars of this new fixing bath. Whatever else it may be capable of doing, it will be hugely welcome if it will in any degree "improve business."

In our own small world of photography we hear little of the evil of foreign competition, although, of course, the thing itself exists and is felt. Let any one run through a list of the materials used by photographic manufacturers and photographers, and it will surprise him to find in how many instances we are indebted to German, French, and other foreign sources of origin. Evidently inspired by a contemplation of the extent to which British photography is dependent on foreign help, a correspondent sends me a long letter, bewailing the apathy of our native manufacturers in allowing themselves to be beaten by foreign chemical companies, opticians, glass and gelatine makers, &c. I would, however, remind my correspondent, and others similarly moved, that by common consent, English photographic preparations—dry plates, films, sensitive papers, lenses, cameras, and so forth—are equal, if not superior to those made in any other part of the world, so that my favourite principle of compensation steps in, to give us cause for self-congratulation on one point, at any rate. Incidentally my correspondent laments the fact that the print-shop windows are almost wholly filled with German and Austrian photogravures, collotypes, and other photo-typical productions, and plaintively asks, Why should this be so?

The answer I suppose should be, because our Continental competitors are ahead of us in producing good work cheaply and quickly. My own observations tend to convince me that we have much leeway to make up before we can consider ourselves level with American and Continental competitive houses in photo-mechanical work. Doubtless a variety of causes, among which the conditions of English labour prominently figure, are responsible for our backwardness. But I wonder if English employers, as opposed to their employees, are in any way to blame in the matter. I was much struck by some recent remarks, in a contemporary, from the pen of Mr. J. F. Nesbit, an able and thoughtful writer on every-day topics, dealing with the reason why German coloured pictures are more popular than English productions. There seems so strong a probability that what applies to colour-printing applies also to photo-mechanical work, that I give Mr. Nesbit's remarks in full.

"During the late festive season," says Mr. Nesbit, "I was pestered with appeals from societies and bodies of different kinds, and even private individuals, begging me to raise my voice against the iniquitous practice of English firms who get their fancy printing done in Germany. Millions of our Christmas cards, it appears, are printed in Germany, but the question is not exclusively a Christmas one. It is always with us. A great deal of colour printing for this country

is done by the Germans all the year round, and the Protectionist fanatics are never tired of appealing to us not to buy this work, but to patronise the home trade. Well, I was at the trouble, not long ago, of going thoroughly into the rights and wrongs of this question. In other words, I investigated some of that portion of the problem which the interested patriot usually does not see, or which he chooses to keep in the background, and I found this: That the German trade has a much more businesslike method than ours; and that, if, on the whole, English workmen, when put on their metal, are still the best, they are being increasingly handicapped by the faulty English system. The English master is fast becoming, if one may put it so, too good for his business. He has taken it over as a going concern from his father. He has been to Oxford, and in due time he comes to have a look at the dirty old works in which the family fortune has been made. Does he soil his dainty fingers with printer's ink? Not at all. He has no practical knowledge of the business, and does not take the trouble to acquire any. He lives a little way out of town, and drives in three or four days a week to give a look round the counting-house. If anybody comes to discuss the question of a big contract with him, he can't, he does not, know anything about the business. For the practical working of it he keeps a manager who is often a promoted workman, narrow in his views, wedded to old-fashioned ideas, and not at all up to date. Now, frankly, can a combination of this kind be expected to succeed? Is not this typical English employer, whom I have described, a detrimental, a mere deadhead, practically earning nothing? Has not all that he draws out of the business to be added to the price of the article, and does not his foreman's inefficiency necessarily translate itself into inferiority of production? Then look on the German side of the picture. The German employer is still a master-man. He lives in or over, with or near, his business, and takes a pride in it. He is the best man in his shop, and is ever on the watch for improvements. He saves the salary of a manager because he is the manager himself, and is prepared to discuss all the technicalities of the business with any one who approaches him. Apart from the question of the greater number of hours per week which the German workman puts in, is it to be wondered at that German trade in the matter of colour printing should be cutting into the English?"

The allegation, implied above, that the English employer, as a rule, does not take the same personal interest in his business as his German rival, is, I fear, only too near the mark. The moral is well worth laying to heart by photographers. At this moment the largest and most successful businesses in the three kingdoms are those which are conducted under the constant personal superintendence of the principals, who are themselves capable of taking a share of the practical work. On the other hand, I could mention several other businesses, which were once large and flourishing, that are now dwindling to nothing, and are owned by non-technical men, who are incapable of posing or lighting a sitter or doing anything in the production of a photograph except pay wages—and that not always.

That excellent and progressive body, the Hackney Photographic Society, has commenced the issue of a chatty little members' journal. I have one fault to find with it, and that with regard to its title. It is called *Jottings*. Now, good Hackneyites, for years past "Jottings" has been the headline under which, in this JOURNAL, I have constantly made photographic surveys from China to Peru, and, as I know you are all devout and attentive readers of these pages, I think I have a right to complain of your having infringed my title. What's to be done? Shall I commence an action, or will you sign a humble apology, to be published in all the photographic papers, and forfeit 30*l.* to the Photographers' Benevolent Association? I pause for a reply.

The result of the Council election of the Royal Photographic Society was just exactly what all true friends of the Society could have wished, and I hope, therefore, it may be permissible to express one's hearty satisfaction at the action of the members in sticking to those who had served them well and constantly. I also trust that, now the contest is over, the smoke of controversy will rapidly clear away, and that all parties will unite in working for the good of the Society and of photography. It is obvious, from the annual report, that during the next twelve months the Council will have its hands full of important labours, so that unity and concord are essential to their effective fulfilment.

Mr. O'Neill, the Secretary of the National Association of Professional Photographers, in his letter published on February 11 (page 95), gratifies me by the reasonable spirit in which he takes my criticisms of the body he represents. At the same time he must forgive me if I cannot regard his letter as a serious refutation of my charge that the National Association of Professional Photographers has done "nothing in particular." Time, labour, and money have, he says, been spent. With what results? Simply, according to Mr. O'Neill, (1) the Free-portrait Scheme "has been brought before the Council;" (2) a photographers' "Prize Drawing" and "Free-tuition Scheme" has been smashed up. This is little enough, in all conscience, for a "National Association," that has now been in existence several years, to have achieved. I await Mr. O'Neill's promised "further instances" of what the National Association of Professional Photographers has done with great interest, and in the mean while I hope that, in assuming the *rôle* of candid critic, I may not be regarded in any other light than that of a friend of the National Association of Professional Photographers, and of the large profession it aspires to represent.

There is one point in Mr. O'Neill's letter which will bear further reference. He says, of the free-portrait scheme, that the photographic profession thoroughly understood the matter, and assumes that the Association was powerless to protect the public against the free-portrait knaveries. What an admission of impotent *laissez-faire*-ism! I should have thought that, in protecting the public, the Association would be conferring an indirect, if not a direct, benefit on the profession at large. And such protection need not, as Mr. O'Neill supposes, take the form of costly legal proceedings. I will give him two instances where the public is protected at a comparatively cheap rate: (1) The Stock Exchange Committee warn the public against bucket-shop keepers and outside brokers generally. (2) The Society of Authors warn authors against submitting MSS. to advertising publishers. These warnings take the form of advertisements, which cost money, it is true; but has it never occurred to the Council of the National Association of Professional Photographers that, for a very few pounds, a circular letter might be addressed to every newspaper in the kingdom, quoting the result of the notorious Beresford case, and warning the public against similar schemes put forth under other guises? It is the duty of photographers to protect the public in this matter.

"Photo"—horrid abbreviation that it is—finds, I am sorry to notice, an undiminished degree of favour among non-photographic writers. But why "photo," and why not "tele" for telegram," "phono" for phonograph, "chrono" for chronograph, and so on down the list? It is astonishing to observe how widespread is the use of the mutilated term. To me there is something peculiarly indicative of carelessness and ignorance in its employment by second-rate writers, among whom, indeed, the existence of the entire word "photograph" would appear to be unknown; and, while this remains so, the chances of habituating the community to the sight and use of "that dreadful word" "photogram" remain correspondingly remote, of course, which is something to take comfort at, any how.

"Spooks" are mysterious bodies with which Mr. W. T. Stead and other persons of an eerie cast are supposed to be on speaking terms. From all I have read of them, I should conceive a spook to be, in the words of Mr. Mantalini, a "dem'd, moist unpleasant body." But a "spook ballad," notwithstanding the associations suggested by its name, is of a far different and more agreeable nature. There is, in fact, nothing spookish about it; on the contrary, it is a merry, whole

some, jovial thing, calculated to make you smile and put you in a good temper. That is my experience of *The Spook Ballads* (published by Simpkin, Marshall, & Co.), a copy of which the author, Mr. W. Theodore Parkes, having learned of my morose and saturnine disposition, has kindly sent me. Mr. Parkes is clever and polished alike in the expression of humour and pathos. Indescribably funny is his true story of the deluge as told by "Antediluvian Pat O'Toole," and a note of grim tragedy is struck in the tale of "John McKune," the adventures and death of a traitor to the Irish cause. Numerous Cockney ballads and legends, including an interview with "The Devil in Richmond Park," showing his dark majesty to have at least the merits of honesty and candour; and rollicking Irish lays, many of them admirably adapted for recitation, go to make a delightful book, which is tastefully got up, and has the uncommon merit of being well illustrated by Mr. Parkes himself, who is as skilful an artist as he is an author. My only regret is that *The Spook Ballads* did not reach me a month ago; for, during all the bleak and bitter weather we have had, the laughter they provoked would have made me so warm that I should have found it unnecessary to make such costly assaults upon the contents of the domestic coal-cellar as I have been obliged to do.

COSMOS.

THE SCREEN AND ITS EFFECTS.

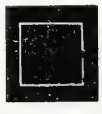
THE paper by Professor Burton has been read by me with much interest, and some experiments I have made may throw some light on this little-understood subject. When first using the Levy screen, I was at once struck by what to me was the curious fact that, while the clear glass spaces in the screen were perfect squares, the dots produced through them were perfect circles when using the screen at such a distance as would best reproduce the gradation of the original, and I immediately commenced a series of experiments which I here detail. In all of them the screen was at a fixed distance from the sensitive plate, the same copy was used, and in each case reduced to the same size. More particularly in half-tone work there is one correct exposure which for the highest class of results must be given, and I should say that, when one constantly varies the form and size of the stop as I did in these experiments, I merely judged the aperture to be of the same area, and consequently the exposures were not all so nearly correct as was desirable. The screen was in such a position that the lines were diagonal with the negative.



1. Using a circular stop, the dots of resulting negative were truly circular.

2. Using a square stop set so, its sides being true with the lines ruled upon the screen, the resulting dots may be described as not truly square, but square with the corners off.

3. Placing the square diaphragm so gave a similar result, but with less sharpness.



4. Using a stop in the form of a cross and placed so, its area, consisting of five equal areas, dots were no longer produced, but the resulting negative was in lines, in fact the same as the screen itself.



5. Turning the same stop into the position indicated, a most surprising result followed, in place of the usual dot a series of little crosses occupied the position of the usual dots, but somewhat lacking in sharpness. This convinced me the dot was really an image of the stop used. However, I carried the matter further.



6. Using a stop in the form of a slot so, I found that this diaphragm used with a cross-lined screen will obliterate one set of lines, and the resulting negative will be divided into single lines only instead of dots running parallel with the slot.





7. By reversing the position of the slot the same result was obtained, but, of course, the lines ran in the reverse direction.



Experiment No. 4 goes to show that the dot of the negative is really only a reproduction of an image of the stop, and experiments 6 and 7 amply confirm this. In looking around for a reason, it occurred to me at the time that the camera, by partitioning one end off with the screen, was converted into a camera within a camera, each clear space on the screen acting as a pinhole to reproduce the image of the diaphragm.

Mr. Burton falls into an error when he says the dots are practically of the same density. This is not correct. In the best negatives obtainable for half-tone work the dots extend over the whole plate, even in the deepest shadows; but, in the more transparent portions of the negative, the dots, which clearly are so weak as to have no printing density, are printed through, and so is produced a solid in the image on the metal plate.

On examining a half-tone negative before intensifying, the contrast is much less marked than when finished, for, while the intensification is very considerable in the high lights, and the dots representing such portions of the copy may by very vigorous intensification be extended until they "bung up," there is extremely little increase in the dots in the shadows, the fact being, such dots are not strong enough to intensify. From the greater liability of the wet plate to this aggregation in the high lights may be attributed the supposed superiority of the wet over the dry for process work.

The apparent thinness of the negatives used in half-tone work is much less apparent than real. A much thinner negative will answer for line work than can be utilised for half-tone, the fact being that the albumen coating used in direct line work, as distinguished from transfer work, being so very much thinner than the sensitiser used for half-tone, the negative for the latter has the greater need for density. But on comparing negatives for the two processes, at first sight this does not appear to be the case. The very large proportion of the density of the negative—say one-third—which has been cut out by the screen is very misleading, and, while the apparent density is not great, it will be found on examination that, at any rate in the high lights, actual opacity exists.

It may here be clearly laid down that there is no such thing as a "black and white" negative for half-tone; careful examination will show that, after all, it is really a matter of vignetting, and the half-tone printer on zinc or copper is well aware of this. If a half-tone negative were truly "black and white," there would be no intermediate stage in printing upon the metal; either the print would be correct, or the spaces he desires clear would be veiled, and so absolutely useless. But the proficient half-tone worker recognises that, with a perfect negative that will give the dots in the high lights the correct size, he may, by over-printing, enlarge these dots to such an extent as to make the print worthless, although portions of the metal will be free from the slightest veil. Examine a negative, more particularly in the high lights and intermediate tones, and it will be found that the dots consist of opaque dots surrounded by a halo of gradually decreasing density, through which, by too-prolonged exposure, printing takes place and over-exposure becomes apparent.

EDWIN C. MIDDLETON.

SIMPLE APPARATUS FOR TESTING THE SPEED OF SHUTTERS.

BEFORE the Ealing Photographic Society, on February 14, 1895, the President (Mr. H. Peal), after pointing out some of the more important qualities required in a good shutter—among others, freedom from vibration (at least until the shutter is closed), quick opening and closing, and a large portion of the exposure to be made at full aperture—showed a simple apparatus he had made to test the length of exposures.

This consisted of a wood frame, on the front of which was fixed a black cardboard dial, about fourteen inches in diameter, divided near its outer edge into 100 equal spaces by thin white lines, each fifth line being made rather longer, to facilitate counting.

Through this was carried a short steel knitting needle (in smooth bearings to give little friction), one end projecting through the centre of the dial, on which was carried a wood hand, on the long arm of which was fixed a small silvered bead about a quarter of an inch in diameter, at a distance just short of the white division lines. The hand is rotated at a definite speed of two revolutions a second, and a photograph is taken in sunlight, the exposure being made by the shutter to be tested. When the plate is developed, the dial shows with a line caused by the reflected light from the bead. The number of divisions corresponding with the line shows the number of two-hundredths of a second the exposure lasted; say the number is ten, then the exposure was ten two-hundredths, or one-twentieth of a second.

The hand is rotated by a suitable length of cotton, wound about three times round the axle, the ends passing over a drum to prevent entanglement, and a weight of about four ounces is attached to one end, and a smaller one, say one ounce, to the other.

To enable the rate of rotation to be regulated and maintained at the required speed, a large cork is fixed on the axle, and two wires are thrust into this radially, and opposite to each other on these are skewered pieces of cardboard, which offer more or less resistance to the air as their faces are turned parallel or at right angles to the axle.

The apparatus is supported in use on a camera stand, and a stick, cut to a length corresponding to the distance the weight falls during 100 revolutions, is suspended close to, but clear of, the weights, the bottom end touching the ground.

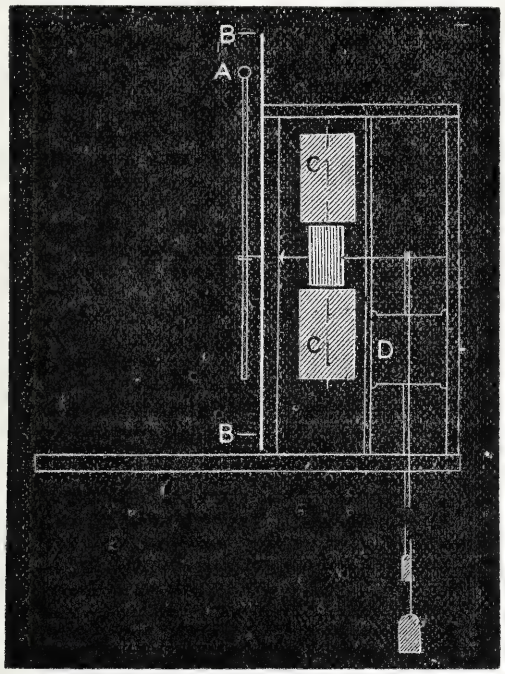
The heavy weight is then gently lifted up above the top of the stick

(the cotton will slip over the axle), and, when liberated, it will commence to descend and rotate the hand.

The time is observed that the bottom of the weight takes to descend from the level of the top of the stick until it touches the ground, and the fans are adjusted until this is fifty seconds.

It is necessary that the fans and hand be balanced to prevent irregularity of the bead's motion.

By this apparatus a fair estimate of the efficiency of a shutter can be formed, especially if the exposure is made in a weak light or the lens stopped down to give an under-exposed negative. The graduation at the



Section: A, bead; B, dial C, fans D, revolving drum.

commencement and end of the line is, with some kinds of shutter, very marked.

Magnesium ribbon can also be used as the illuminant, in which case it is desirable to use six or eight pieces, twisted together, and burn close to the dial, and shielded from the lens.

The electric arc light is satisfactory with continuous currents, but alternating currents give a series of short lines or elongated dots.

For accurate photographic working, it is very desirable to know the value of an exposure by a shutter, particularly at its different speeds. One shutter, whose fastest speed was marked as one-fifth of its slowest, was found to vary only from one-thirtieth for fastest speed to one-seventeenth for the slowest, being less than one-half instead of one-fifth, as stated.

PHOTOGRAPHIC SOCIETY OF IRELAND'S EXHIBITION.

The Annual Exhibition of the above Society was, on Monday, the 12th inst., inaugurated by a *conversazione*, at which a large number of members and their friends were present. Mr. Ruthven, the Hon. Secretary, announced that he had received letters of regret for non-attendance from His Excellency the Lord-Lieutenant, Field-Marshal Lord Wolseley, and the Lord Mayor. The programme of the evening consisted of music, a lantern display of the prize slides, and those sent in for competition, as well as the numerous exhibits which adorned the walls, and which were drodduced by several of the energetic workers of the Society. The musical items comprised pianoforte solos by Miss Ruthven, who displayed marked talent as a pianist; violin solo by Miss Delaney; songs by Mrs. Dr. Werner and Mr. Elridge. A no less interesting feature in the programme was Mr. W. F. Cooper's representation of the wizard's art; he proved himself a master in the domain of legerdemain, and greatly pleased the audience with some very clever card tricks, a new trick with tumbler and handkerchief, and a host of others.

In going over the exhibits, we were particularly struck with the pictures sent in by A. M. Geddis, to whom the Judges justly awarded the silver medal in Class I. Nos. 7 and 8, entitled respectively *Cottage Island* and *Holy Well* (Lough Gill), call for special attention. *Donolly Castle*, Oban, N.B., by J. A. C. Ruthven, is a fine specimen of pictorial photography, and we cannot pass over No. 11, by R. M. Inglis, without a word of praise; it is entitled *At Grindelwald, the Wetterhorn in background.* This is a picture strong in composition. No. 24, *Mill on the Voss, Norway*, by J. A. C. Ruthven, is good; the four pictures marked No. 25 in Class II., *Dolbadarn Castle, Llanberis, Mill on the Liffey* (2), *On the Shanganagh*, by H. Goodwillie, are especially fine, being well put together, they are good compositions, and are bold and vigorous prints we feel inclined to think this frame should have secured the medal rather than the one to which it was awarded. The bronze medal, in our opinion, has been misplaced. R. M. Inglis's frame, No. 27, showing work far and away ahead of that shown in No. 26, to which it was bestowed. *Slieve Lish* No. 31, and *Sligo River* No. 32, both by A. M. Geddis, form two pretty little bits, they are from quarter-plates. Frame 37 contains four views by H. Goodwillie, which secure the silver medal, and one very good technically, but do not please us so well from the artistic standpoint as No. 25 by the same exhibitor. Frame No. 35, A. E. Gordon, shows some excellent views taken at Killarney. Class III., J. Simpson, secures the silver medal for frame 45, views of yachts, the bronze medal going to H. Goodwillie. In this class we have four small pictures by J. M. Keogh, two of which are little scraps of poetry, we are sorry these have been passed over by the Judges. The battle of Ballsbridge, No. 54, *Advance 1st Bat. Grenadier Guards, Skirmishers, 2nd Rifl' Brigade, Medical Department at Work, Naval Brigade from "Melampus,'* by H. Goodwillie, deserve special mention.

Classes V. and VI. have few exhibitors, the best work being sent in by J. M. Keogh, H. Goodwillie, J. Simpson, and A. M. Geddis.

Class IV. (Figure Studies) is also a small one, No. 79, *A Home Ruler* (H. Goodwillie), being the only subject worthy of mention.

In the Champion Class, which was open to all pictures which have taken awards, the gold medal was withheld, there not being the requisite number of competitors. The silver medal was awarded to J. A. C. Ruthven for his beautiful picture of *Kilchurn Castle*, Loch Awe, N.B. Other good exhibits in this class were R. N. Inglis's *A Rainy Day in Glen Rosa*, Arran, N.B., *Sunshine and Shower* (J. M. Keogh), and *When Day Declining* (J. C. Mummery).

The lantern slides sent in for competition were not so numerous as last year, nor do we think, with the exception of half a dozen or so of the sets, were they at all equal to the last competition. A. M. Geddis was awarded the silver medal, J. Simpson the bronze. Mr. Geddis' slides were remarkably good, and showed good artistic feeling and very superior technique. Mr. Simpson's slides were technically very good, but did not please us quite as much as the studies by J. A. C. Ruthven. F. A. Orr's *Morning Lesson* is a fine piece of work, and illustrates a reverend gentleman in costume reading a lesson from the chancel. The effect of the lighting is particularly good; the white hair, face, and surplice stand out in great relief against the dark background; the photograph seems, as it were, taken during service, and does not betray any sign of movement on the part of the clergyman. Other slides by this gentleman are also good, notably a set illustrative of golfing.

We herewith append a list of awards:—

Class I. (Landscape over 8 × 6).—Silver medal, A. M. Geddis; bronze medal (withheld).

Class II. (Landscape under 8 × 6).—Silver medal, H. Goodwillie; bronze medal, Thos. Taylor.

Class III. (Hand Camera).—Silver medal, J. Simpson; bronze medal, H. Goodwiliie.

Class IV. (Figure Studies).—Silver medal (withheld); bronze medal, H. Goodwillie.

Class V. (Marine).—Silver medal, J. M. Keogh; bronze medal, H. Goodwillie.

Class VI. (Historical and Archæological).—Silver medal, T. G. Barlow; bronze medal, A. M. Geddis.

Class VII. (Lantern Slide, Landscape).—Silver medal, A. M. Geddis; bronze medal, J. Simpson.

Class VIII. (Lantern Slide, Figure).—Silver medal (withheld); bronze medal, F. H. Orr.

Class X. (Champion).—Silver medal, J. A. C. Ruthven; bronze medal (withheld).

Amongst the loan collection, *Tymon Castle*, by V. E. Smyth, is remarkably fine, and was medalled at a previous exhibition of the Society. *Taken in Munich* is another example of the artist's work, which shows the greatest care from beginning to end. Good work is also shown by G. Mansfield, F. H. Eason, Miss White, T. Armstrong, and others.

Among the professional exhibits on loan were photographs from the studios of Messrs. Lafayette, Robinson & Son, and Werner & Son, whilst Messrs. Curtis Bros., Suffolk-street, Dublin, and Messrs. Robinson displayed photographic requisites of every description.

Every evening during the week, exhibitions of lantern slides and lectures were delivered by various members, the public being admitted for the nominal figure of 6*d*.

SIMPLE SUBJECTS AND THEIR TREATMENT.

[Brixton and Clapham Camera Club.]

"How fond," said Mr. W. Thomas at the Brixton and Clapham Camera Club recently, "we are of bewailing either the state of the weather or a lack of opportunity for picture work, and giving one or both of these reasons as accounting for not having done anything of late. Yet surely both are equally bad, for the weather must indeed be strange that will not allow some class of subjects being attempted. A wet, grey day—just see what may be done under this generally-grumbled-at condition of weather You know a corner with a clump of trees and a roadway ankle-

deep in mud and slop. Approach this, and, instead of grumbling, attack it with dry plate and camera, making a strong feature of those much-maligned ruts full of muddy water. Here is a simple subject out of which much may be made. Go, look at, and consider well a print of Leader's *February Fill Dyke*. Then carefully examine the roads on your way to or from business or shopping, the first really wet day that comes, and, as you do so, there shall be unfolded some of the many beauties contained in commonplace subjects, even when nature dons her least pleasing garb.

Equally mistaken is the notion that one cannot attempt pictures for lack of opportunity to get away into the country or to the seaside. What real need is there to do so? Certainly may as fine pictures be made in this big overgrown London of ours as anywhere in the wide world. Mr. Thomas urged his hearers to try to make pictures from the simple material lying close to hand rather than to attempt those subjects which attracted the eye by their grandeur. To point his remarks he instanced three subjects which any one might find without trouble—a roadway, a cow, and a pony—and endeavoured to show how by proper treatment results of a pleasing character might be obtained, necessary qualities being that they should be agreeable in composition, broad in effect, and tastefully finished. Speaking of composition, he indicated on the blackboard the principal lines of a picture and how they should be disposed; and, again, how greatly the effect depended upon the *massing* of the light and shade. He showed prints illustrating the three subjects instanced above, and pointed out how, in the case of the first—a roadway—although the lines ran somewhat unpleasantly, he had, by choosing a particular point of view, by throwing the whole slightly out of sharp focus, and by taking an opportunity when the lighting favoured the scheme, obtained a result not to be despised as a picture. The print illustrating the second subject was a gem, although in this case it was requisite that a *portrait* of the animal should be secured. He laid stress on the necessity to study technique sufficiently to be able to produce any class of negative at will, and suggested that in printing it would be well to confine attention, until somewhat certain of results, to a process giving simply black and white, so that one should not be carried away by the fascination of colour, and overlook from that cause imperfections in composition and tonality. "Mounting and framing," he continued, "depend upon circumstances and tastes, but let the materials be good and quiet.

"For small sizes Whatman paper is excellent, and always in good taste; and a narrow black oak frame and gold slip finish a picture which, if itself good, will be pleasant to you and all who see it. In conclusion, learn technique thoroughly, choose your subjects for their *simple* beauty, and be broad in your treatment of them. When you have learned to walk, strike out for yourselves on your own lines, throwing to the winds all preconceived ideas taught by mechanical photographers. Forget as far as possible that you are using a machine, and express yourselves as nearly as the implements and process will allow—as you would if using brush, pencil, or etching needle, never forgetting that the beauty of nature is in its mystery, and which is not best rendered by glaring lights or brilliant definition."

EXHIBITION AT LEICESTER.

The fourth Public Exhibition of Photographs, under the auspices of the Leicester Photographic Society, was held here on Wednesday and Thursday of last week at the Co-operative Hall—public, in the sense that the collection was open to inspection by all and sundry; private, inasmuch as the medals were offered for competition to members only.

The Exhibition is, nevertheless, a very good one. Some five hundred pictures are shown, and although a score or so of these might very well have been left out, the majority are of decidedly good quality.

It may be said at once that any show which includes work by the late Mr. R. Keene and Rejlander; work by Mr. Scotton, Shapur N. Bhedwar, Ed. Brightman, G. Bankart, J. W. Wade, and Martin J. Harding, to say nothing of veterans as Mr. J. Porritt and Mr. Pickering, towers of strength to the Leicester contingent, must necessarily be well worth viewing.

Medals were offered in numbers sufficient, one would think, to bring up the bulk of the members to competition mark; however this may be, those awarded are annexed by Messrs. G. Bankart, H. Pickering, J. Porritt, H. L. Cowdell, T. W. Gamble, and W. Murray.

Mr. Bankart's work, in various shades of carbon, is, as usual, very fine; the best of a good two dozen views being *Rouen, Old House in Cloister, Caudebec; St. Ouen, West Portals;* and *Rouen, Rue Damiette.* Mr. T. W. Gamble shows good work in small sizes; on a larger scale some of them would take a lot of beating. Mr. J. Porritt, the genial ex-President, is, of course, well to the fore with a good assortment of views, of which two interiors of Salisbury Cathedral and another of Tintern Abbey are striking examples.

Other good work is shown by Messrs. Pickering, Dunmore, Miles, Hogg, and Toone. Mr. Squire, the President, contributes thirteen frames, the views of Warwick and Sandringham being of exceptional merit.

There are one or two amusing errors in an otherwise well-ordered catalogue. Mr. Cooke shows a photograph of a *Plague!* and Messrs. Butcher advertise an exceptionally handy and portable camera, which measures $7 \times 4\frac{1}{4} \times 4\frac{1}{2}$ feet

It is certain that, if the Leicester Society would only venture on a larger and open exhibition, their efforts would be crowned with success. They have a pretty good idea of what a function of this kind should be, and make exceptionally good provision for visitors. To put it on no higher ground, what a rush there would be from all parts of the world for the unique and rare Leicester medals!

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

Report of the Committee for the Year 1894.

We have pleasure in reporting one of the best years of work that the Photographers' Benevolent Association has ever done in the relief of distress and suffering. At the same time, we deeply regret that, in spite of the efforts of the Committee and a few good friends outside, and in spite of the continued and generous support of the photographic press, the interest taken in the Association by the photographers to whom it appeals is smaller than ever before. We append the amounts received and expended during the past four years.

	Receipts.				Grants and Loans.			
	£	s.	d.		£	s.	d.	
1891	96	10	0	.....	68	11	6	
1892	149	6	3	.....	28	16	6	
1893	117	13	0	.....	143	17	4	
1894	51	5	10	.....	141	19	0	

This state of affairs has naturally caused us great uneasiness, especially at a time shortly before the end of the year, when the funds were almost entirely exhausted, and when we felt obliged to refuse assistance in two or three cases which we should otherwise have helped.

We believe that some of those who would otherwise have contributed to the funds have been deterred by the appearance in our balance-sheets of the large sum (now amounting to 279*l.* 15*s.* 10*d.*) invested in Consols. Unfortunately this sum (really the property of "A" members of the original Association) is one with which we cannot deal in any way except for the purpose of—

"Grantin g annuities, from the interest accruing therefrom, to duly qualified subscribers or life governors. No subscriber is eligible to become a candidate for an annuity unless he has subscribed to the funds of the Association for three consecutive years."

We can deal with neither principal nor interest of this sum (which is really a trust fund) in any other way.

Meanwhile, as the later half of the winter is sure to bring many urgent calls, we appeal to all members for their continued interest and support.

The past year, with its continued depression, has told so heavily on photographers generally, that the item "Repayment of Loan" is unusually small.

Our especial thanks are due to the Royal Photographic Society for the use of their rooms, and also for the usual benefit night at their Annual Exhibition, the receipts from which are not completely to hand at the present time. To the photographic press we are indebted for continuous support.

We have carefully considered all the various suggestions put forward for the improvement of the status of the Association, and at the present time have a suggestion before us which we trust may lead to the recognition and proper support of the Society by those who have hitherto neglected it. For the Committee,

Alexander Mackie, *Chairman.*
H. Snowden Ward, *Hon. Secretary.*

Balance-sheet for the Year ending December 31, 1894.

Receipts.	£	s.	d.	£	s.	d.
Bank balance from 1893	162	12	4			
Balance in Post Office Savings Banks, 1893	22	3	11			
Pension Fund, $2\frac{3}{4}$ per cent. Consols	250	0	0			
Interest on investments	7	11	11			
				442	8	2
The Ealing Photographic Society	3	19	0			
The Hackney ,, ,, ... £1 18 0						
,, ,, ,, ... 1 15 0						
	3	13	0			
Messrs. Marion & Co.	3	3	0			
The *Amateur Photographer*	3	0	0			
Messrs. H. Dixon & Son	2	12	6			
George Mason, Esq.	2	2	0			
The Eastman Photographic Company	2	2	0			
Sir H. Trueman Wood	2	2	0			
T. C. Hepworth, Esq. (*Photographic News*)	2	2	0			
The *Practical Photographer*	1	13	3			
The British Journal of Photography	1	1	0			
Mrs. William Bedford	1	1	0			
Messrs. Mawson & Swan	1	1	0			
Messrs. Ross & Co.	1	1	0			
J. Stuart, Esq.	1	1	0			

John Spiller, Esq...	1	1	0			
Messrs. W. Watson & Sons	1	1	0			
F. M. Sutcliffe, Esq.	1	1	0			
H. M. Hastings, Esq.	1	1	0			
Albion Albumenising Company	1	1	0			
A. W. Lee, Esq.	1	0	0			
Messrs. Noble & Co.	0	15	0			
The Blackfriars Company	0	12	6			
H. M. Cooper, Esq.	0	10	6			
T. Sebastian Davis, Esq.	0	10	0			
The Cromwell Photographic Club	0	10	0			
Charles Faulkner, Esq.	0	10	0			
Arthur Reston, Esq.	0	10	0			
Donations and subscriptions under 10s.	4	17	1			
				46	13	10
The Pall Mall Exhibition (Lantern Night)	4	7	0			
Repayment of loan	0	5	0			
				4	12	
				£493	14	

Expenditure.	£	*s.*	*d.*	£	*s.*	*d.*
Grants and loans				141	19	
Printing and stationery	3	13	3			
Postage and petty disbursements	2	16	6			
Balance due to Secretary, 1893	6	18	11			
				13	8	8
Pension Fund in 2¾ per cent. Consols	250	0	0			
Interest on Pension Fund in Post Office Savings Bank	29	15	10			
Balance at bank	43	4	7			
				323	0	5
Cash in hands of Secretary				15	5	11
				£493	14	0

Audited, compared with vouchers, and found correct, February 4, 1895. THOMAS BEDDING. J. GUARDIA.

Our Editorial Table.

HAROLD BAKER'S RETOUCHING MEDIUM.

G. Houghton & Son, 89, High Holborn.

MESSRS. HOUGHTON are introducing this new retouching medium, the advantages claimed for which are that it reduces the time occupied in finishing negatives by one-third to half of that necessary with the old mediums; that it will not go "fat" and greasy, and can be used to the last drop in the bottle; and that work can be commenced within a few minutes of the time it is spread on the negative, and it is unaffected by varnishing. We have tried the medium and find it answer its purpose excellently.

THE "BARNET" PLATINO-MATT BROMIDE PAPER.

Elliott & Son, Barnet, N.

WE have before now recounted our favourable experiences of the Barnet Matt Bromide paper, and the pleasing frontispiece to the current ALMANAC is a capital example of the results it yields. Further samples of the paper have recently been submitted to us together with specimen prints. Pictures obtained on the Barnet bromide paper are of a rich delicate black, with perfect gradation from the shadows to the lighter tones, and the total effect is highly pleasing and artistic. The developer recommended is metol. Having regard to current taste, the Barnet Matt Bromide paper should become one of the most popular printing surfaces of the day.

THE STRAND MAGAZINE.

IN the February number Mr. William G. Fitzgerald finishes his article entitled *Some Curiosities of Modern Photography*. He opens with what was, and still is in America, a real curiosity, "The Headless mule." This animal, being old and worthless, formed the subject of an experiment. A package of dynamite was fastened upon his head and was exploded by electricity, a camera shutter being liberated by the same current. As a result the body of the animal is photographed after the head has been blown off, but before the legs have collapsed, hence the headless body is seen still standing upon its four legs. A magazine rifle bullet is shown in transit; another in the act of penetrating a glass plate; composite photographs; views taken from a military balloon; prehistoric footprints in the rocks; submarine explosions; telescopic stellar photographs; micro and spirit photographs; horses in rapid motion, and other "curiosities," all go to make up an interesting and readable article. The Portraits of Celebrities at different times of their lives, which form a special series in the *Strand*, embrace Canon Duckworth, four portraits; Mr. Haddon Chambers, four portraits; Mrs. Arthur Stannard ("John Strange Winter"), five portraits; Mr. Joseph Hatton, four portraits; the Duke of Newcastle, five portraits; and the late Lord Randolph Churchill, four portraits. The stories include one suggestive of Atlantis—"An Ocean Graveyard," and a somewhat thrilling one *apropos* of Nihilistic methods, from the Diary of a Doctor.

A HANDBOOK OF ILLUSTRATION.

By A. HORSLEY HINTON. London: Dawbarn & Ward, Ltd.

THE endeavour of the Author, we learn from the preface, is to meet the prevailing ignorance of the nature and application of Photographic Reproduction Processes, by the preparation of a simple practical Handbook of Illustration Methods. It is a most useful book at the present time, when phototypic illustration processes are being so extensively employed, and the Author undoubtedly shows an intimate practical acquaintance with these, and with the means for preparing untouched photographs so as to possess pictorial merit without the sacrifice of literal truth in the finishing reproduction, in many cases showing the untouched and the improved picture side by side. The book throughout bristles with points of technical and artistic interest, and is most copiously illustrated—there being no fewer than seventy-five pictures—by various processes. It is just the book to place in the hands of any artist, young or old, who is in training for, or desirous of becoming acquainted with, the requirements of drawing for illustration processes, being simply and well written. The publishers, too, deserve a word of commendation for the excellent manner in which the book is got up. Price 3*s.* net.

PHOTOGRAPHIC LENSES: HOW TO CHOOSE AND HOW TO USE.

By JOHN A. HODGES. Bradford: Percy Lund & Co.

THIS book is addressed to the beginners in photography, in the hope that, by a reference to its pages, they may solve some of the doubts and difficulties not dealt with in detail in ordinary instruction books. The author starts with a few words on light, and, after explaining some of its properties and its composition, shows in what manner it is refracted by means of a beam of sunlight, transmitted through a prism, and then speaks of various forms of lenses in use at the present time. The new lenses made of Jena glass also come in for a brief description, and lastly that so recently introduced by Mr. Dennis Taylor, of the performance of which he speaks in high terms. The book contains many hints to beginners relative to focussing and the use and care of lenses in general. Its weakest point is in some of its diagrams; indeed, its author has just cause to be dissatisfied with his engraver, who has made some diagrams that optical truth is very far from bearing out; such, for instance, as fig. 5, which shows a degree of curvature of field quite unattainable with any lens but Sutton's panoramic one, whereas a symmetrical compound is drawn. So, with figs. 7 and 8, in which curvilinear distortion is shown as being greater close to the centre of the field than at the margin. In like manner, figs. 15 and 16 show the back elements of portrait lenses such as they never were and never will be constructed. We direct attention to these in order to their rectification by the engraver or draughtsman. But, for all that, there is much in the book useful for a beginner. Price, 1*s.* 6*d.*

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, February 26, at 50, Great Russell-street, at eight p.m. *The Correct Rendering of Colours in Black and White*, by J. W. Gifford.

ON Thursday, February 28, at 8.30, at the Imperial Institute, Mr. Andrew Pringle will give an illustrated lecture on *The Reproduction by Photography*

of the Microscopic Image. The chair will be taken by Captain W. de W. Abney, C.B., D.C.L., F.R.S.

AFFILIATION OF PHOTOGRAPHIC SOCIETIES. — The Committee have arranged for two lectures to be delivered at the Cordwainers' Hall, Cannon-street, E.C. (by kind permission of the Company of Cordwainers), by Mr. Thomas Bolas, F.I.C., F.C.S., upon *The Physics and Chemistry of Development.* The lectures, which will be illustrated throughout by experiments, will take place on Mondays, March 11 and 18, at eight p.m. The chair will be taken by Sir H. Trueman Wood, M.A.

"AFTER THE FROST IS OVER."—Late on Friday night the police found Mr. Vevers' photographic warehouse in Market-street, Leeds, flooded with water, and, on breaking open the premises, discovered that a large pipe in the enlarging room at the top of the building had burst, through the effects of the frost. A tremendous volume of water was escaping, which they stopped as quickly as possible, but not before considerable damage was done. Three rooms and basement were flooded, and a great portion of the ceiling in the retail shop fell and smashed a large showcase and its contents underneath. Much of the valuable stock of lanterns, slides, and photographic goods were destroyed, and the damage sustained cannot fall far short of 100*l.*

PHOTOGRAPHIC CLUB.—On Wednesday evening, February 13, the members of the Club gave their Annual Lantern and Musical Entertainment (Ladies' Night) under the direction of Mr. F. A. Bridge. A pleasant and successful evening was passed, the following being the programme:—Duet, "Whitehall March," violin, Miss Maud Lander; pianoforte, Mrs. Lander. Slides by Mr. P. Foucard, Mr. A. G. Tagliaferro, and Mr. G. W. Tottem. Selection (flute), "The Bohemian Girl," Mr. Montague Kino. Slides by Mr. C. Beck and Mr. W. K. Burton. Song, "Oh! hear the wild wind blow," Mr. Charles Wallis. Song, "Who's that calling" (banjo accompaniment), Miss Maud Lander. Slides by Mr. W. D. Welford and Mr. F. P. Cembrano, jun. Solo pianoforte, "Two Waltzes," Miss Muriel Gaze. Song, "The Deathless Army," Mr. F. A. Bridge. *Norway* (slides), by Mr. A. Bridgman. *The Honeymoon* (slides), by "Unknown." Solo pianoforte, "Pastourelle," Miss Louisa Pyne. *Tower Bridge,* &c. (slides), by Mr. J. W. Barlow. *Italy,* &c. (slides), by Mr. J. A. Sinclair. Ballad, "When other lips" (*Bohemian Girl*), Mr. M. C. Gaze. Solo (flute), "Mignon," Mr. Montague Kino. Slides by Mr. E. A. Newell and Mr. L. Medland. Song, "Angus Macdonald," Miss Maud Lander. Riverside ditty, "The Three Anglers," Mr. F. A. Bridge. *Switzerland* (slides), by Mr. Frank Haes. Slides by Mr. H. M. Hastings. Humorous song, "The Coster's Courtship," Mr. Charles Wallis. *Ireland* (slides), by Mr. F. A. Bridge. *Flowers* (slides), by Mr. J. A. Williams.

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.—The annual meeting of this organization was held at the Imperial Hotel, Leeds, on February 14. The following members were present:—Messrs. H. J. Whitlock, Birmingham; J. Gunston, Bradford: J. F. Beyes, Derby; T. Illingworth, Halifax; Birtles, Warrington; M. Boak, Driffield; E. Greaves, Halifax; Harold Baker, Birmingham; D. MacIver, Leeds; W. Barry, Hull; J. E. Eddison, Barnsley; Warwick Brookes, Manchester; Bromwich, Bridgenorth; F. Whaley, Doncaster; J. Langton, Sheffield; W. Davey, Harrogate; R. Broadhead, Leeds; W. P. Glaisby, York. The chair was occupied by Mr. H. J. Whitlock. A general discussion took place as to the lines upon which the Association should be continued, and the general feeling was that its policy should be slightly modified and the social element strengthened. By-laws 8 and 9 were rescinded entirely, and No. 10 was altered to read as follows:—The annual meeting shall be held on November 9 in London, and a summer meeting should also take place in June. Matlock was selected, and the date fixed for Tuesday, June 11. The election of officers then followed. Mr. W. Barry was unanimously elected President, and he then took the chair. A vote of thanks was accorded to Mr. T. Fall, the retiring President. The Vice-Presidents were Messrs. T. Fall, H. J. Whitlock, A. Lafosse, Slingsby, and J. Crosby; Hon. Treasurer, Mr. Warwick Brookes; Hon. Secretary. Mr. Bromwich; Secretary, Mr. D. J. O'Neill; Committee, Messrs. Harold Baker, Birtles, Bryne, Chancellor, Eddison, Fergus, Forrest, Gill, Gregson, Higginson, Keene, MacIver, Martyn, Mendelsohn, Moffat, Van der Weyde, Whaley, Yates, Langton, Davey, Illingworth, and Boak. After the meeting the members joined in the annual dinner. Several remained over night in Leeds, and were conducted round the town by Messrs. Edison, MacIver, and Broadhead, who did everything in their power to make the visit to Leeds a pleasant one.

THE Eastbourne Photographic Society's Exhibition will be held at the Pavilion, Devonshire Park, April 30 to May 4, 1895. Medals are offered for competition in the following classes, the first seven of which are open to all photographers (professional or amateur):—Open Classes. 1. Champion Class (for pictures which have previously received awards). One gold and one silver medal, the former offered by His Grace the Duke of Devonshire. 2. Landscape and Marine. Gold, silver, and bronze medals. Gold medal offered by Carew Davies Gilbert, Esq. 3. Portraiture or Figure Study. (In this Class the work may be that of a firm, and need not be that of the exhibitor alone.) One silver and one bronze medal, the former offered by W. E. Morrison, Esq. 4. Hand-camera Pictures (set of not less than four). (No combination printing allowed in this Class.) One silver and one bronze medal, the former offered by J. E. A. Gwynne, Esq. 5. Lantern Slides (set of six). One silver and one bronze medal, the former offered by Mr. Alderman Keay. 6. For the best Exhibit showing the Capabilities of Photography as applied to the Decorative Arts. In this Class may be included such applications of photography as transparencies for windows and screens, enamel work, the decoration of furniture, &c. One silver and one bronze medal, the former offered by Geo. Bolton, Esq. 7. For the best Example of Photography showing its application to Scientific Work (astronomy, microscopy, spectroscopy, meteorology, &c.). Special medal offered by Sir David Salomons. For members of the Eastbourne Photographic Society only. *A.* Landscape and Marine (enlargements permitted). One silver and one bronze medal, the former offered by Geo. A. Wallis, Esq. *B.* Hand-camera Prints (set of not less than four). (No combination printing allowed in this Class.) One silver and one bronze medal, the former offered by the Rev. H. G. Jameson. *C.* Lantern Slides (set of six). One silver and one bronze medal, the former offered by G. J. Wightman, Esq., Mayor of Lewes. A special gold medal is offered by His Worship the Mayor of Eastbourne (J. A. Skinner, Esq.), for the best exhibit in Members' Classes. The names of the Judges will be duly announced in the photographic press. All communications to be addressed to the Hon. Secretary and Treasurer, J. J. Hollway, 11, Hyde-gardens, Eastbourne.

MONKLANDS PHOTOGRAPHIC SOCIETY'S EXHIBITION.—To most readers of the JOURNAL the place or district known as Monklands is, doubtless, a *terra incognita;* all the same, it exists, and lies within a dozen miles or so of Glasgow, in the Middle Ward of Lanarkshire. It really consists of the two parishes of New and Old Monklands, in which there are, respectively, as their chief towns, Airdrie and Coatbridge, which are in the very centre of the "Black Country" of Scotland. Both of them have for many years played a most prominent part in the rise and development of the coal and iron industries. It was in this same district that David Mushet discovered the famous blackband ironstone, the smelting of which has so largely contributed to make the big fortunes of many Scotch ironmasters, and it was there that James Beaumont Neilson practically worked out his great invention of the hot-blast system of smelting ironstone. But the amateur workers with the photographic camera in Airdrie and Coatbridge (which are only some two or three miles apart) bethought them to do something else besides getting coal and ironstone, making pig iron and small cable iron, and engaging in other industrial pursuits for the making of their "daily bread;" in short, they resolved on going in for the formation of the Society whose name heads this notice. That was about a couple of years ago, and it has now become so thoroughly organized as a working body that it lately sought a convenient opportunity for showing the people of the Monklands what its members have been doing both in their individual and their corporate capacity. Airdrie enjoys the peculiar distinction of being the first municipality in Scotland to adopt the Free Libraries Act, which was carried through Parliament by the late Mr. William Ewart—a Scotsman, by the way, but an English M.P. That opportunity occurred when it was lately determined to form a museum in connexion with the library, now housed in a very superior suite of rooms. The Photographic Society is accommodated within the new buildings, and the use of one of the halls has been granted for an exhibition of the members' work. The formal opening of the museum took place last Friday, and that function was immediately followed by the opening of the Photographic Exhibition. As it is held within the premises of the *Free* Library, no charge is made for admission, as in the case of the museum; but the members are said to be abundantly satisfied with the arrangement, as they have not been put to much expense in their bit of novel enterprise—their first appearance before the public. The appearance which the members have made by their various collections of pictures is highly creditable to them. As might be expected, local scenery is largely turned to account by the Monklands photographers. Even in the Scottish "Black Country" there are many picturesque spots, some of which have been visited by the Society in their excursions; but, in many instances, the Airdrie and Coatbridge camera men have gone much further afield than the Middle Ward of Lanarkshire. Some of them have gone into the Callander and Trossachs country, and have produced pictures which are worthy of much commendation. In this connexion special reference may be made to the views contributed to the Exhibition by Mr. W. D. Gray, Secretary of the Society. Mr. Skeil, one of his colleagues, has likewise been in that classic country with his camera. The last-named gentleman has also got some excellent pictures from the kingdom of Fife. A number of exhibitors have done good work in that county, Dunfermline Abbey and Palace (in ruins) bulking prominently in the collection. Mr. Robertson, Vice-President of the Society, has several capital bits of work, but not the least telling of them is a view of Machribanish Bay, with a magnificent wave just burst into a mass of spray. Mr. R. C. Platt, who is perhaps the only professional member of the Society, is strong in telling bits of local street views, but he also takes his camera to such famous places as Roslin Chapel, Melrose Abbey, and other spots in the country of Scott. Some of his best work was done on the occasion of the Edinburgh Convention. In portraiture this gentleman has an enlargement on opal, which is much admired by visitors to the Exhibition. He also shows a bromide print, an enlargement, which he names *A Happy Couple.* There are numerous lantern slides by Messrs. Gray, Wood, Motherwell, Robertson, Eadie, Hassack, Birrell, Lewis, and Skeil, all of whom have contributed to make a very successful Exhibition for a Society which is only two years old.

IMPERIAL INSTITUTE.—The first lecture in connexion with the forthcoming Special Exhibition of Photography at the Imperial Institute was delivered on Monday, February 18, by Captain W. de W. Abney, C.B., D.C.L., F.R.S. President of the Camera Club. In dealing with his subject—*The Eye and Photography*—the lecturer, at the outset, declared his intention of endeavouring to show how the eye saw things, and to compare the methods by which both the eye and the camera, with its sensitive plate, might be said to "see" objects. In doing this, he traced the probable evolution of the eye, as exemplified by the organs of sight possessed by the Nautilus, Gasteropod, Cephalopod, and the human race. In the case of the three former classes, the eye was not sensitive to colour, as no colour apparatus was attached to the retina of these eyes; all seen, therefore, would appear as black and white, and even the human eye, under certain circumstances, could only see black and white, although a brilliant colour was before it. A section of the human eye showed externally the cornea, then the lens, and behind that the retina, with its peculiar structure, its rods and cones—the colour-perceiving apparatus, by means of which one colour can be distinguished from another. The eye was, after all, not very different from an ordinary camera. In the camera there were three essential parts—a lens, a diaphragm to "stop down" that lens, and a sensitive material on which to receive the photographic image and to impress it. In the eye we had the same things—the iris, the lens, and the retina, which was designed to receive the images formed by the lens. What were, then, the essential differences between the retina and the photographic plate? They were, that the sensitive material with which our eyes were lined was per-

petually being changed and renewed, so that it could not retain a permanent impression of the images seen, whilst the photographic plate was capable of doing so, and that the eye could perceive colour to which the photographic plate was not sensitive. In other words, there was a lack of colour in the one, and in the other the sensitive material, which received the impression of light, was constantly undergoing change. By light he meant the waves in the ether which reached us from any source. Light was really an effect of radiation by wave motion, and the word "light" was used to express that radiation and its effects upon the eye. Light could only be analysed effectually by the aid of the spectrum, that band of coloured light into which white light was decomposed. There was other light which was invisible, some of which lay below the red, and other above the violet. We could ascertain for ourselves that there were rays which existed beyond the visible violet, but which did not affect the eye. (By a series of beautiful experiments embracing the phenomenon of fluorescence and the action of the low heat rays on the thermopyle, the lecturer then showed that there were rays far beyond the violet, and rays below the red, which could be photographed.) By accurate measurements the relative brightness to the eye of the different parts of the spectrum had been measured and compared with the brightness as seen by the photographic plate. In the case of the eye, the yellow part of the spectrum was found to be the brightest, but to the photographic plate it was the violet part. The lecturer then drew attention to a diagram of the two curves of luminosity illustrating this point, where the highest part of the curve represented the maximum brightness. To obtain by a photograph the effect produced in the eye when a coloured object is looked at, some means must be found to make these curves exactly alike. In other words, to produce by a photograph, in monochrome, the effect on the eye of the various colours of a coloured object, it was the brightness or luminosity of each colour that must be exactly reproduced. (This was illustrated by a simple experiment.) The lecturer then showed on the screen the difference between ordinary light seen by the eye and seen by the photographic plate, where bromide of silver was the sensitive agent. If nature were illuminated by the kind of light shown on the screen, then a photograph would faithfully reproduce the effect seen by the eye. Absorption of light was universally accompanied by a chemical or mechanical action. A modified specimen of silver bromide was exhibited, by means of which it was possible to photograph for a distance below the spectrum four and a half times the length of he entire visible spectrum below the red; and also photographs taken with this salt in which the heat rays below the red were clearly indicated. The lecturer then took photographs with this salt, of the low heat rays, by the use of eosine and cyanine dyes, and exhibited a diagram of the effect produced. Captain Abney then demonstrated the result of the careful study and discoveries which he had made by a series of photographs, showing, side by side, an engraving and a photograph of well-known coloured pictures, thus illustrating that the difficulty arising from the difference between the eye and the photographic plate had been so far overcome that it was hard to discriminate between the engraving and the photograph. Photographs taken by moonlight approximated more nearly to the truth owing to the peculiar character of the spectrum of moonlight, in which green greatly predominated. A fine series of moonlight and starlight photographs was exhibited and criticised, and prints made by starlight were also shown. The difference in intensity between sunlight and starlight was as one to ninety or one hundred millions. The eye was sensitive to starlight, but in this it was far outstripped by the photographic plate. He thought that photography had not yet exhausted all the resources of civilisation. There were a good many more walks open to it in the future, and starlight development was the latest one. He hoped that as time progressed, the photographic plate would become a more active agent, and a greater friend to scientific workers, and that they would take to it and make it an increasingly valuable recorder of their work. On the motion of the CHAIRMAN (Mr. Francis Cobb) a cordial vote of thanks was accorded Captain Abney for his interesting and instructive lecture.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 2986.—"Improvements in the Manufacture of Photographic Plates and Films." C. F. OAKLEY.—*Dated February*, 1895.

No. 3002.—"Improvements in Electric Arc Lamps for Photographic Purposes." G. DEVEY.—*Dated February*, 1895.

No. 3197.—"Hand Camera." C. HOWSE.—*Dated February*, 1895.

No. 3277.—"Improvements in Flashlight Apparatus for Photographic Purposes." H. E. RATHBUN and F. BEBBY.—*Dated February*, 1895.

No. 3341.—"An Improvement in Photographic Cameras." F. STUBBS.—*Dated February*, 1895.

No. 3356.—"Improvements in the Manufacture of Mineral and Enamel Colours for use in the Production of Ceramic and other Photographs." G. J. ATKINS.—*Dated February*, 1895.

PATENTS COMPLETED.

IMPROVEMENTS IN APPARATUS FOR DRYING PHOTOGRAPHIC PLATES, FILMS, AND PAPERS, AND SUCHLIKE ARTICLES.

No. 3605. FREDERICK ILES, 100, Highgate-street, Birmingham.—*Dated December* 22, 1894.

MY invention consists of a hub or pulley, capable of being rotated at a high speed by any convenient means, attached to which are radial arms, preferably of a flat form, so as to produce air currents when revolved; the said radial arms carry movable pins or projections extending above the edge or surface of the said radial arms, and so formed that they can be adjusted or locked thereon by means of screws, cotters, wedges or other suitable arrangement, at any or certain positions required; and, to obtain greater security, the radial arms may be notched, slotted, or recessed, so that portions of the movable pins can engage therein. In place of the radial arms, a plate or disc attached to the aforesaid hub or pulley may be used, having perforations or slots into which the retaining or movable pins can be fixed.

The movable pins may be, in part, covered with rubber, to prevent vibration and injury to the articles required to be dried.

When other than flat radial arms are employed, fans or wings may be attached to the radial arms or to the movable pins for the purpose of creating air currents; and, where plates or discs are used, portions of these may be bent at angles for a similar purpose.

The articles to be dried are placed within the area bounded by the movable pins, which retain them in position during the necessary rotation, the superfluous moisture being driven off by centrifugal force, and is collected by a pan or vessel within which the above-described apparatus revolves, and a further portion of the moisture is dissipated by the aerial currents produced during rotation.

In cases where a specific size of article is required to be dried, the retaining pins or portions of the apparatus may be permanently fixed to the radial arms, plate, or disc.

IMPROVEMENTS IN THE PREPARATION, PACKING, AND STORING OF PHOTOGRAPHIC CHEMICAL COMPOUNDS.

No. 4689. JAMES RANDOLPH COURTENAY GALE, 3, Egmont-road, Sutton, Surrey, and JAMES WILLIAM THOMAS CADETT, Ashtead, Surrey.—*January* 12, 1895.

HITHERTO great difficulty and inconvenience have been experienced in preparing, packing, and storing certain chemical compounds and substances used for the production and development of photographic images, on account of the limited solubility of such chemical compounds and substances. Among such chemical compounds and substances may be mentioned quinol, potassium metabisulphite, and others.

Our present invention relates to an improved process and method of preparing, packing, and storing such chemical compounds or substances, and has for its object to obviate the disadvantages above referred to by concentrating and storing the same, so as to preserve the essential qualities thereof unimpaired, and at the same time to admit of their being packed in a highly convenient form, whereby they are rendered extremely portable, and are ready for immediate use.

Such invention consists in taking the requisite chemical substances and mixing them together in suitable proportions with a sufficient quantity of water, glycerine, gum, gelatine, or other suitable medium or media (such quantity being determined by the particular substances under treatment), and stirring or beating the mixture thus produced until it assumes the consistency of paste or cream, in which form it can be readily packed in either small or large quantities in suitable receptacles of any convenient size and shape, so as to preserve the same in a condition ready for immediate use, as, by adding an adequate proportion of such paste or cream to a suitable quantity of water or other suitable solvent the required solution is obtained.

In preparing such paste or cream, the component ingredients or substances may be treated either with or without the aid of heat, as may be found most desirable, the employment of such auxiliary aid being determined by the nature of the particular substances under treatment.

We wish it to be clearly understood that we make no claim to the particular substances or ingredients employed, the features of novelty of our invention consisting in the particular method of blending or mixing such substances together so as to produce a paste or cream in the manner hereinbefore described, and in packing and storing the same in suitable receptacles, so as to preserve the essential qualities of the mixture, and thus render it ready for immediate use. In order that our said invention may be better understood, we subjoin the following formula as an illustration thereof. Take two parts of quinol, two parts of potassium metabisulphite, and one part of potassium bromide, and grind the same together in a suitable vessel; then add sufficient water thereto, taking care to continue to grind or stir the same until a paste or cream is formed. Heat may be used as an aid to the mixing or solution of the substances, the stirring being continued until the mixture assumes a pasty or creamy consistency while cooling.

Should there be any tendency to precipitation, glycerine, gum, or the like may be added in sufficient quantity to counteract such tendency.

Claim:—Taking any chemical compounds or substances suitable for developing the photographic image, and mixing them together either with or without the aid of heat with a sufficient quantity of water, glycerine, gum, gelatine, or other suitable medium or media (such quantity being determined by the particular substances under treatment), and then stirring and beating the mixture thus produced until it assumes the consistency of a paste or cream, and packing and storing such paste or cream in suitable receptacles of any convenient size and shape, so as to preserve the same in a condition ready for immediate use, all substantially as hereinbefore described.

IMPROVEMENTS IN CHANGING BOXES OR BACKS FOR PHOTOGRAPHIC CAMERAS.

No. 4866. ANDREW RIDDELL, 134A, St. Vincent-street, and JOHN SINCLAIR, 150, Buchanan-street, both in the City of Glasgow.—*January* 12, 1895.

THIS invention relates to changing boxes or backs for carrying the sensitive plates or films for exposure in photographic cameras, and it has for its objects mainly to dispense with the use of sheaths for the plates or films whilst providing protection against access of light to the spare plates during the exposure of any single plate, and generally to facilitate the operations of changing and recording the changes of plates.

The improved apparatus comprises a light-tight box adapted to be fitted to the back of a photographic camera, into which box the plates or films are deposited so as to rest vertically on edge on the bottom of the box when in use, and either in contact with each other or separated merely by strips of paper gummed at the edges of the plates or films, in order to protect their sensitive-

surfaces from actual rubbing contact with the surfaces of the adjoining plates or films. The plates or films are inserted from the back of the box, which is preferably hinged or otherwise fitted to open up for access to the interior, and a sliding plate or shutter is fitted near the front of the box, the plates or films being pressed into contact with each other and towards the sliding shutter by a spring fitted at or on the back of the box. The top or one end of the box is either open or has two slits formed in it, one in proximity to the back, through which the plate to be exposed is withdrawn, and the other at the front, through which the plate is inserted for exposure in front of the sliding shutter, the open or slitted end of the box being encased or covered by a flexible light-tight bag or hood, so as to protect the plate whilst being removed from the rear to the front of the box for exposure.

One plate at a time is lifted from the back of the box either by hand or by means of a sliding bar or rod fitted in the hinged back and having a catch or projection at its lower end which engages the bottom edge of the plate and draws up the latter through the rear slit into the flexible bag, the forward pressure on the plates being relieved during this operation by pressure of the hand on a knob or lever, which acts to retract the spring bearing on the plates. The plate thus lifted out is grasped through the flexible bag or hood, and inserted through the front slit into position in front of the sliding shutter, where it may be exposed in uncovering the lens of the camera. During each exposure the spare plates are protected from light by the sliding shutter, which then remains closed; but, after exposure and re-covering the lens, the sliding shutter is raised by means of a suitable knob or catch piece within the flexible bag, whereupon the exposed plate drops or is pushed back into contact with the spare plates behind the shutter, which is thereafter closed to protect the plates during the succeeding exposure. During exposure, the plate placed in front of the shutter is, or may be, kept in register by means of light springs fitted on the front of the shutter, and on the withdrawal of the shutter it may either be dropped by gravity into the box, or, as is preferred, it is pressed back by the projecting ends of light wire or other springs, which are normally pressed forward by the shutter, to lie in front of the edges of the plate being exposed.

In one side of the box is fitted an indicator disc or dial, bearing on its face a series of number, one of which at a time is visible through an orifice. This indicator is operated so as to advance by one the number exposed through the orifice by the action of withdrawing and replacing the sliding shutter, the edge of the shutter, or a projection on it, engaging one of a series of teeth or notches on the indicator, and turning it to the requisite extent at each exposure, so as to indicate the number of plates exposed.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

February.	Name of Society.	Subject.
25	Camera Club	
25	Lantern Society	
25	Liverpool Park	Demonstration on *Lantern-slide Manipulation.* G. W. Gaskell.
25	North Middlesex	
25	Putney	
25	Richmond	*Stereoscopic Photography.* T. Bedding.
26	Birmingham Photo. Society	
26	Bournemouth	*Platinotype Printing.* W. H. Smith, of the Platinotype Company.
26	Brixton and Clapham	*Enlarging.* John A. Hodges.
26	Hackney	*Studios and Dark Rooms.* G. D. Sargeant.
26	Lancaster	
26	Leith	
26	Newcastle-on-Tyne & N. Counties	*Printing Processes.* Frederick Park and John Watson.
26	Paisley	
26	Rochester	
26	Royal Photographic Society	*The Correct Rendering of Colours in Black and White.* J. W. Gifford.
26	Warrington	
27	Bath	
27	Burnley	
27	Croydon Camera Club	Demonstration of *Photography with the Incandescent Gaslight.* D. Waller.
27	Halifax Camera Club	*Handy Way of Printing Skies.* B. Bingley.
27	Leytonstone	
27	Midland	*Uranium Toning.* Mr. Hall-Edwards. L.R.C.P.
27	Photographic Club	*Denmark.* H. Wilmer.
27	Southport	Exhibition of "Rejlander" Slides.
27	Stockport	
28	Ashton-under-Lyne	Demonstration: *Coloured Lantern-slide Making.*
28	Camera Club	
28	Dublin Y.M.C.A. Camera Club	*Portraiture.* Mr. Lawrence.
28	Ealing	Demonstration: *Flashlight.*
28	Glossop Dale	
28	Halifax Photo. Club	
28	Hull	
28	Ireland	*Development: Developers, Treatment, Results.* A. Werner and R. M. Inglis.
28	Leigh	*Warm-toned Lantern Slides.* W. R. Moore.
28	Liverpool Amateur	*Rambles in Upper Rhineland.* J. Earp.
28	London and Provincial	Discussion on W. K. Burton's paper. *The Collinear Lens.*
28	Oldham	
28	West London	*Composition.* Mr. Collyer.
28	Woolwich Photo. Society	*Architectural Photography.* W. H. Dawson.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 14,—Mr. E. W. Parfitt in the chair.

Mr. Horace Wilmer was elected a member.

Mr. COUTTS exhibited and demonstrated a flash lamp, in which aluminium powder was burnt. In use, the blast was obtained by air being forced through a saturator charged with benzoline. Several experiments were made to show that very little smoke resulted from the combustion of the aluminium.

Mr. W. E. DEBENHAM mentioned that several years ago he had taken photographs by means of aluminium burnt in oxygen.

Mr. A. HADDON drew attention to the fact that Mr. Thomas Bolas was an early advocate of aluminium.

It was decided to continue the Association's subscription to the affiliation of photographic societies.

Mr. W. D. WELFORD proposed that an auction sale of members' old apparatus be held on an early occasion. Mr. EVERITT seconded, and the proposition was carried, the evening of April 25 being chosen for the date. A committee, consisting of Mr. Everitt, Mr. Welford, and Mr. Bedding was appointed to draw up the necessary rules.

The following questions from the box were read: "What is the best way to illuminate a square of glass to photograph it?" and "What is the best way to photograph snow crystals?"

Several suggestions were made, but none that appeared to be satisfactory.

The evening concluded with a display of lantern slides, the work of Mr. Everitt and Mr. T. E. Freshwater.

Brixton and Clapham Camera Club.—February 12.—One new member elected and two candidates proposed, making thirteen during the few weeks the Club has been in its new quarters. Mr. W. THOMAS read a paper on *Simple Subjects and their Treatment* [see page 119], and Messrs. Archer, Dockree, Eckersley, Soldby, Price, and others, contributed to the discussion that followed.

Croydon Camera Club.—February 13.—The meeting-room was decorated by an imposing display of photographs by various master hands, of different phases of beauty in snow and sea scenery, amongst those whose works were shown being Mrs. E. Main, represented by her celebrated Engadine studies; Paul Lange, unexcelled for pictures of frost-diamonded weeds and twigs; W. P. Marsh, the strong man for breaking waves; Zybach, of Niagara fame; Vittorio Sella, the capturer of more snowclad mountain-tops than even the late Mr. Donkin; and, lastly, West & Son, whose pictures of yachts on the wing, and of grim death-dealing battleships, are alike world-admired. In addition to these, the members exhibited many interesting prints restricted to the above classes of subjects, amongst which were some striking works by Messrs. Corden, A. and G. W. Jenkins, and Noaks. The report, read by the PRESIDENT (Mr. Hector Maclean, F.G.S.), indicated that the Club has had a busy year. Twenty-six important evening meetings were held, at which the attendances varied from a minimum of fifteen up to two hundred and fifty, the larger number being on public nights. Twenty field excursions were held, amongst other places visited being Gatton Park and mansion, Broomhill, Cambridge, and the Deepdene. The year's income was considerably in excess of the expenditure, and the small balance against the Club shown by the accounts at the previous annual meeting was thereby converted into a credit one. The report, accounts, and balance-sheet having been adopted, the following were selected as officers for the year 1895-6:—*President:* Mr. Hector Maclean, F.G.S., F.R.P.S.—*Vice-Presidents:* The Hon. Sidney Herbert, M.P., the Mayor of Croydon (Mr. Alderman F. T. Edridge), and Mr. James Glaisher, F.R.S.—*Council:* Messrs. Burn, Corden, Frost, Noaks, J. Smith, Wreford, G. W. Jenkins, Hirst, S. Wratten, and J. Packham, F.R.H.S.—*Hon. Secretary:* Mr. H. E. Holland, 69, Lansdowne-road, Croydon.—*Hon. Assistant Secretary:* Mr. F. L. Bown, 39, Selhurst New-road. Following the elections, a discussion on snow photography was held. The date of the annual dinner was fixed for Wednesday, March 6, the stewards being Messrs. D. Waller, Noaks, Fenton Frost, J. Smith, and H. E. Holland. There were present a large gathering of the members.

Richmond Camera Club.—Notwithstanding a biting east wind a large and brilliant gathering was present at the *conversazione* of the above Club, held at the Theatre Royal, Richmond, on the 14th inst. The theatre itself not having been sufficiently large on the previous occasion, the adjoining ball-room was also thrown open to the guests. The great attraction of the evening, to judge by the remarks of the non-photographic assembly, was, as usual, the display of lantern slides. The lantern, which was ably manipulated by Mr. R. R. Beard, was placed on the balcony of the theatre, while the screen was on the stage, a distance of some seventy feet. The quality of the slides was distinctly superior to the display at the previous *conversazione*, good work being shown by Messrs. Ardaseer, Davis, Cembrano, Gibson, Child, St. John Hunt, Hunter, Purcell Williams, Ramsay, Harris, and G. Bickerton. Five small screens contained pictures the work of members, which also showed distinct improvement. The musical part of the programme, which was under the direction of Messrs. Alabaster, Neville, and Ennis, was most successful, the singing of Madame Marie Athol and Miss Jessie Dimsdale being especially noteworthy, while the musical sketches by Mr. Cecil Barnard were most humorous and clever.

Liverpool Amateur Photographic Association.—Mr. PAUL LANGE delivered his new lecture entitled, *A Trip to the Austrian Tyrol.* With his accustomed dry, pleasant humour, Mr. Lange described a trip in the early summer of 1894 through Nuremberg and Muspruck to the mountain region on the borders of Northern Italy known as the "Dolomites." Thence he travelled to the Italian lakes. The lecture was illustrated by about 130 lantern pictures from the lecturer's photographs, and the series may be pronounced one of the most brilliant successes.

Liverpool Park Photographic Association.—A successful meeting of this young Society was held at 186, Park-road, on the 11th inst., when Mr. WARWICK, the Hon. Treasurer, gave a demonstration upon bromide enlarging,

using Eastman's paper and the ferrous-oxalate developer recommended by that firm. Mrs. Agnes E. Cassell, of 29, Newstead-road, was elected Hon. Secretary, to whom all communications respecting applications for membership should be addressed.

Plymouth Photographic Society.—February 15.—Mr. E. H. MICKLEWARD demonstrated the facility with which, by the cold process, platinotype prints could be produced by development with the aid of a brush and a sheet of glass. The iron developer and glycerine caused the print to come up so steadily that many members who had refrained from starting the platinotype process from its seeming difficulties were agreeably surprised.

Glasgow and West of Scotland Amateur Photographic Association.—Annual Report.—At the close of the eleventh year of the Association, the Council have again to report satisfactory progress. While the very rapid increase of membership noticed during the previous two years was not to be expected, there has been a gain of sixteen members this year. There have been elected fifty-four, while the loss through death, resignation, or removal on account of arrears, has been thirty-eight. Removal for the last-named cause has been rigorously put in force during the past two years, and there is every reason to believe that the 304 names now on the roll are those of *bonâ-fide* members. The financial position of the Association is satisfactory. During the year there has been considerable expenditure for special purposes, such as increasing the dark-room accommodation, providing an additional set of lockers, also purchase and binding of books for the library. Notwithstanding this, there is a balance in bank of 61*l.* 4*s.* 9*d.*, and property in the rooms valued at 163*l.* 14*s.* 6*d.* There are no outstanding liabilities. Informal meetings have been held every Monday evening on which no regular meeting occurred, and the Council desire to impress upon new members the advantages to be gained by making the acquaintance of their fellow-members on these evenings. On the Queen's birthday an outdoor meeting was held at Lochwinnoch, which was more than usually successful, twenty-three members being present. The Council, having noticed that several pictures secured on this occasion were on the walls at the Exhibition, suggest that these meetings should be more frequently held next year, and that there should be a special class at the Exhibition for pictures taken at the excursions. A Lecturette Competition was held in March, the conditions being twenty to thirty lantern slides, with lecture not to exceed thirty minutes in delivery. There were four entries. The silver medal was awarded to Mr. A. Lindsay Miller and the bronze medal to Mr. R. H. Elder. The Annual Exhibition was held at Christmas. There were 428 pictures exhibited by fifty members.

Kilmarnock and Ayrshire Photographic Society.—The usual monthly meeting of this Society was held in the Hall of the Young Men's Christian Association, High-street, Ayr, on Saturday last. There was a large attendance of members from various parts of the county. Mr. J. Mack Wilson (the President of the Society) presided. Mr. GEORGE DAVIDSON, Glendoon, Ayr, gave a demonstration on *Enlarging by the Aid of Hume's Cantilever Enlarging Apparatus*. Mr. Davidson showed several enlargements that he had done, which were much admired, proving that he is an amateur photographer of no mean ability. Mr. WILLIAM Hess, photographic artist, Ayr and Cumnock, gave a demonstration of the platinotype process. The prints he developed turned out exceedingly good, and elicited the warm approval of the audience. At the close there was an exhibition of lantern slides made by members, as well as the *Photography* prize slides for the year 1892. Mr. James Thomson, the Cross, Kilmarnock, and Lieutenant McKellar Irvine were admitted members of the Society. On the motion of Mr. Millar, Commercial Bank, Kilmarnock, a hearty vote of thanks was accorded to Messrs. Davidson and Hess, and a similar one, on the motion of Mr. Gudgeon, Netherby, Ayr, was given to Mr. Ferguson for officiating at the lantern. The President intimated that, at the next meeting, to be held in Ayr on Saturday, March 16, Messrs. Smith and Lee would show how to make blocks from photographs for printing on newspapers.

FORTHCOMING EXHIBITION.

1895.		
March 25–30	*Brixton and Clapham Camera Club. 11, Corrance-road, Brixton, S.W.	F. W. Levett

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

DECADENTS AND THE SALON.

To the EDITOR.

"Why, thou damnable box of envy, thou,
What meanest thou to curse thus?"—SHAKESPEARE.

SIR,—Does it come within the prohibited degrees of moral copyright to make an unjustifiable use of a man's style? I ask, because in your last number an anonymous correspondent, whose charming and gentlemanly communication some experts, no doubt, would say is "signed all over," appears to me to be treating us to a curious plagiarism of style rather than an original exercitation. Clever, doubtless, but it has not the true ring, and it is difficult to rightly estimate in a sane person the depth of envy, hatred, and malice that prompted such a screed. When we compare the sledge-hammer work of the obvious original, whose lively writing I have always enjoyed, and the forcible-feeble imitation in which that style is burlesqued, we are reminded of the old Timon and the new:

"We knew him, out of Shakespeare's art,
And those fine curses which he spoke;
The old Timon with his noble heart
That, strongly loathing, greatly broke."

But of the new imitation we may say:

"And, what with spites and what with fears,
You cannot let a body be;
It's always ringing in your ears,
'They call this man as good as *me*."

The intimation that the writer is a psychological student, that his study of mental phenomena suggests to him that members of the *Linked Ring* are mentally deficient, are *crétines* and neuropaths, is a prettily played touch, but not sufficiently deceptive. The grand original would never descend so low.

There are some expressions in the article one would not willingly let die, because they will probably form a record for years to come. These *Crétines* are accused of many dreadful things—not only of love of detail, but also of fuzziness; "The frightful sneakish sin of plagiarism!" (Oh, Αρς, and you are also guilty of the same at this moment!) morbid personal vanity; and he even finds fault with our clothes, and complains that our coats are of velvet, and our hats large—although we are *cretinés!* He says that they "always band together" (we own up here), and that "their common enemy is a man of genius." Now, if we could find our common enemy, we should secure that *rara avis* we have been looking for, and would elect him a member of the *Linked Ring* right away, and give him, moreover, as many letters after his name as genius—can pay for, always supposing he turned out a clubbable fellow—I mean man; there are no "fellows" in the *Ring*.

When our furious friend so carefully defines a man of genius, is he taking a fancy portrait of himself as he appears in his own mind's eye? He says the man of genius "stands alone," is "never found in a clique," is "sneered at and belittled." He should feel too elevated to notice these little matters, and, if they should go so far as even to give him a medal, he should take it kindly; it may only be their fun, and the offence may never occur again.

Other signs and tokens by which you may know members of the *Linked Ring* are kindly pointed out. They are dishonest; not sincere; they are mad; not a genius amongst them; are as vain as peacocks; appear excessively original; portraits of most of them have appeared in photographic publications (there is a lamentable touch of the green-eyed monster here); are imitators and belittlers of the man of genius; (which he appears to have more on the brain than in it). *Their physiognomy marks them out according to diagnostic signs* given by the psychologist; ("think of that, Master Brook," they ought to feel this); they are dirty and unmanly, and are a miserable little band of creatures that ought not to be called men.

I should say that after all it is not a bad, yet not an excusable parody, if I did not respect the great original too much to do him so much dishonour.

Now, I think anybody would be justified in calling some of this fustian nothing more nor less than vulgar abuse, but the *Linked Ring* is far too successful and generous an institution to allow one of its members to be unkind to one of its best advertisers, and we are short of healthy abuse just now. From the pinnacle of success the members can afford to make allowances for considerable irritation in unsuccessful genius, and weaklings in temper and artistic skill. They can allow this Greek anonymity to call them all the scurrilous names which must have cost him much study to collect, and in which he emulates his brother Greek, Thersites—perchance he is the "vulgar, waspish, railer" himself, as we find him in Homer:—

"——All sate, and audience gave;
Thersites only would speak all. A most disorded store
Of words, he foolishly poured out of, which his mind held more
Than he could manage."

And, by Galen! Thersites was a physiologist, and a naturalist too. See Shakespeare's *Troilus and Cressida*, act v. sc. 1.

I remember in the youth of our Club thanking our apparently unkindest vituperators for the prominence they gave us, and they are now among our kindest friends from the other point of view. It is a bit too late for your amiable and physiological, but disappointed, man of genius to do any mischief, and, if that is his object, he is wasting his vocabulary, his science, and his Greek. We are none of us above taking a possibly malicious pleasure in reading these little exercises in nautical language, although they may be aimed at ourselves, and the writer should have the pleasure of knowing that he is doing no harm. We have heard something of the sort before, but more skilfully done, and have made much unmedalled, but not unrewarded, progress since Rip van Wrinkle began his sleep.

H. P. ROBINSON.

To the EDITOR.

SIR,—I have read my BRITISH JOURNAL OF PHOTOGRAPHY for many years, but never read in it so singular a production as that headed "Decadents and the Salon."

Is it intended to be understood as written, or are we all to interpret it for ourselves? This is what I make of it: It is the work of a brain softened by the concentrated jealousy of a regiment of Othellos, or it is a jocular and not very successful attempt to reproduce the vigorous style of a now almost forgotten photographer, who renounced the sins and vanities of this wicked photographic world as Peter the Great to become Peter the Hermit, much to the disappointment of those who could have better missed a wiser man. I am not a member of the "Linked Ring" which your correspondent so shamefully attacks, but, as one of the very many photographers who are grateful to that progressive body for the recent great advance of the art, I protest against even a lunatic being allowed to call them *crétines*, decadents, and a miserable little band of creatures who cannot be called men.

It is a mystery to others, besides myself, what the "Ring" has done to call forth such a blast from Billingsgate. I hear that admission to the "Linked Ring" is almost as difficult as to the Royal Academy. Has the writer applied for admission, shown his specimens, and been referred back for a little more experience?—I am, yours, &c., H. J. M.

February 18, 1895.

To the EDITOR.

SIR,—Under this title your contributor "Αρς," last week, refers to the deeds in the press of a certain clique. It is possible he has been led to do so by the same thing that causes me to write this, namely, by the receipt of a circular said to be issued by Messrs. Robinson and Hinton of Guildford, in which is quoted an editorial testimony from the *Artist*, the photographic department of which is avowedly edited by Mr. Hinton himself.

This circular, if it were genuine, might deserve your contributor's strictures; but as it is possibly spurious, and meant to bring abuse and ridicule upon Mr. Horsley Hinton's head, I hasten to bring it, through your columns, under his notice, in order that he may have an opportunity, in the same place, of publicly denying his connexion either with the paper in question or with the circular.

No one who knows Mr. Hinton can believe him to be capable of describing himself as "possessing an artistic reputation which should ensure success" in a periodical conducted by himself, and then issue a circular quoting such a testimonial.—I am, yours, &c.,

Barking, February 15, 1895. PROFESSIONAL.

PHOTOGRAPHY IN SWITZERLAND.

To the EDITOR.

SIR,—I see from your latest issue that one of your correspondents asks for information in respect to photography in Switzerland, especially from high altitudes. He quotes an instance of some one having advised the use of slow plates, *f*-32 and the minimum of exposure. Now, may I ask who are going to confine themselves to the use of a shutter (which I presume would be of the focal plane kind) that will work up to such a minimum speed, when by the use of an isochromatic plate or film of medium rapidity and a small stop which will require seconds of exposure it gives the result (one of many), a copy of which I have sent for your inspection? On reference to my exposure register, I find that the negative from which I made the slide of the châlet in the foreground and the glacier and snow-capped mountains in the background, was taken on the 8th of August last year at 4.15 p.m. on an Edwards's isochromatic plate (without screen) of medium rapidity, *f*-32 and *three seconds of exposure*, Dallmeyer single landscape lenses being used, the negative being taken stereoscopically, the developer used being a well-restrained but concentrated one of pyro-ammonia and of normal strength to finish with, as per Edwards's formulæ for normal and redevelopers.

The second one (slide sent) was taken at 5.15 p.m., with *f*-45 and five seconds' exposure, the subject being in the shade; restrained and normal developers as above, same kind of plate being used. The examples sent are very rough and hardly do the negatives justice, the one (collodio-bromide) having been made on the lines of those slides that are exposed, developed, fixed, bound, and are being projected upon the screen within a few minutes.

By the way, *re* your correspondent wanting collodio-bromide negatives, I beg to state that Mr. Brooks has already refused to make them for me, owing to pressure of business. He will suppy the emulsion, however, as he has done me.—I am, yours, &c., J. F. HAMMOND.

February 16, 1895.

N.B.—My experience is that late afternoon and towards evening, is he best time for taking photographs of snow subjects in Switzerland.

To the EDITOR.

SIR I should like to point out to "E. W. C." two difficulties I met in Switzerland. Firstly, a lens of the usual focal length makes the distant mountains too small on the plate; the remedy is obvious. Secondly, the bold contrast between a blue sky and a snow-covered peak is almost wholly lost in the negative.

I tried orthochromatic plates and a yellow screen, but with little success, possibly because the screen was too pale, or the wrong colour, or the development unskilled.—I am, yours, &c., W. E.

THE SPEED OF PLATES.

To the EDITOR.

SIR,—In these days of stale jokes, it is pleasant to be able to give amusement to anybody, so I do not grudge Messrs. Marion & Co. their little amusement; as for myself, I am too dense to see where it comes in, but no matter. I search my letter in vain to find where I stated that Messrs. Hurter & Driffield had altered their method of speed-determination. I only want the truth, and nothing else, and I have done my best to let your readers have it. Lately, Mr. Driffield kindly honoured me with a visit, *at my urgent and oft-repeated request*, to arrange a standard ferrous-oxalate developer, which had never been formulated, and also to investigate the alteration of speed numbers by development. The result of our experiments, in which Mr. John Sterry kindly gave us his help and advice, was the consent of Messrs. Hurter & Driffield to the double marking of plate speeds, one being the number obtained by the standard ferrous-oxalate developer, the other by the developer published by us and enclosed with the plates. It was also arranged with Mr. Driffield that he and Dr. Hurter should control the ratios of both numbers, and I made the request that both these numbers should be under their control, as both were issued under their authority.

I presume that Messrs. Marion & Co. are aware of the alterability of speed numbers by development? If they are not, at least their Mr. Cowan is. If speed numbers are to be of any use to plate-users, they must indicate the speeds obtainable by the developers in use, and no one with knowledge up to date would, excepting for special purposes, use a developer so slow as the standard ferrous oxalate. What is the use of giving the user a speed number of no value in practical use? The pyro-soda and pyro-ammonia formulæ we publish give a *far higher* speed than the standard ferrous oxalate, as Mr. Driffield clearly saw at our meeting, and surely the user of the plate should know this. I have always received kind and courteous consideration from Messrs. Hurter & Driffield through all my contentions with them as to speed being a matter of development as well as exposure, and they are too enlightened to contest anything that can be shown to them contrary to any theories that they may have formed. For some kinds of plates, I can even uphold all they say in their researches with regard to density ratios. Lately I have made experiments on very slow plates, which, to my surprise, gave me practically the same results with three different developers, whilst quicker plates showed an entire departure from these laws. It would be unreasonable to expect these gentlemen to know all the peculiarities of quick modern dry plates, and their consent to markings of speeds indicative of actual value to the user shows their liberal-minded views and desire for truth. If speed numbers are alterable by development, one number for *all* conditions becomes a mere farce, and I think no one knows this better than Messrs. Marion & Co. We must clearly indicate this alteration to the user.

I am determined for myself to have speed-testing put on a sound and proper basis, feeling as I do that the system of Messrs. Hurter & Driffield is the right one, and only wants being put under scientific and practical conditions. Messrs. Marion's statement that any other speed numbers than that of the standard ferrous oxalate will be at the plate-makers' sole responsibility is incorrect. Both markings will be under their control and authority. Of course, if any maker chooses to adjust his developers to the standard ferrous-oxalate developer, one number will be sufficient, but his formulæ will have no practical value for quick and general studio work.—I am, yours, &c., JAMES CADETT.

Ashtead, Surrey, February 15, 1895.

SOLUBILITY OF THE GELATINO-CHLORIDE IMAGE.

To the EDITOR.

SIR,—I venture to bring to your notice a fact in connexion with gelatino-chloride P.O.P. (with which, probably, you are well acquainted), viz., that the printed image will completely dissolve in the plain hypo fixing bath if immersed *before* toning, but not after.

Albumen paper merely loses strength and fixes a red tint. Don't you think this shows that the toned image ought to be more stable than on albumen paper?

I use "Imperial" paper with gold toning; separate baths. Thinking you might not have noticed this is the excuse for addressing you.—I am, yours, &c., C. J. EMENY.

Walton, near Ipswich, February 18, 1895.

VARIOUS TOPICS.

To the EDITOR.

SIR,—Your valuable and always interesting BRITISH JOURNAL OF PHOTOGRAPHY comes to hand safely. However, it is cold outside, and very little chance just now of using the good ideas therein contained. I, therefore, devote my time inside as much as possible to making a few trials and improving my instruments for future use. I told you I made a light camera, and I have now added a dozen double dark slides made of the same wood, which weigh four ounces each. I don't think you can find many as light in the market, and yet they can be done easily.

I admire the way you go against firms which try to cheat people out of their money with pretended fine enlargements, to the great damage to the photographer generally. Sometimes you even go against people who are less harmful, such as that exhibition of colour photography; but never mind, it is admitted that a Frenchman cannot do much when such a thing happens once in a long time; some people know how to use the invention, however.

Please do not understand from above that I think you are wrong on that fraudulent enlarging firm; on the contrary, you are right, and if I can help on the work I will do so at every chance. The same for some other firms.

Not long ago I saw in your JOURNAL a most valuable invention for rapidly drying negatives. Splendid idea. I arranged my lathe in such a way that I could put a negative on it, and turn, turn, turn at the rate of at least one thousand (1000) turns a minute. I just wanted to see how much; that is, in how short a time I could dry a small 5 × 7 negative. I turned the negative at the above rate for forty minutes, and it was about *half dry*. Next!

Here is my way of doing it more rapidly, and certainly less tiresome: In winter I set the negative on a drying rack on the floor near a stove, in summer in a draught in a warm place, or in the sunlight. I also avoid in so doing the possibility of enjoying the knocking off of a nail or finger joint.

Some time ago, maybe two or three years, I had a controversy with a friend in regard to the sensitiveness of plates. Was a plate more sensitive before development or during that operation? I said during. To set matters right I inquired from THE BRITISH JOURNAL OF PHOTOGRAPHY, and the answer came, before development. For the time being I accepted it; however, I was pretty sure personally that it was during development. Why? Because you read so often about *covering* the dish during development, which should not be so necessary if the sensitiveness was reduced as you say. Another reason for my saying it is that long ago (say fifteen years), when I made collodion emulsion for dry plate work, I used to advise, after trials I made, to flow the plate, previous to exposure, with the developer to obtain more rapidity and consequent sensitiveness. I think I even read not very long ago about fuming the plates before exposure, or flowing with some ingredient used in developing to the same effect. Is a plate more sensitive before development or during that operation?

Some people like to see pictures very sharp and some others a little fuzzy. Here is a way to satisfy both. Take the negatives as sharp as possible to satisfy one kind, and then make with the camera a sharp positive, from which in turn you can make a negative the same way, same size or enlarged, which will contain all the fuzziness desirable by focussing to that effect.

I wrote to you a few days ago asking you why I was unable to obtain a negative now, and since perhaps two years, of the same grey colour I used to have for over ten years previous, and as transparent. The negatives I get now are yellowish or pyro-stained, and harder to print than before. If I say two years, this includes summer and winter, so that your answer to above inquiry does not give the reason why; besides, my developer is, and always has been, one and the same since fully fifteen years, viz., pyro, bromide of ammonium, nitric acid, and ammonia, same proportions. Perhaps by asking further of your numerous readers, something more may be learned. Do the gelatine plates begin now to get into trouble the same as albumen paper? Blisters were unknown in early days, but now they are common. I do not remember, in the beginning of gelatine dry plates, of any cleaning or clearing solutions being necessary, and it seems to me that this item has only been found necessary in the last two or three years, and not before. What is the reason for this? Has pyro degenerated into a badly manufactured stuff, or is it the gelatine which is of inferior quality? I wish I had a plate several years old to be able to compare. Why does pyro developer stain now so easily that manufacturers have to give out with their notices or directions for use a clearing solution when they did not have to before?—I am, yours, &c.,

A. LEVY.

Asnières (Seine), February 16, 1895.

ALIEN SKIES.

To the EDITOR.

SIR,—I am glad to hear that Mr. Hector McLean's process is comprehensible by those who know all about it, as I feel sure that from his explanation no one else would profit.—I am, yours, &c.,

J. E.

GREAT INTERNATIONAL PRIZE COMPETITION AND SUMMER PHOTOGRAPHIC EXHIBITION,

ARCADE GALLERIES, ROYAL AGRICULTURAL HALL, LONDON, N.
JUNE 29 TO JULY 6, 1895.

To the EDITOR.

SIR,—Will you kindly announce the above Exhibition in your columns? It is a well-known fact that the majority of Photographic Competitions and Exhibitions are held during the autumn and winter months, when small Society competitions clash one with the other. It has therefore been decided to hold the above in June, 1895. This Exhibition will run concurrently with the International Tobacco Trades Exhibition.

Handsome medals and other prizes will be placed in the hands of the Judges with which to award meritorious work. Owing to the space being limited, there will be a Selection Committee, and therefore acceptance and hanging of any picture will in itself be an honour.

The great feature of the Exhibition is that the prints need not be framed, thus doing away with the expense of frames, railway carriage, &c., the only outlay being postage and the entrance fee of 1*s.* per print.

Special efforts will be made to obtain representative exhibits from Australia, India, New Zealand, America, Japan, France, Germany, Belgium, Holland, &c., and photographers abroad are earnestly invited to compete.

Prospectuses and full details will be ready shortly, and will be sent upon receipt of name and address. The entries close and exhibits must be received not later than June 10, 1895.—We are, yours, &c.,

WALTER D. WELFORD, *General Manager*,
59 and 60, Chancery-lane, E.C.
PERCY BARRON, *Assistant Manager*, 222, *Strand, W.C.*
London, February, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, complete outfit half-plate, Lancaster's preferred. Will give backgrounds painted as desired.—Address, E. A. RIGBY, Artist, 12 Eustace-street, Dublin.

Will exchange dulcimer cost 5*l.* 5*s.*, quite new, for whole-plate camera, with rapid rectilinear lens, &c.—Address, HENRY LAND JEFFRIES, 4, Alban-place, Maidenhead.

Will exchange 10×8 lens (Levebour's) for a good interior background, 10×8 or 8×8. One cabinet bar burnisher exchange for curtains.—Address, N. HUNTER, Photographer, Port Glasgow.

I will exchange my lady's six-stringed banjo for a quarter-plate changing bag (by sight) or four of Tylar's quarter-plate double metal slides.—Address, E. H. BYSHE, Belmont, Knollys-road, Leigham Court-road, Streatham, S.W.

Wanted, air brush, 12×10, wide angle (Ross), 4D Dallmeyer. Exchange 2B patent J.H.D., 18×16 Ross's orthoscopic, Vogel 10×8 W.A., Marion 15×12 camera, with three slides and case, nearly new, half-plate long extension studio camera, Marion studio stand, Ash B, fifteen-inch hot roller, Moss & Mitton; all in first-rate condition.—Address, A. COX & Co., Tavistock-chambers, Nottingham.

Two backgrounds, snow scene, and seascape, offered in exchange for interior and exterior backgrounds; also Dallmeyer's No. 2 (whole-plate) wide-angle landscape lens in exchange for 12×10 triplet, Dallmeyer or Ross; a Meagher's repeating *carte-de-visite* studio camera, and Dallmeyer's stereo camera, and stereographic lens, in exchange for backgrounds or rock-work seat.—Address, J. W. HILDER, South-parade, Matlock Bath, Derbyshire.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Alfred Knott, Oldham.—*Portrait of Rev. G. D. Grundy.*

George Taylor & Son, Bishop Auckland.—*Group of Wesleyan ministers, local preachers, and circuit stewards in the Bishop Auckland circuit*, 1893.

C. F. DICKINSON.—Cutting received and noted. Thanks.

R. E. S.—Imperfect fixation is the cause of the yellow patches on the prints.

W. J. BENNETT.—No; do not part with your property unless money is deposited against it, or you have satisfactory references.

J. ROBERTSON.—The print is fairly good; it is perhaps slightly over-printed and over-toned, and the negative looks as if it were spotty.

JAMES HYND and C. J. T.—We will with pleasure forward letters to the gentlemen named. We do not as a rule give contributors' addresses.

HYPO.—*Le Moniteur de la Photographie*, published at 55, Quai des Grands Augustins, Paris; *Bulletin* of the Association Belge de Photographie, published at Palais du Midi, Brussels.

ALIQUIS.—We have only tried the paper in the apparatus supplied for its use, the "Auto-Copyist." So long as the paper is secured firmly, on a flat, even surface, that is all that is necessary.

ISAAC.—Apply to R. Child Bayley, Assistant Secretary, Royal Photographic Society, 50, Great Russell-street, W.C. You are evidently a very careless, unintelligent reader of this JOURNAL.

JNO. WATSON.—1. Undoubtedly you would be liable. 2. An indemnity would not avert proceedings against you, but would only be an undertaking to reimburse you in any penalties, &c., that might be recovered against you.

A. F. P.—The formulæ given in the current ALMANAC, and the article by Mr. W. B. Bolton in our LANTERN SUPPLEMENT for the 1st inst., on "The New Collodion Emulsion or Transparencies," will, doubtless, answer your requirements.

M. S. (Fraserburgh.)—As the original is on grained paper it will be impossible to make an enlargement from it that does not show a grain. The example sent is very fair indeed, and, in our opinion, the slight stippled effect is more pleasing than otherwise.

ENLARGER.—Although you have strengthened the bath, it still appears to be very weak for the amount of iodide and bromide with which the paper is prepared. We should advise you to reduce the latter and increase the former considerably. That will give greater vigour.

J. BINGHAM.—The frilling is, without doubt, brought about by the warm developing solution. When it is recommended to warm the developer at this season of the year, it is not intended to be made hot. If its temperature be made and maintained at 60° to 65° Fahr., that is all that is necessary.

H. FRY asks "what size lens he should require to make a 30×25 enlargement from a cabinet landscape negative."—A lens of the same focal length as the one with which the original was taken will do. Any lens that will cover a cabinet size will also answer for making an enlargement from it, no matter what size that may be.

ARTISTIC says: "Can you please state where lantern slides can be loaned for a triple that give the colours according to nature? I think the invention is due to Ives. An artist friend is going to give a lecture on Art, and would like to introduce these slides if they could be loaned either privately or through the trade."—To our knowledge such slides are not commercially obtainable.

F. B. W. (Corris).—Better write to the maker of a lens for a catalogue, and, from the price given there, you will be able to judge what the second-hand lens will be worth to you. We do not value second-hand, or any other apparatus. We think there must be some mistake, as we should surmise that the maker would not send out a *carte-de-visite* lens with a fixed stop of half an inch.

B. TYLER sends a portrait group of two children, and asks for "any means of stopping out the hand on the little boy's shoulder. I expect a good order, and am anxious to get him out of the group as neat as possible."—The only way to get rid of the hand is to scrape it out in the negative, and then fill in its place by neatly retouching. If you are not skilful in the use of the knife, the negative had better be entrusted to a good retoucher.

MANCUNIAN.—1. No. 2. We cannot give the exact date, but believe that the last patent was taken out in 1888. 3. The commercial salt, we believe, answers; it may be ordered of any photographic dealer. 4. If you procure a copy of Pizzighelli & Hubl's book on *Platinotype* (price, we believe, 2*s.*), from the Assistant Secretary of the Royal Photographic Society, you will obtain the best and most reliable information on the subject that has been published.

MOUNTS says: "I should like to know your opinion of the work on the enclosed cards; they are supposed to be blocked in white. I complained to the makers, but they insist that they are properly done. Would you kindly advise me?"—The mounts *are* blocked in white, and the blocking is neatly done. Of course, the mounts being such a pale and delicate tint, the lettering does not show so conspicuously as it would have done had they been of a darker tone.

N. H. P. G. sends us the following cutting from a local paper and asks if it is correct: "A person who has had his likeness taken by a photographer can object to his photograph being displayed in the latter's window, and can, if necessary, obtain an injunction against him in the county court for continuing to expose the photograph to public view, and obtain damages and costs for its having been exposed after his request that it should be withdrawn."—Yes, quite correct.

T. C. MICHELL.—We should certainly not advise you to commence experimenting in collotype with extemporised apparatus, particularly such parts of it as the drying arrangements. Temperature and time in drying of the plates are important factors in the process, and it is necessary that they be under perfect control. A box of the design given in the book can be constructed at a moderate cost. The Albion press you have will do very well for plates up to 12×10, provided, of course, the bed is perfectly true, so as not to break the glass.

F. GUTEKUNST writes: 'Being interested in the paragraph on p. 44, BRITISH JOURNAL OF PHOTOGRAPHY, January 18, 1895, on "Autotype Platinum Paper," I write to ask if you can give me any information concerning the same? Is the paper in the market, and who is the maker, and can you give me the address?—In reply: We believe the paper is on the market, and can be obtained of the Autotype Company, 74, New Oxford-street, W.

BERT writes "for any information as to the best, cheapest, and most practical stove for heating a studio 36×18×18 feet high at ridge. There is a lot of glass, and consequently it requires a stove that would generate a good heat."—We cannot recommend anything better than one of the "slow-combustion" closed stoves, of which there are several patterns, but all more or less on the same principle. For that size studio a somewhat large one will be required. In fixing, it will be well to keep as much of the pipe from it within the building, so as to secure as much of the heat as possible.

CASCIANI.—We have no doubt that the ferrous oxalate developer can be used for the plates referred to; but we have never ourselves tried it with them. If the "saturated" solutions are not allowed to fall below about 60° Fahr., they may be considered as standard solutions in practice. From the table of solubilities given in the ALMANAC solutions of definite strength may be compounded that can be used without dilution. It should, however, be borne in mind that concentrated solutions of sulphate of iron keep better than dilute ones. Hence saturated solutions are usually recommended.

T. W. WARD complains that in mounting "opalines" the gelatine sets before he can get the prints on to the glass, and then air bubbles cannot be avoided; also the pictures will not stick. He says he uses Heinrich's best dry-plate gelatine.—This gelatine is not an easy one to use for the purpose, even when it is very much diluted; nor, indeed, are any of the gelatines of this type, as they are not adapted for the work. What is required is a gelatine of a slower setting kind, such as Nelson's No. 2 soluble, or Cox's soup gelatine. These gelatines have a slight colour, but, in the dilute way they are used, it will have no effect on the purity of the whites in the finished picture.

THE SEESTU PRESS writes: "We intend issuing a local portfolio, and will have occasion to reproduce old photographs which are far gone. This we intend doing by means of wash drawings. In copying a photograph—which may be copyright—by this process, do we make ourselves liable for infringement? The photographs, as a rule, will require so much touching up as to make little more than the general subject-matter of the photographs perceivable. We understand we do not interfere with copyright, it being our business to reproduce from wash drawings, and not original photographs. Are we right? Please say."—If the reproduction, whether wash drawing or any other, be made from a copyright photograph, it is a piracy, and will render you liable for penalties and damages as well. No doubt the owners of the copyright will give you the right to reproduce the pictures on payment of a fee.

A. B. (Wigton) asks: "1. Is there any way of fixing crayon-work on bromide enlargements, so that it won't come off to the touch? 2. What bath would you recommend for Solio paper to give reddish or warm tones, such as the combined bath gives, but not a combined one? 3. Would the combined bath give more permanent prints if the alum was left out, and the prints get a slight washing before being put into it? 4. What formula for a pyro developer would you recommend for a short exposure in the studio on Ilford plates?"—1. The colours, on drawing-paper, are sometimes fixed by floating the back of the picture on skim milk; but whether that will answer with bromide paper, we cannot say. Perhaps some reader can give the desired information. 2. The sulphocyanide bath. 3. Yes. 4. The formula is issued by the Ilford Company. It will be found on page 877 of the ALMANAC.

COLLODIO NOVICE writes: "I should be grateful if you could help me out of a difficulty I have experienced with collodio-bromide unwashed for transparencies. The formula is by Captain Abney and given by the Rev. Locke Macdona in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1883, page 17. All my chemicals are good, the cotton by Hopkins & Williams, and high temperature. The emulsion mixed nicely; when all but about eight or twelve drops of the alcohol zinc remained to add, emulsion deposited granular particles on sides of bottle. All was added and ripened for the time stated, then filtered through cotton-wool; but, on coating the plates, there is the heavy deposit which you will see on the plate I send. The plates are right in every respect but for this fault. They give good density and clearness, and I could not wish for a better plate. Is there not an excess of zinc? I only made one ounce of emulsion."—As the emulsion works satisfactorily, there is not much the matter. The defect complained of is due to imperfect filtration. The proportions given are correct. Our correspondent should make his emulsion in larger quantity the next time. Some of the trouble will then be avoided.

CONTENTS.

	Page
NATURALISTIC FOCUSSING	113
OWNERSHIP OF NEGATIVES ONCE MORE	114
HEATING STUDIOS	115
JOTTINGS. By COSMOS	116
THE SCREEN AND ITS EFFECTS. By EDWIN C. MIDDLETON	118
SIMPLE APPARATUS FOR TESTING THE SPEED OF SHUTTERS	118
PHOTOGRAPHIC SOCIETY OF IRELAND'S EXHIBITION	119
SIMPLE SUBJECTS AND THEIR TREATMENT	119
EXHIBITION AT LEICESTER	120
PHOTOGRAPHERS' BENEVOLENT ASSOCIATION	120
OUR EDITORIAL TABLE	121
NEWS AND NOTES	121
RECENT PATENTS	123
MEETINGS OF SOCIETIES	124
FORTHCOMING EXHIBITION	125
CORRESPONDENCE	125
EXCHANGE COLUMN	127
ANSWERS TO CORRESPONDENTS	127

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1817. Vol. XLII.—MARCH 1, 1895.

ASTIGMATISM: WHAT IT IS AND WHAT IT DOES.

Since by recent discoveries in the glass-maker's art, and in new properties in certain of his productions, the terms "astigmatism" and "astigmatic" or "non-astigmatic" are becoming more common than they were only a few years since, we find them occasionally glibly made use of by some who have no idea of what is meant by such terms. Questions are sometimes asked about astigmatism of about as intelligent a nature as was put by a purchaser of a lens who stipulated that the one to be supplied must have an optical centre, and that, if this wore out by fair usage, another optical centre must be refitted to it!

It is only since the advent of photography that astigmatism could possibly have applied to any optical instrument, for in no other than a photographic lens is there any recognition of the transmission of a ray obliquely through it, and obliquity of transmission is a condition inseparable from the production of astigmatism, or *astigmation*, as it formerly was, and still is occasionally, called. There is no astigmatism in a telescope object-glass when employed as such, because the rays pass through it axially and not obliquely; but, if mounted as a photographic lens, it speedily shows that it, too, obeys the law which all achromatic lenses have hitherto recognised as regards astigmatism.

What, then, is the nature of astigmatism, and by what means is it to be discovered? Let us take any ordinary achromatic objective and subject it to critical examination by means of the ground-glass focussing screen of the camera. The object to be focussed may be a circular white object the size of a threepenny piece, or it may, perhaps with greater advantage, be a sharply cut white cross, or both, mounted upon a black ground for facilitation of clear observation, or a black cross drawn upon a white card, the limbs of the cross being placed vertically and horizontally. The lens in the camera should be used without a stop, for the larger the aperture the more apparent will be the phenomenon. Let the camera be placed so that the image of the foregoing objects shall be sharply focussed on the centre of the ground-glass screen, and it will be found that the circular one will be quite round and distinct, while both the vertical and horizontal limbs of the cross will be equally distinct, while, if the lens be racked in or out of focus, both will preserve their shapes notwithstanding the indistinctness of outline necessarily caused by this treatment. The camera is next rotated until the objects are brought to the extreme side of the focussing screen, and the racking in and out proceeded with as before. Neither the disc nor the cross will be found to be sharp anywhere, but it will be noted that, at one position, the disc will be elongated vertically, being oval in shape, while, on racking the lens a little the other way, the elongation will now be horizontally, but the mean of the two distances will not show it to be of circular form. With the cross, at one distance the horizontal bar will disappear almost, if not altogether, leaving the vertical one only sharp and distinct, to disappear in its turn when, by an opposite turn of the rack, the horizontal one is brought into visibility. The distance through which the lens has to be moved to produce these phenomena shows the amount of astigmatism possessed by that individual lens at that degree of distance from the centre of the ground glass, for, at the centre, as we have shown, sharpness and correctness of form prevail, the amount of astigmatism usually increasing as the centre is departed from. We say *usually*, but this is not invariably the case, for, in making charts of the amount of astigmatism given right across the whole field by lenses in our own possession, we find that over a considerable portion of the surface adjoining the centre there is no appreciable astigmatism to be found until we approach much nearer to the margin. Noting that there are two foci to every point projected upon the focussing screen, and that one gives the image as a vertical line and the other as a horizontal line, it is a comparatively easy matter to construct a diagram or chart for every lens that passes through one's hands which will show not only its curvature of field, but the amount of astigmatism from perfection or freedom from this evil at the centre to the full development of the unwished-for propensity at the margin, represented by two lines running alongside each other, and usually drifting apart as they approach the sides of the plate. It would occupy too much space to give in this article an account of the astigmatometer we devised and constructed for the purpose implied, suffice it to say in the mean time, and pending its publication on some future occasion, the whole capabilities, the failings, and, in short, the character in this respect of a lens may be delineated with accuracy on a sheet of paper the dimensions of the ground glass, and this in about ten minutes after erecting the camera.

Having said so much about the nature of astigmatism, we shall dismiss its cause in a rather summary manner, contenting ourselves by a repetition of the explanation we once gave when bringing the subject before the now defunct Photographic Society of Scotland. Astigmatism, we said, arose from the obliquity of the cylindrical pencil of rays causing the aperture

of the lens to cut it in an elliptical form. As the refractive power of the margin of the lens is equal all round, it follows that the refractions at the horizontal margins of this ellipse are as great as at the vertical margins, consequently the inclination of these rays towards one another is as great in one case as in the other; or, to put it in another form, the angle at the focus, formed by the extreme rays of the pencil, is the same horizontally as perpendicularly; but, as the base line vertically is longer than the horizontal one, it follows that the focus of the vertical rays is further from the lens than the horizontal ones, so that, for oblique rays, there are two pseudo-foci. Now, at the short focus, a point will be represented by a vertical line; at the long focus, by a horizontal line; and, intermediately, by a combination of both. This accounts for the impossibility of getting anything sharp at the margins when some lenses are being employed. It is possible to arrange the curves of the lens so that even with full aperture there shall be what photographers term great "depth of focus," the meaning of which is, that no part will be in sharp exact focus, but that objects situated at varying planes shall be all pretty near it. A lens of this character is unsatisfactory, and is to be avoided.

A small aperture to a lens improves the marginal definition, the reason of this being that, as each point of the subject is represented by an irregular dot, the smaller the dots the less does their irregularity interfere with one another. The marginal smudginess which thus results from astigmatism is, as we have hinted, greatly minimised, and in some cases practically extinguished, by a small stop.

But lenses, formed of special glass, have of late been placed upon the market with a claim of their being free from astigmatism, even when used with a large aperture. This we rejoice at, not merely as an optical feat once thought impossible of accomplishment, but on account of the additional power thus placed in the hands of photographers who like good definition all over the plate, but who may not desire it at the expense of having to secure it by the use of a small diaphragm. It is a pity that objectives of this nature, from the complexity of their construction—some having as many as eight individual lenses—and from patent restrictions, are not likely to be supplied at what have been designated "popular prices." The influence of time may, however, aid in the amelioration of this drawback.

Chemically Dry Hypo.—In order to test for the presence of hypo in small quantities, iodine solutions are, as we need scarcely inform our readers, made use of. But, as a preliminary means of standardising these latter solutions, it is desirable to have pure and dry sodium thiosulphate ("hypo"). A writer in a foreign chemical journal states that, if the crystals be powdered, then washed with ninety-six per cent. alcohol, and, finally, with dry ether, the latter being removed by a current of air, a product absolutely free from moisture is obtained, which, if satisfactory in other respects, constitutes a valuable reagent for the purpose we have described.

Incandescence or Glow Lamps.—A very valuable paper, written by Professor Ayrton and Mr. Medley, has been read at the Physical Society upon this subject. Contrary to previous experiences, it was found that in the new make of lamps examined the longer they were used the better in all respects they became. Again, in the older form it was found that after a while so much blackening of the inside of the globe took place as to render it advisable on the score of economy to destroy it and place another in position; the very opposite was the case with the new Edison-Swan lamps. The following are some of the conclusions arrived at in this regard:—The maximum rise of light recorded during the life of any lamp was 45 per cent. With lamps of the type examined there is no point at which it becomes economical to discard a lamp before its filament actually breaks. No marked economy can be gained by over-running such lamps, *i.e.*, by using pressure exceeding 100 volts.

An Atmospheric Purifier.—We may perhaps be permitted to refer once more to the old fallacy not yet exploded of the value of snow as a substitute for pure water: for, in an article under the above title just published in the *Chemical News*, we have a claim made in a concrete form, which, if substantiated, should for ever banish the old figment. Mr. Jno. C. Coppack has examined a series of examples of fallen snow, and gives figures of the residues he obtained. "These figures," he says, "point out the value of a fall of snow from a manurial point of view, and also its value from a hygienic point of view. In a city where the air is often saturated with carbon particles, a fall of snow may be regarded as a mechanical contrivance of no mean order." In other words, instead of snow being pure water, it is an absorbent agent for all the foul matter in the air which it clings to in its fall. One example may suffice, in snow melted to a gallon of water there were:—

Total solid matter	17·32
Mineral matter	6·25
Carbonaceous matter	11·07
Free ammonia	4·65
Albumenoid ammonia	6·5
Oxygen to oxidise	1·16

THE AMMONIUM CARBONATE DEVELOPER.

A few months ago, when dealing in these pages with the important subject of development, I intended, in the course of my introductory remarks, to make allusion to the benefits that would accrue to photography from a systematic and scientific examination of the different developers, conducted for the special purpose of obtaining such a knowledge of their action and properties as could be stated in terms possessing a strictly comparative value. Our information on this head is, unfortunately, wholly inadequate to the requirements of the present day, and, of our many eminently qualified writers on photography, none has as yet made a serious attempt to remedy this state of matters by supplying what is felt to be a want in the literature of development. No doubt the task is one of great magnitude, and, at first sight, would seem to present many difficulties. These, however, are less real than apparent, and I am convinced that, were the subject taken up in earnest by a number of independent inquirers, the results obtained would prove of lasting service to the general body of photographers, and in particular to those of that body who have little or no spare time in which to experiment for themselves. Meanwhile, we must be content to avail ourselves in our every-day practice of such data as we already possess.

As, under the existing circumstances, even the smallest contribution to our knowledge of what may be called comparative development cannot but be acceptable to photographic readers, I have, in the articles above referred to, given, in a condensed form, the results of my experiments on the developing properties of the alkaline carbonates. I do not profess to have treated even this single department of a great subject in anything like an exhaustive manner, but only in outline, my intention being rather to direct the attention of others to a fruitful field of inquiry than to attempt the task of laying down principles of more than merely general application.

By way of supplement to those former articles, I here intend to speak more particularly of a developer which has been hitherto but imperfectly studied, though in many respects it is likely hereafter to prove a formidable rival to the better-known developers of the carbonate class. I refer to the ammonium sesquicarbonate developer.

I have made inquiry with the object of learning how far, if at all, the remarkable developing properties of the salt in question have received recognition in the past. I find that in several of the early dry-plate processes (and notably in the Beechey dry-collodion process) a developer composed of pyro, ammonium carbonate, and a soluble bromide was recommended as being more satisfactory in action than the acid pyro developer formerly employed. With the

introduction of gelatino-bromide plates, the new developer seems to have been at once discarded in favour of pyro and ammonia, and the latter developer has continued to maintain its popularity in the face of new comers up to the present time, though its supremacy has been sometimes threatened.

I have not met with anything in the shape of evidence as to the causes which led up to the speedy disuse of the one developer and the general acceptance of the other. This point is far from clear; but several reasons might be adduced to account for the change. Probably enough, certain defects inherent in the earlier dry processes may have been attributed to the developer employed rather than to their true cause. Consequently, when the modern dry-plate process made its appearance, it may have been thought necessary to modify the constitution of a developer which, though through no faults of its own, had ceased to be regarded with favour.

From what has just been said, then, it will be seen that the developer of which I am writing is no novelty in the absolute sense of the term; but, seeing that, so far as I can learn, it has altogether failed to secure recognition as a developer for gelatine plates, some information in regard to its capabilities in this direction will, I think, be new to the readers of this JOURNAL.

As a preliminary observation, I think we may take it for one of the axioms of photography that nowadays the only developers that are likely to gain in popularity are those which in operation are not dependent on the mutable conditions that are met with in practice. To put it briefly, there is no general desire for a multiplicity of developers, but rather for a single developer which shall be capable of answering all requirements. These requirements are necessarily many. I am, however, spared the necessity of considering them in detail, and this for a very important reason.

Apart from the process of development, the difference between success and failure in photography is almost wholly a matter of length of exposure. The exposure is, in fact, the combination of a number of previously separate items, each of which has, or should have, its due consideration before the photographer passes judgment. Once this is admitted, there remains but the question of the developer that is to be employed.

Other things being equal, one that will ensure his obtaining successful results, however varied the exposures may be, will, of course, have the preference. Exposure, therefore, will be considered the feature of primary importance in the following remarks upon the ammonium-carbonate developer.

I may remind my readers that, in my former brief notes on this developer, I showed that the presence of a soluble bromide vastly enhanced the beauty of the results, and served as a safeguard against fog and marginal stains.

Potassium bromide will, accordingly, be found a constituent of each of the formulæ about to be submitted to notice.

My first experiment was made on September 25 last.

A dry plate of medium rapidity was selected, and exposed shortly after midday on a landscape subject. The exposure given was five seconds, and was made during bright but not intense sunshine. The subject, I may remark, was of a panoramic character, the chief objects of interest lying in the planes of the distance and middle distance.

The following developing formula was made use of:—

Ammonium sesquicarbonate	12½ grains.
Potassium bromide	½ grain.
Pyro	2¼ grains.
Water	1 fluid ounce.

The development lasted for ten minutes. The negative so produced was evidently a trifle over-exposed, as was evinced by a certain deficiency in the amount of contrast obtained on the plate. Nevertheless, seeing that the details of the subject were rendered with great fidelity and sharpness, this defect did not seriously detract from the success of the result.

The second and third experiments were made on the following day. On this occasion the two plates that were employed were from a slower brand than the first plate, and in order that I might give in each case the same exposure as before—namely, five seconds—I made use of a lens stop of increased diameter.

In the second experiment the picture was again a landscape, but one possessing a considerable range of contrast, along with a principal subject in the form of a figure foreground. The exposure was made about 11.30 a.m. The intensity of the sunshine during the exposure was, so far as I could estimate, not appreciably different from what it was on the previous day.

The developer was made up according to the formula already given. The process of development lasted for twelve minutes. The negative obtained was of excellent quality, though the density was a little in excess of what it should have been, a circumstance due either to over-exposure or over-development, but probably to the former.

Looking at the results in these two cases, it seemed clear that one of two things was required, either an increase in the proportion of the restraining bromide; or a diminution of the duration of the exposure. The first alternative seemed the more practicable course to adopt, so I increased the proportion of potassium bromide present in the developer from half a grain to one grain per fluid ounce.

The second plate was exposed out of doors on a portrait subject at midday during bright sunshine. The modified developer was made use of, and in fourteen minutes' time the plate was ready to be removed from the solution, which was accordingly done. A good and brilliant negative was obtained, which showed not the slightest trace of over-exposure, the range of contrast exhibited therein being, if anything, a little too pronounced.

It will be observed that this satisfactory result was obtained without any increase having been made in the proportion of the pyro present in the developer. This is a circumstance deserving of particular notice, and one to which I shall again have to make reference in the course of this article.

My fourth experiment was made on October 19. Having selected a plate of extreme rapidity, I found it necessary to reduce the exposure from five to three seconds. The subject on this occasion was wholly an architectural one, and consisted of a group of connected buildings occupying the whole of the middle distance. The structural details were of such a character as to produce strong contrasts of light and shade. The exposure was made about 12.50 p.m., bright sunshine again prevailing. Before exposing the plate I had already taken another picture of the same subject on a similar plate, and under like conditions. This duplicate plate received an exposure of one-fifth of a second. The plate first mentioned was then developed in a solution of the formula:—

Ammonium sesquicarbonate	12½ grains.
Potassium bromide	1½ grain.
Pyro	2¼ grains.
Water	1 fluid ounce.

When nine minutes had elapsed the image began to make its appearance. The process of development was slow, and lasted in all for thirty-five minutes.

The image thus produced was found to be beautifully clear, and of excellent printing quality. The details, without being too hard, were rendered with sharpness, and the broader effects, due to the half-tones and shadows of the subject, were reproduced with the required degree of intensity.

For the development of the other plate I employed a solution containing to each fluid ounce:—

Anhydrous potassium carbonate	7¾ grains.
Potassium bromide	⅓ grain.
Pyro	2¼ grains.

The development was completed in six minutes' time. The result was a thin, yellow negative, fairly vigorous in breadth of tone contrast (though decidedly inferior in that respect to its companion negative), and not apparently under-exposed. The first negative, I may mention, showed not the slightest trace of over-exposure, *although the exposures given in the two cases were in the ratio of fifteen to one.* I shall revert to this fact at a later stage; but at present it seems only proper that I should specially draw attention to it as an important item in the evidence.

The fifth and sixth experiment of the series were made on October 22. In both cases the subject was an architectural one, with a figure foreground. The plates now exposed were of the same degree of rapidity as those that were selected for the second and third experiments, and it is well that I should here state that, in all the experiments subsequent to the sixth, plates from the same batch were employed. The pictures were taken about two o'clock. In the first case, the light that prevailed during the operation was of moderate strength, and an exposure of four seconds was given. In the interval that elapsed between the experiments the light grew weaker, and, on account of this circumstance, an exposure of five seconds was given to plate number two. The difference in the strength of the light seemed to necessitate the employment of a developer weak in bromide. As half a grain per fluid ounce seemed a sufficient quantity to meet the requirements of both cases, I prepared a sesquicarbonate solution according to the formula given at the beginning of this statement. At the expiry of thirteen minutes the image on the first plate began to show itself, but very faintly.

It was soon evident that the process of development would be a lengthy one. Altogether it extended over forty-six minutes. The finished negative, though thin and lacking in brilliancy of contrast, was in other respects fairly satisfactory. The details of the original were rendered with fidelity and delicacy, a fact which was still more apparent at a later stage, when a print had been obtained from the negative. Perhaps the most noteworthy feature was the entire absence of marginal or other stains, under circumstances where blemishes of this description were naturally to be expected. The development of the second plate was conducted in all respects in the same way as the first, and, as before, lasted for forty-six minutes. The image again made its appearance at the expiry of thirteen minutes. The negative obtained was a littte thinner than the other, but very similar in regard to density, amount of contrast, and delicacy of detail. The prolonged action of the developer had again failed to produce the least staining of the film.

The seventh, eighth, and ninth experiments were made on November 12. The first subject was an architectural one—a ruined castle—with a broken foreground, the latter consisting of a grass-grown moat, overhung by masses of rock and fragments of flanking walls. The first plate received an exposure of six seconds, at 11.30 a.m., in bright sunshine, the illumination of the field being perfectly uniform. The second plate (a duplicate) received an exposure of eighteen seconds at 11.31 a.m. The same lens stop was again employed, and the sunshine did not vary in intensity in the interval between the exposures. A slightly weaker form of developer was employed, the formulæ being, for experiment 7 :—

Ammonium sesquicarbonate	12½ grains.
Potassium bromide	1 grain.
Pyro	2¼ grains.
Water.....	1½ fluid ounces.

For experiment 8—

Ammonium sesquicarbonate	12½ grains.
Potassium bromide	2 „
Pyro	2¼ „
Water.....	1½ fluid ounces.

In developing the first plate, the image began to appear in two minutes' time, but took eighteen minutes more to attain its full density. A very beautiful negative—one which seemed to approximate as nearly as could be imagined to what a perfect negative should be—was obtained. Its brilliancy, sharpness, and well-balanced contrasts were remarkable enough to invite the question whether as fine a result would have been produced by means of any other developer.

The other plate was then immersed in the special developer which had been prepared for it. Three minutes elapsed, and then the image began to show itself. When eight minutes in all had passed, three-quarters of a grain of pyro were added to the ounce and a half of solution in the bath. The development lasted altogether for twenty-six minutes. A fine negative was produced, scarcely inferior in quality to the other, and not visibly so except when the two were viewed side by side. All the difference observable was that the contrasts in the second negative were a little heavier than those in the first. This defect was, doubtless, due to the intensifying action of the additional pyro that was added during the development.

In conclusion, I may add that the image showed not the least sign of excessive exposure. This fact should be carefully noted, as I shall bring it forward again when I have to speak of the conclusions which may be drawn from this series of experiments.

MATTHEW WILSON.

CONTROL IN DEVELOPMENT: A REPLY TO MR. EDWARDS.

[Photographic Club.]

MR. EDWARDS'S case is that the scale of tones in a negative can, irrespective of alteration caused by time of development, be greatly altered by the composition of the developer.

To illustrate this case he sends two more examples, in which, as in all his examples I have seen, no true comparison can be made, as the halves of negatives compared are developed to different stages, no two corresponding tones being equal in printing opacity.

My case is, "That the selection of the developer is only important in as far as it ensures freedom from fog and a convenient length of development."

To illustrate this, I have previously given a number of examples in which two widely different developers have been compared, in which the upper tones have exactly matched in printing density, the remaining gradations being also exactly alike. I now give several more, in which a two-grain pyro-soda developer (restrained with one grain bromide, or two grains for great over-exposure) is compared with the Edwards's redeveloper of eight grains pyro, sixteen grains bromide, seventy grains soda, and in which I do, what Mr. Edwards claims to be impossible, get identical results with the two.

The whole question hinges chiefly on the matter of *fog*, an influence which I have always excepted in making my claim. If Mr. Edwards allows fog as part of a "normal development," I can assent to most of his claims, for fog alters gradation to an enormous extent even when slight.

In my hands (and I suspect in Mr. Edwards's too) a normal (?) pyro-soda developer with no bromide gives decided fog in unexposed parts of the plate. Mr. Sinclair has kindly shown me some comparisons which at first sight seem to confirm Mr. Edwards's views; but fog is present with the normal (?), and absent with the Edwards's developer. Surely the use of sufficient bromide to prevent fog is a recognised necessity with pyro development.

I find, on further trials with over-exposure, that the exception in the matter of fog to my general statement requires further extension.

A moderately restrained developer, which works clean with normal, and even up to ten or more times over-exposure, will sometimes give fog on unexposed parts with greatly over-exposed negatives, and solarisation in the upper tones, while a highly restrained developer, such as the Edwards's, will be free from these defects.

The practice of photographers to use highly restrained developers for over-exposure is therefore correct, and it is much more convenient, in order to complete development in reasonable time, to use them strong in pyro and alkali; but they *do not alter gradation*, they simply allow the gradation, as fixed by the exposure and the stage of development, to be brought out free from fog.

It is interesting to compare Mr. Edwards's statement, "I also find that the time of appearance of the half-tones bears no definite relation to the time required to complete development," with his own record of his trials.

He shows results of four developments, two (in his judgment) giving correct results and two incorrect.

Now, in my last paper I gave (in the final paragraph) the approximate multiplying factors for two-grain pyro and Edwards's strong eight-grain pyro as four and a half and two respectively. Is it a mere coincidence that Mr. Edwards has obtained his best results by using very nearly these multiplying factors, viz., four and two and a fifth respectively?

Now examine his failures. The over-exposure, with normal development, he gave thirty times to (my estimate being four and a half times). No wonder the upper tones are "quite buried," they show great over-density in all parts of the scale in the print.

The normal exposure with Edwards's redeveloper he gave one one-twelfth time of appearance (my estimate being two), and the lower tones "show scarcely any detail," while, as you will see by the print, the upper tones are not developed to the full density of the corresponding half.

I must also draw attention to the fact, illustrated by the prints which Mr. Edwards kindly sent me, that, although he "tried to develop both halves, to give as nearly as possible the same density in the highest lights," he has got widely different density in the high lights.

Does not this illustrate the difficulty an experienced photographer finds in estimating how far to develop when he uses widely different developers? In all my comparisons shown of widely different developers, I have succeeded, using the time of appearance as a guide, in developing to just the same printing density in the high lights. Does not this show that there may be something in the new method?

Mr. Edwards's criticism of the range of one of my sensitometer trials is based on a misunderstanding. The range of actual light action was from 1 to 256, not 256 to 1024 (1 to 4) as he presumed. The graduated examples I now send have a range of exposures from 1 to 256, and, as the range of light reflected from the greatest contrasts in a landscape subject is not more than 1 to 32, this is much more than sufficient.

Examples sent herewith:—

1. Illustrating change of gradation due to different length of development (seven and seventeen minutes) in the same (two-grain pyro) developer free from fog.

2. Illustrating change of gradation due to fog. Two-grain pyro, twelve-grain soda, no bromide, compared with the same with one grain bromide. Result, two corresponding tones alike, but a marked contrast above and below, fog on unexposed part of the first.

Three other examples (landscape normal exposure, landscape

twenty times over-exposure, and sensitometer 1 to 256) comparing two-grain pyro-soda (free from fog) with Edwards's eight-grain pyro-soda redeveloper, and one sensitometer test comparing Edwards's eight-grain pyro-soda redeveloper with the same diluted down to one grain. In all these four examples the gradations of the results compared are practically identical. This is because the conditions as regards stage of development and freedom from fog are made alike in both.

I may be permitted to correct here an error I made in my first paper read to the Club, and also in the instructions published with the eikronometer. I stated that the time of appearance makes allowance for variation in amount of bromide. This I now find is wrong; the addition of bromide lessens the multiplying factor, although it does not alter gradation, provided sufficient was already present to prevent fog.

ALFRED WATKINS.

A FINAL REPLY TO MR. WATKINS.

[Photographic Club.]

WHEN I ventured to challenge Mr. Watkins's statements that "the photographer had no power to control development except by timing," and that "there was no advantage in modifying development to suit various subjects or exposures," I did not for a moment suppose that I was advancing anything that was not perfectly well known to all photographers of any experience. In his present paper, I do not think Mr. Watkins has quite clearly stated the views I expressed in controverting his assertions.

In criticising the last two examples I showed before the Club, Mr. Watkins says no true comparison can be made, because he says the two halves of the negatives are not developed to the same stage. As a matter of fact, there is only a very slight difference in the *printing* density of the highest tone (not sufficient to affect the result in any appreciable degree), although the gradation in the lower tones is entirely altered. You have the negatives before you, so that you can judge for yourselves. I will also ask you to look at the pair of negatives which I first brought to your notice in October last, and in which the development in one-half of the over-exposed negative is purposely not carried to so great an extent, the highest tones being left of less density than those in the corresponding half developed with the highly restrained developer. You will see that all the over-exposed negatives with normal development are quite useless for printing, they have not sufficient contrast, showing that timing is utterly powerless to enable us to produce a good printing negative from a very much over-exposed plate. It matters not whether you get the same density in the highest tone, or more density or less the result is the same, the negative is weak in contrast, flat and worthless unless the developer used is suited to the exposure, or is capable of being so modified as to give the proper gradation.

I notice that the results of Mr. Watkins's later experiments fully confirm my own conclusions, viz., that in cases of over-exposure great power of control is obtained by using a highly restrained developer. In some of the examples now shown by Mr. Watkins, we are asked to compare the results obtained by the formula I have given for a strong highly restrained pyro and soda developer with those obtained by a two-grain pyro and soda developer, also *highly restrained*. Mr. Watkins points out that the results (as one would naturally expect) are practically identical, there is no reason why they should not be so. I have certainly never stated to the contrary, but surely it is preferable to modify the developer and obtain the result in seven minutes instead of seventeen, or half an hour, as the case may be.

Another example sent by Mr. Watkins shows the difference in the results obtained by a normal two-grain pyro and soda developer without bromide, and the same with bromide added equal to half the weight of the pyro. Mr. Watkins attributes the great difference in gradation here seen to "fog," on which he says "the whole question chiefly hinges."

With regard to this question of fog, I confess I do not understand what Mr. Watkins means when he says, "A moderately restrained developer which works clean up to ten or more times over-exposure will sometimes give fog on the *unexposed parts* of greatly over-exposed negatives." Why it should give fog on an unexposed part passes my comprehension. I can only say that, if the results photographers obtain every day with normal development are due to fog, it is one of the most valuable factors we have, and I for one should be very sorry to lose the benefit of its service, especially for rapid exposures or hand-camera work. I suspect, however, that some of the fog of which Mr. Watkins speaks may be due to causes other than the developer. If you examine the negatives I have shown, you will see that those with correct exposure and normal development (pyro and soda without bromide) are quite free from fog. What Mr. Watkins would call fog in the over-exposed plates with normal development is simply the developable action of light carried to excess; it does not appear with the highly restrained developer. With very short exposures, it is desirable to utilise the whole of the light action, and this we can do by using a normal developer, which will give good negatives with less than a tenth of the exposure which would be required with the highly restrained developer used as a normal one by Mr. Watkins.

Mr. Watkins says: "If Mr. Edwards will allow fog as part of a normal development, I can assent to most of his claims, for fog alters gradation to an enormous extent, even when slight." I will reply by saying that I shall be quite content to settle the matter in that way. I am quite willing, if it will please Mr. Watkins, that useful light action shall be called "fog," provided it comes in just the right place in the negative, gives proper gradation, and helps to make the picture.

There are several other points in Mr. Watkins's paper on which I might reply, but I will not tire your patience with any further remarks. It seems to me that the whole gist of the matter amounts to this: If you are content to sacrifice the power of obtaining rapid pictures, and will use Mr. Watkins's restrained developer as a normal one, developing in some cases seventeen minutes or longer, you may be able, more or less successfully, to use the same developer for different exposures and for various subjects, and obtain your negatives by Mr. Watkins's mechanical method of timing; you will also have the advantage of ascertaining, by actual practice, whether it is better, or in any degree simpler, instead of stopping development when, in your judgment, you have obtained the result you desire, to note the time of the appearance of the "half-tones," multiply by a given factor, and stop at the time indicated.

B. J. EDWARDS.

DEVELOPMENT AND FIXING.

[London and Provincial Photographic Association.]

I HOPE that none of you are here to-night under the impression that I have something new to lay before you. Quite the contrary. The object of my paper is simply to raise discussion on a subject about which we irascible lovers of photography delight to have a row. I have been in a few photographic rows and so speak from experience. I hope, therefore, if any one (figuratively speaking) is going to punch my head, I shall still come up smiling to the fray. I feel a little mean over the title of my paper, *Development and Fixing*, for it is really only an excuse to bring up the Hurter & Driffield question again; none the less, I hope my short paper will be of interest, for the reason that I bring before you experimental evidence of the action of variations in development on the plate. I know of no other part of photography that has been more hotly discussed, and with such opposite opinions as this. I feel particularly qualified to speak on this matter, as for the last two years I have had daily experiments on it; it will be hard, therefore, if statements based on hundreds of experiments are not expressing truth.

Some years have now passed since Messrs. Hurter & Driffield's original researches were made, and whilst their method of speed determination remains unshaken, and, indeed, is used by all their scientific opponents, yet their statements with regard to density ratios being unalterable by development have always received opposition, not less by myself than by others. Unfortunately, many people do not distinguish between these statements and their method of speed determination, and condemn *all* their work. This is, no doubt, due to ignorance of their system, indeed very few can say that they have practically worked it, and therefore they are not competent to enter into the matter. There is one question which I always ask those who condemn the Hurter & Driffield system of speed determination, viz., What is the relation of density to exposure and thereby to speed? I have never found one of these gentlemen who would answer this question at all. One notable opponent, when hard pressed by the question, made the desperately sublime reply that there was no relation at all. He couldn't say why. This answer was like that of a blind man declaring that light did not exist because he could not see it. Those, however, who can see it know better.

It is a very remarkable thing that, if you give an average photographer two different plates to compare for sensitiveness in the camera, he at once goes and makes under-exposed negatives of no value for printing purposes. As a rule, they are uselessly dense. Why? In the fond hope of forcing all the detail out, forgetting that his developer is on all parts of the plate at the same time, and giving the same relative action on all of them; but he only looks at his shadows, and when, by forcing, gets them dense enough to see

he points to them as the evidence of speed. You ask, then, what he is going to do with the over-dense lights, and here you put a question that upsets him, for he must admit that they are over-developed; but they are no more over-developed than the shadows. The fact is that the plate wants more exposure to bring the shadows into, or nearer, the period of correct exposure. Within wide limits you get no more relative detail by prolonged development, you only make it more dense, and thereby read density for speed. The developer is not going to stop its action on the lights while the shadows are being developed—why should it? And how beautifully this is shown by the photometer. Over and over again I have developed plates for various times, and though the plates look very different in density, and deceive the eye, the photometer is not to be deceived, and the speed reading remains practically constant. In practical studio work, the operator's anxiety is his density, and as soon as he has reached its limit, if he does not find sufficient density in the detail of his shadows, he fears at once that the plate is under-exposed, and does not go on forcing. He knows instinctively when to stop development; but set him on speed-testing, and away goes his instinct or common sense, if you will, and all regard for density and a printable negative. Now, the H. & D. curve takes all this into account, and the straight line of this curve places the density value in its proper place in relation to speed reading. I do not care who the operator may be, he cannot read comparative speeds with any reasonable degree of accuracy in the camera, unless the negatives are identical in detail *and density*. This is not easy in practice, and is very much a matter of chance, and would have to be the result of many trials, simply because, before speed can be read, density values must be measured; and though it is easy to say that one negative is denser than another, it is not easy to say by how much, and such comparison is like holding a weight in your hand, and trying to estimate its value without a balance.

Again, plates vary so enormously in their density-giving powers, that development for the same time gives no indication of any value whatever. Though, within wide limits, time of development does not alter speed, we have now to ask ourselves what is the result of altering the constituent quantities of the developer. This question is the most important part of my paper, and my answer is that which nearly all of you will cordially agree with. The result is a very great alteration of speed. This has been the *bête noire* of all comparative speed-testing. At all meetings and discussions that I have attended on this subject, and in all papers that I have written, I have pointed out, in common with others, this difficulty as regards Messrs. Hurter & Driffield's statements about density ratios and thereby speed. Until lately, no standard developer has been formulated for comparative purposes, and the result has been that though individually comparative readings have been of value, any readings for general comparison have up to the present been utterly valueless; this standard developer has now been formulated at my urgent request by Messrs. Hurter & Driffield, and for certain purposes will no doubt be of value. I wish, however, to point out that any standard developer is not comparable with others as regards relative equality of action on various plates; for instance, some plates with ferrous oxalate show to advantage, others again give totally different results. In fact, there is no difficulty in practice of getting differences by various developers of over 500 per cent. To give an instance of this, I have heard of one make of plate giving, with the standard ferrous-oxalate developer, a greater speed than with our "velox" developer, whereas, in using our own plates, it would be the other way about by more than 300 per cent. It is clear, therefore, that though a standard developer may be useful for certain comparative experiments, it by no means follows that it would have any practical use where the user of the plate is employing a totally different developer. It is for this reason that it is necessary to indicate to the user of the plate what speed he would be likely to get with the formula or formulæ of development recommended by the maker for use with his particular manufacture. Messrs. Hurter & Driffield have very kindly consented to this being done by our putting *two* numbers on the plate boxes, one which indicates the speed obtained by the standard ferrous oxalate, the other by the first formula enclosed with the plates; in this way we make the actinograph or other exposure meters of great value. You will see by the photographs thrown upon the screen that time of development makes no practical difference within wide limits of the speed of the plate. On the screen you will notice strips cut from the same plate having received the same simultaneous exposure, one strip being developed *one minute*, the second one *two minutes*, and the third one *three minutes*. You will see by the speed diagram that the indicative sensitiveness is the same with all these strips, though developed at such widely different periods of time. This is very instructive, especially when we come to consider the next diagram, which will show you the effect of adding bromide to the developer; here we see that the tendency of bromide is to *increase* density in the high lights and *reduce* it in the shadows, thereby reducing the speed of the plate. You will notice from this diagram that though one plate has been developed for ten minutes as against the other one for two minutes (these strips being also cut from the same plate and having the same simultaneous exposure), yet the one developed for ten minutes, with an addition of bromide to the developer, shows a very considerable reduction in the speed of the plate. As regards the use of check plates, I consider them only a useful adjunct against errors in manipulation. I do not consider them of any use to definitely give the speed of the plate. We cannot define a check plate in its value, and therefore it must be useless as a standard; moreover, we have the very awkward question as to the alteration in the speed of check plates. I believe myself that they sometimes alter very considerably. As far as my own experiments go, it seems that speed is also lost with age, and in some cases very much so; density is also lost, and in some instances fog is increased. If we have to make a check plate by exposure and development, such exposure and development ought to be sufficient for testing the plates, provided that we work under standard conditions and use a standard light that is reliable; such I think we have now in the Pentane Argand of Mr. Dibdin. Perhaps, ultimately, the perfect system of speed-testing will result in giving a curve indicating the spectrum values of the plate; this, however, is an improvement we have to look forward to in the future, meanwhile, for all practical purposes, the method adopted by us is, we consider, good enough. It is only when orthochromatised plates are used that we have to consider ourselves under different conditions, and here, of course, the curve showing the entire spectrum value of the plate would be most useful. These values would, however, have to be tested by the Hurter & Driffield method in just a similar manner to the way we are doing now, only the labour would be very much increased in getting the various values for different parts of the spectrum. No method can be of any use unless the relation of density to speed be properly considered, and this is the masterpiece of Messrs. Hurter & Driffield; they were the first to show it, and on this point their work remains unshaken to this day.

I have now a few words to say upon the fixing bath. I find that saturated solutions of hypo, as a good many others have found, are liable to produce small blisters on the plate quite apart from frilling; moreover, a saturated bath, though fixing *thinly* coated plates very quickly, owing to the fixing being helped by the water contained in the film, yet when we come to thickly coated plates, a saturated bath will hardly fix them at all, as the water is absorbed from the film before fixation is completed, and then the bath seems unable to dissolve the remaining salts of silver. No hypo bath should be stronger than one pound to a quart of water, otherwise it is likely to give trouble. Those who wish to work in comfort should make up large quantities of the solution to the strength indicated, and never use it twice. The use of acids before fixing is also very bad, particularly with thick films, as the film is apt to be eaten away in patches in a very curious manner. I think also that acid fixing baths are bad. If you want good colour in your negative, use plenty of sulphite in the developer. The admirable paper read by Mr. Chapman Jones at the Society of Arts should be in the hands of every one. He shows conclusively that though the colour of the negative can be altered by acids after fixing, yet the stain in the clear portion of the negative is fixed as an insoluble compound in the film. I would recommend every one to get these papers, which they will find very instructive upon this point. If anything, the hypo bath should be slightly alkaline rather than acid, the colour of the negative being arranged by the proportion of sulphite of soda in the developer.

JAMES CADETT.

TONING PLATINUM PRINTS.

[Photographic Club.]

UNTIL quite recently, prints in platinum were looked upon as quite unalterable by subsequent treatment; but, during the past year, attention has been called to methods of toning or intensification with silver, gold, and a compound containing uranium.

It is a method of toning with gold that I am about to demonstrate. This treatment is applicable to most silver-printing processes. The prints are bleached, to some extent, during toning, but the strength is restored by the developer; the tones obtained, however, are not, as a rule, very pleasing. This method was arrived at after a series of experiments, which I will briefly describe.

The first point to establish was whether the platinum image had

any attraction for nascent gold. To ascertain this, platinum prints were placed in the ordinary gold toning baths used for silver prints, made up of weak solutions of gold chloride, and containing borax, sodium acetate, or ammonium sulphocyanide. In such baths the gold is in the form of a more or less unstable compound, and in the course of time the metal is set free. The presence of the platinum prints did not seem to hasten very much the deposition of gold, but in the course of many hours the prints appeared to be slightly intensified. The experiment was thus, so far, hopeful, as there appeared to be a slight attraction for the gold; but this method has no practical value, owing to the length of time required. Besides, the prints are badly stained all over.

In order to hasten the reduction, I tried feeble reducing agents such as sulphites, oxalates, organic acids, and various developing agents in neutral and acid solutions. In all cases gold was deposited rapidly, but it fell almost impartially all over the surface of the print and did not appear to be specially attracted to the platinum image or to have any great power of adhering to it.

Upon trying organic reducing agents of a glutinous nature much more promising results were obtained out of gum, glycerine, sugar, treacle, and glucose; glycerine answered best. Glycerine alone has a very feeble reducing action upon gold chloride, but, when in contact with a platinum print, the attraction of the platinum for the nascent gold assists the action, and the deposition commences in a few minutes. Gold deposited under these conditions adheres closely to the platinum.

As soon as the toning commences, the prints begin to take a slightly bluer colour in addition to an increase of strength. If the original image is brownish in tint, the toning will turn it first pure black, then blue-black, and finally almost blue. Owing to the colour becoming eventually unpleasantly blue, this process is not suited for the intensification of very weak prints.

There is very little tendency for the gold to be deposited upon the plain paper where no platinum at all is present unless the action be carried to an extreme extent, but a slight deposit of platinum previously invisible may be intensified and become evident.

At first I simply washed the prints in water after toning, but I found later that this was not sufficient, as they were apt to take a slight pink tinge in the whites after keeping some time. This I attribute to a tendency on the part of the gold to form some sort of compound with the size of the paper. What is required is to ensure the complete reduction of any gold compounds present. A simple way of doing this is to treat the prints with an alkaline developer. None of the prints so treated have shown any sign of change.

Working details:—

Solution 1.

Gold chloride	15 grains.
Water	7½ drachms.

Neutralised with chalk before use.

Solution 2.

Glycerine.

Solution 3.—*Developer.*

(*a*) Sodium sulphite		1 ounce.
Water	to	10 ounces.
Metol		50 grains.
(*b*) Potassium carbonate		½ ounce.
Water	to	10 ounces.

Mix equal parts (*a*) and (*b*).

Method of Working.

The platinotype print—developed, cleared, and dried in the usual way—is soaked for a minute or two in warm water, then laid upon a flat surface, preferably a sheet of opal glass, also warmed, and the print is well blotted to remove the excess of water. Next glycerine is gently spread over the whole surface of the print with a soft brush or the finger tip. When evenly coated, a few minims of the gold solution are dropped on, and rapidly mixed with the glycerine with a soft brush. Very soon the print will begin to gain in strength, and assume the blue-black colour. During the whole time toning is proceeding, the print should be brushed lightly and quickly to ensure even action, and to constantly bring fresh gold chloride into contact with the platinum; the brushing also lessens the tendency for the gold to be deposited on the high lights. The high lights should be watched, and, as long as they remain clear, the action may be allowed to continue. When the desired effect is obtained, the print should be quickly rinsed to remove the adhering glycerine and gold, and then sponged back and front with the metol developer. After this they will require washing for about twenty minutes.

Prints may be kept for some weeks or months before toning, but very old prints will not readily tone. The sepia paper will not tone satisfactorily. Prints are best toned in good daylight, as it is easier to judge of the colour obtained, and also the action of daylight seems to hasten the deposit.

This method of treatment has the following uses:—

1. To strengthen slightly under-exposed prints.
2. To convert a rusty or brownish tint into a pure black.
3. To produce blue-black prints when this variation of tint is considered desirable.
4. To enable brighter prints to be obtained from flat negatives than is usually possible by the ordinary method.

Alfred W. Dollond.

PLATINOTYPE BLACK TO SEPIA AND VANDYKE.

Satisfactory and successful as is the paper which we have learned to designate as platinotype in the hands of those who—like Mr. Frederick Hollyer—regularly cater for the more refined patrons of photography by prints produced by the before-mentioned process, there have always been some more or less minor objections to the full and free use of this, our highest class of printing procedure.

Chief amongst the aforesaid objections is—both in the judgment of the photographer and in the eyes of a large proportion of the public at large—the cold, dull, flat tone which to a larger or smaller extent characterises many prints produced by the black platinotype papers. Less cold, to be sure, than the ordinary bromide, and certainly much softer and truer in gradation, the black platinotype has always been prone to suffer by comparison with the attractive warmth of tone which lends such a charm to the albumen or gelatine silver and to the brown carbon prints.

Of course, there is available the process known as the sepia platinotype. Without going into the secrets of the printing room, enough, on this occasion, to say that photographers have reasons of their own for not extensively using this last make of platinotype paper; it is true that a certain proportion of our "superfines" avail themselves of it, for exhibition and medal-winning purposes, but they do so with considerable regret at having to relinquish the sweet certainty of the black paper for the sometimes exasperating vagaries of the brown.

All workers will therefore hail with pleasure the following means whereby the ordinary black-toned platinotype can be with much certainty and simplicity of treatment turned into a sepia, or Vandyke-coloured one. The procedure is supremely easy.

To each pint of water at 140° Fahr., add thirty minims of a stock solution of catechu powder, consisting of a quarter ounce mixed with six ounces water; or, if it is desired to keep the stock solution for more than a few weeks, then use five ounces water, and after solution add one ounce alcohol. The stock solution is made by boiling the compound catechu powder in a glass or earthenware receptacle for three or four minutes.

Having a bath mixed as directed in a clean porcelain dish, it is needful that the bath be kept at a temperature of from 130° Fahr. to 140° Fahr., for which purpose it is convenient to stand the porcelain dish in some tin or iron dish, or tray, which may contain water, or sand and water, and which is heated by being stood over a spirit or oil lamp, or over a small Bunsen or similar gas heater. The bulb of a thermometer (the latter preferably one consisting of a glass rod enclosing a scale on which are marked the degrees) should be allowed to rest in the solution, whereby one can see that the temperature is as it should be.

The bath being at 140°, immerse the print (a dry one is best); in about one minute a change should be perceptible, and in from three to ten minutes, according to circumstances connected with the way in which the print has been previously treated, and dependent upon the taste of the photographer, the toning is complete. The print is then slightly rinsed in two changes of water, dried and mounted.

Either before—or after—mounting, the print is considerably improved in general brilliancy, in the transparency of its shadows, and in the colour of the whole, by gently polishing it with a soft cloth, and a little neutral oleate of sodium; a piece of the latter, the size of a pea, being enough for a half-plate. Those who consider trouble more valuable than time may, instead of employing the above heating arrangement, use the bath at ordinary temperature, say 60° Fahr., in which case all that is needful is to immerse the print in the solution (thirty minims of stock solution to each pint of water) and turn it every hour or so until the desired tone is attained.

The time taken may be from three to eight hours, under normal conditions.

The process above described in brief, as I have personally tested it, is that known as Packham's process of treating platinotype prints, and, as far as my own experience goes, it appears to be one whose manipulation is ridiculously easy; furthermore, the results are more certain than with most other procedures which the photographer has to master. Working with the hot bath, I, with complete success, changed a somewhat weak and wishy-washy cold platinotype print into one which showed a pleasant, dark Vandyke warmth of tone, and in which the shadows seemed to have gained much-needed strength and luminosity.

In one respect, the above application of catechu seems similar to the Weir-Brown uranium toning bath for bromides, in that it exercises an intensifying, or rather fortifying, effect upon prints treated.

Hence in Mr. Packham's process will be found an invaluable aid to those—and there are, I fear, many such—who, through various reasons, have on their hands a stock of platinotypes which lack pluck or vigour; to all these I say, Get some of this catechu, and turn your comparative failures into comparative successes.

Another, and this too a very valuable, point is that the process is said to work better *when the original platinotype print is made on stale paper* (cold bath, black platinotype); indeed, Mr. Packham recommends that, before printing, the paper should be taken out of its calcium tube, and allowed to lie in a dark cupboard for a day or two. If this be not done before printing, let it be done, says he, before development. In my own case, I did not adopt either expedient; in fact, the prints I experimented on were some developed in March, 1893, and had been put aside as not good enough for the album or mount. To those who propose giving this discovery a trial let me add that the best result is obtained by using a particular blend of various species of catechu, of which there are some four or five varieties, having certain distinctive characters; some kinds, used alone, are of no practical value in the above-described process. At present it would be best for experimenters to apply to Mr. James Packham, of 17, Katharine-street, Croydon, who is the patentee, and who will either send applicants samples free, or do so on payment of a nominal charge, pending arrangements now being made for the commercial supply of the materials.

Before conclusion, a few words as to variation in tone at photographer's command. Where the platinotype print has been originally developed in a bath *very slightly* acidulated with oxalic acid, cold or yellow tones are produced by after-treatment with catechu. On the other hand, where the developer has been alkaline, a much warmer tone ensues than if it had been neutral.

Somewhat akin to the effect of a developer upon partly printed gelatino-chlorides, which are developed before toning, the catechu renders visible light action, which the oxalate bath does not bring out; hence care must be taken that the paper does not, before development in the oxalate, become affected by careless handling. Another caution is that water free from lime should, if possible be used, otherwise it will be found advisable to add about a grain to the pint of oxalate of potash, or of neutral oleate of sodium, without which the solution is liable to turn pale pink, and to *slightly* tint the high lights. The addition of the foregoing produces a warmer tone than would otherwise ensue.

As regards permanency, I have seen prints when first toned, over twelve months ago, and inspected them at short intervals since, without being able to notice any loss of vigour or change of colour. They are hung in an ordinary dwelling-room, and receive an hour or two's sunshine each day that the luminary is in the mood.

How far the process is likely to be fashionable is evidenced by the fact that, amongst others, Messrs. Ralph W. Robinson and B. Gay Wilkinson are sufficiently enamoured with the results to prepare prints of their pictures by its means. Certainly the most attractive rendition of Mr. R. W. Robinson's *Loves me, loves me not*, is one I have seen toned by means of Mr. Packham's delightful process. Besides its applicability to the ordinary cold-bath prints, it may be used for the hot bath (both black or sepia paper); also for Pizzighelli and Hardcastle brands of print-out platinum papers. The new platinum paper brought out by the Autotype Company is also very amenable. Some portraits, and also some interiors, shown as examples of what can be effected by Mr. Packham with this paper, struck me as being most conclusive evidence of the great value and surprising beauty of this singular application of an organic tincture to the colouration of the inorganic platinum image.

HECTOR MACLEAN.

CONCERNING THE LICK TELESCOPE.

J. NORMAN LOCKYER, in course of a lecture on the sun's place in nature, published in *Nature* of the 21st ult, says: "Let me bring before you one of the most perfect pieces of workmanship in the world, constructed to investigate the phenomena of the heavens. It is a photograph of the Lick Observatory, situated at an elevation of 4000 feet on Mount Hamilton. Mr. Lick, the founder, was a very ambitious man. He was, I believe, an hôtel-keeper at San Francisco; but, however that may be, he has made his name immortal by helping on the progress of mankind. I wish we had some hotels like the San Francisco hotel in this country, and some Mr. Licks, because then some Englishman might immortalise himself in the same way. This, then, is the magnificent locality in which a great deal of the work that I shall have to refer to has been done. The principal instrument of this great Observatory is a refracting telescope, having an object-glass three feet in diameter, and a tube fifty-four feet in length. This is practically the most important telescope in the world at the present moment, and, to give you an idea of the wonderfully broad way in which the authorities have gone to work, I need only state the following fact: Some of you who have been in an observatory may remember that it has sometimes been very difficult to get the observatory chair at the right height, or in the right position, for observing a star or any celestial body with any comfort. The Americans get over this by simply raising the floor. By means of hydraulics the enormous floor, some eighty feet in diameter, is moved up and down with the chair. The importance of spectroscopic work has not been lost sight of in the equipment of the Observatory, and a very powerful spectroscope can be used in conjunction with the great equatorial for observing or photographing the spectra of the various celestial bodies."

Our Editorial Table.

LANTERN SLIDES: THEIR PRODUCTION AND USE.

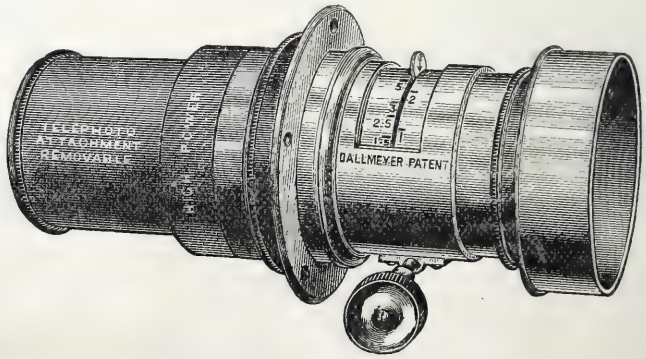
By J. PIKE.

IN this little treatise (published by Percy Lund & Co.) Mr. Pike urges the importance of employing well and carefully lighted negatives as the prime factor in the production of high-class lantern slides, and gives hints as to the preparation of the negative for this purpose. He then describes the methods of making transparencies, dwelling at some length upon that by means of carbon, which is less appreciated and less known than it ought to be. The booklet is practical, and comprises many hints useful to the uninitiated. Price 6*d*.

NEW CATALOGUE OF PHOTOGRAPHIC LENSES.

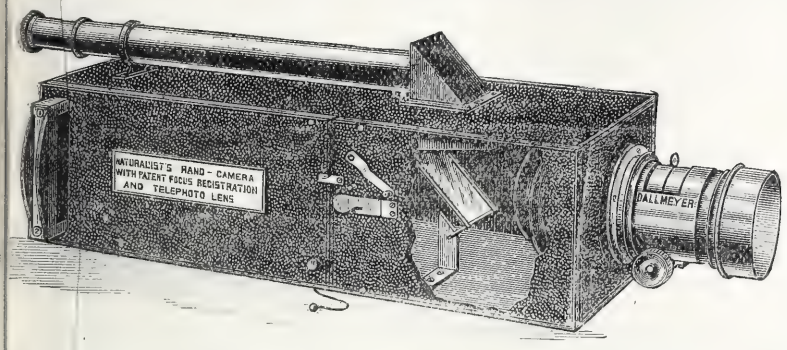
J. H. Dallmeyer, Limited.

IN this new catalogue are comprised all the previous productions of this eminent firm, together with their new additions to the already existing series. We observe that there is a general revision of prices, consequent upon increased facilities of production; also that special reduction in prices of aluminium mounts has been made. It contains complete information with regard to tele-photographic lenses, including hints as to their practical working and concise data. Much useful information relating to the care of lenses, their selection for special purposes, and their properties in general, will be found distributed throughout the pages. As most of the Dallmeyer lenses are, in externals, very much like those by other makers, we confine our illustrations, culled from those in the catalogue, to such as will prove interesting and instructive at sight. The first of these is the



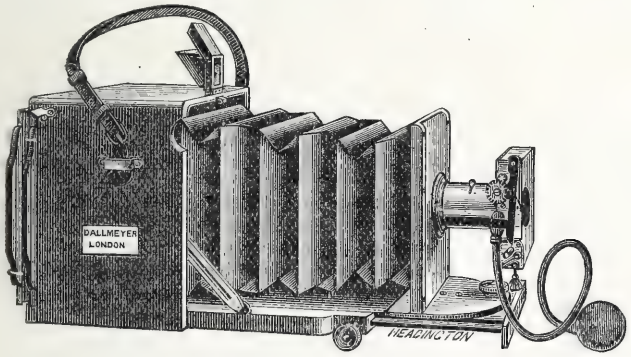
high-power tele-photo lens, the smaller end carrying a cell containing a negative combination.

Dallmeyer's recently introduced Naturalist's Hand Camera, and which, in our estimation, is a most useful instrument, is shown in the following drawing:—



In the front is the lens, and on the top is seen a species of focussing telescope, in which the eye observes the image formed by the lens, reflected in a line parallel to its axis by means of the reflectors shown. When everything is seen in accurate focus, the trigger is touched by which the lower reflector is thrown out of the way and the image impressed upon the sensitive plate.

The new Portable Folding Camera, shown in the adjoining cut, explains itself. As will be perceived, it is suitable for short or long-focus lenses.



News and Notes.

On Tursday evening, March 7, the South London Photographic Society will hold their first *conversazione* at the Public Baths, Church-street, Camberwell, S.E.

Mr. W. Brooks has been unanimously elected a Vice-President of the Royal Cornwall Polytechnic Institution, in consideration of the services he has rendered the Society during past years.

Mr. J. Epstein, of 33, Broad-street, Bristol, has been awarded a silver medal at the Yorkshire Trades and Industrial Exhibition, Artillery Drill-hall, Sheffield, for his show of picture-frame mouldings and mounts. This makes three awards within the last twelve months.

Method of Fixing Pencil or Crayon Work on Bromide Prints.—If the following is not known or practised, I think that its publication will be of use to those who desire to finish bromide prints or enlargements with pencil or crayon, instead of with Indian ink and gum. The prints having been worked on, fixing is effected by a jet of steam being carefully directed against its surface. The upper surface of gelatine is softened a little under the action of the steam, and the powders are amalgamated with it. It is necessary to watch the operation very carefully, and not allow the action of the steam to be too great. Prints thus prepared resemble crayon or pastel work, and the results are most admirable, even with originals which, before being worked on, are very inferior. I obtain the steam jet very simply; a small kettle with a piece of rubber tube on the spout is all the apparatus necessary. This is partly filled with water, not higher than the lower end of the spout, and put on a gas stove, or kept boiling by any other means. The rubber tube, with a suitable metal nipple to control the steam jet, is then directed against the print, at a distance which experience may dictate.—*Photographic Scraps.*

A Photographic Society for Newton Heath and District.—Early in January a number of amateur photographers met in the Wesleyan School, Newton Heath, and, after some preliminary conversation, decided to form a Society for Newton Heath. The meeting at once proceeded to elect a committee and officers, with the following result:—*President:* Mr. W. T. Evans. —*Treasurer:* Mr. J. Moody.—*Secretary:* Mr. J. Fortune, Oldham-road, Newton Heath. It was decided that the name of the Society should be "The Newton Heath Camera Club." On Friday evening, February 15, the inaugural conversazione in connexion with the Society was held, when about eighty persons, more or less identified with the photographic art, were present. The President delivered an address on the pleasures and uses of photography. Mr. Albert Andrew gave an amusing reading on the *Blunders of a very Amateur Photographer.* The Secretary gave a brief account of the programme for the year, after which the meeting adjourned for refreshments and conversation. A lantern exhibition, illustrative of a tour through Switzerland, brought a pleasant and successful evening to a close. The Society already numbers upwards of thirty members.

Affiliation of Photographic Societies.—Meeting of Delegates held at 50, Great Russell-street, London, W.C., on February 15, 1895, Mr. E. Clifton (Chairman) presiding.—The minutes of the last meeting were read and confirmed. The Secretary stated that he had that day seen the Clerk to the Cordwainers' Company, and that arrangements were well in hand for the forthcoming lectures. The various suggestions that had been received in answer to the Chairman's circular were then considered, and the following resolutions were come to:—"That the Journal in future be sent to the secretaries or to the delegates, as decided by each Society." "That when an invitation to the Committee of Delegates to meet elsewhere than in London be received from any other town, the Committee would be pleased to consider the matter." "That the Secretary be instructed to communicate with the Secretaries of affiliated Societies, with a view to the interchange of lecturers, &c., and that a meeting of the Secretaries be thereafter arranged." "That a list of the privileges to which members of affiliated Societies are entitled be printed and circulated, together with an annual list of affiliated Societies, with place, date, and hour of meeting, and name and address of Secretary." The question of the journal which forms the organ of the Affiliation was then taken into consideration, and, after some discussion, the whole question was referred to the Chairman and Secretary to report. It was agreed that a representation be made to the Council of the Royal Photographic Society to inquire if they could not see their way to the circulation of a selection of pictures at the Pall Mall Exhibition every year amongst the affiliated Societies. It was also agreed that the rules as settled by the last Conference of Judges be printed and published.

Novel Methods in Photometry.—The determination of the times of exposure of a photographic plate which are required to produce the same density of film when exposed to different light sources forms the basis of the methods recently adopted by Dr. Janssen for investigating the brightnesses of the heavenly bodies (*Bull. Mens. Soc. Ast. de France*, February). In the case of stars, the plate is placed a little within the principal focus of a telescope, so that a disc, or "stellar circle," replaces the almost point-like image ordinarily obtained; a series of exposures is made on one star, and another series on the star to be compared with it; the two images of the same density are thus identified, and the photographic brightnesses of the two stars are inversely as the durations of the corresponding exposures. To compare the light of a star with the sun, an opaque screen, pierced with holes of the same size as the stellar circles, is placed in front of the photographic plate, and these holes admit sunlight to the plate at the moment a triangular aperture in another metal plate is passed over them on releasing a spring; in this way a series of circles of increasing intensity is impressed on the plate, and can be compared directly with the stellar circles. In its application to nebulæ, Dr. Janssen's method promises to be of great value. On the same plate which has been exposed to a nebula, a series of "stellar circles" is formed by directing the instrument to a star in the neighbourhood which shows no signs of variability. In the future, when one wishes to obtain a photograph of the nebula which will be strictly comparable to one taken previously, it will only be necessary by means of stellar circles to determine the exact exposure which should be given. From an inquiry into the photographic luminosity of the tail of comet *b*, 1881, Dr. Janssen finds that the intensity decreased in a ratio between the fourth and sixth power of the distance from the nucleus.—*Nature.*

Imperial Institute.—The second of the series of lectures to be given in connexion with the forthcoming Special Exhibition of Photography at the Imperial Institute was delivered last week. It was entitled *Photography as applied to the Production and Reproduction of Pictures.* Mr. George Davison, the lecturer, gave an illustrated description of the part played by photography in the processes of line and half-tone relief blocks for general pictures, and deprecated the multiplication of inferior photographs in certain illustrated periodicals. The principles involved in the use of the ruled line screens in half-tone work were discussed and illustrated, and the half-tone process compared with wood-engraving. Recent advances in orthochromatic photography were referred to with comparative examples, and some three-colour photographic prints, prepared as lantern slides and sent from America by Mr. Fred. Ives, were exhibited. All the leading reproduction processes were treated of, the lecturer holding photogravure to be the best method extant for artistic reproduction in black and white. The latter part of the lecture was devoted to an argument in defence of the direct use of photography by artists for pictorial purposes. Examples of portraiture, landscape, and *genre* work, by Colonel Gale, Messrs. Hollyer, Robinson, Wellington, and others, being exhibited as lantern illustrations, the proceedings concluded with the customary vote of thanks to the lecturer, on the motion of Sir Henry Trueman Wood, who occupied the chair.

The third of the series of lectures introductory of the Special Exhibition of Photography to be held during the forthcoming summer at the Imperial Institute, was delivered on Monday, February 25, at 8.30 p.m., by Captain E H Hills, R.E., F.R.A.S., who chose for his subject *Photography as applied to Astronomy.* The Astronomer Royal was in the chair at the lecture, and at the "House" dinner which preceded it. Captain Hill's lecture was of a very interesting nature, and was illustrated by lantern views shown through two lanterns. It included statements proving that the modern science of astronomy was very largely due to photographic methods. In fact, some astronomers thought the photographic plate was destined to supersede eye observation altogether. He pointed out that, without going so far as this, photography

offered three distinct advantages: (1) the accuracy with which measurements could be made on the photographic plate; (2) that a photograph was a permanent record available for reference at any future time; and (3) that the sensitive film would detect objects which could not be seen by the eye, such as the invisible portions of the spectrum, and stars whose light was so faint that no telescope could directly reveal their presence to the eye. An explanation was given of the instruments used for astronomical photography, the first class being reflectors, with which the light was concentrated by reflection from a concave mirror, and the second class refractors, with which the light was concentrated by refraction through a lens. The reflector, it was said, offered the great advantage that all rays, whatever their colour, were brought to the same focus, while the refractor was easier to adjust, and was preferable where photographs taken with different instruments had to be compared. Captain Hills gave a short history of astronomical photography, in which he pointed out that Bond, of Harvard, in 1841 took photographs of the moon with a Daguerreotype plate. On the invention of the collodion process, several observers took up the work, the moon being successfully photographed by De la Rue, Rutherfurd, and others, and the sun by Secchi. The limitations of the collodion plate were, however, soon reached, inasmuch as only a comparatively short exposure could be given, on account of the plate drying, and so becoming insensitive. Sir J. Herschell gave it as his deliberate opinion that photography would never be used for astronomical research. But the invention of the gelatine dry plate opened a new era. Any length of exposure could now be given, and the sensitiveness of the plate was much increased. Examples of modern photographs of the moon, taken at the Lick Observatory, were shown. The crucial question was whether details on the moon's surface could be seen in the photograph which could not be seen by the eye. Recent experiments in Paris seemed to give an affirmative answer to this question. For this work a large primary image was necessary, as it was not possible to magnify a photograph more than a certain extent, or the grain of the sensitive silver salt would obscure the details. Photographs of the sun were taken every day at Greenwich, as a record of the state of the solar surface. Sunspots had been very successfully photographed by Janssen. Attempts at photographing planets had, however, met with no very great success. Good photographs of Jupiter and Saturn had been taken at the Lick Observatory. Photographs of nebulæ had resulted in a great increase of our knowledge of these beautiful objects. This was especially true of Dr. Common's photographs of the Orion nebula, and those taken by Mr. Isaac Roberts of the nebula in Andromeda. The work on the international photographic star-chart, as arranged at the Paris Conference in 1887, was now being vigorously carried out. The best method of measuring the plates and the limit of accuracy were as yet uncertain. Photography was specially applicable to eclipse work, the shortness of the duration of a total solar eclipse rendering the making of useful drawings quite impossible. All drawings of the corona were unreliable. Beautiful photographs of the solar prominences and faculæ had been recently taken by M. Deslandres, of Paris. Photography was also applied to the measurement of the velocity of stars in the line of sight, and to the detection of double stars, that could never be seen as such by any conceivable telescope. The Chairman having proposed a vote of thanks, which was passed by acclamation, the proceedings terminated.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 3527.—"An Adjustable combined Sky-shade and Self-capping Safety-flap for Photographic Shutter." E. Winter and H. Levy.—*Dated February*, 1895.

No. 3613.—"Improvements in Colour Photographs and Apparatus for Producing and Viewing the Same." B. J. Edwards.—*Dated February*, 1895.

No. 3634.—"Improvements in Photographic Cameras." Complete Specification. H. J. Spratt, A. S. Spratt, and G. A. Spratt. *Dated February*, 1895.

No. 3784.—"Improvements in Photo-chromoscopes and Photo-chromoscope Cameras." F. E. Ives.—*Dated February*, 1895.

No. 3796. "Improvements in Photographic Shutters." H. Hill and A. L. Adams.—*Dated February*, 1895.

PATENTS COMPLETED.

Improvements in Photographic Change Boxes for Flexible Films.

No. 5095. William Wallace Beasley, Claremont House, Soho Park, Handsworth, Staffordshire.—*January* 12, 1895.

This invention consists in the herein-described improvements in photographic change boxes for flexible films, by means of which a number of cut sensitised films suitably backed, or of films and backings disposed alternately, are caused to be transferred from front to back of the change box, or *vice versâ*, in the following manner:—

The films are kept pressed forward in the change box by means of a spring or springs. The first film, or backing, as the case may be, upon being raised by a lifting arrangement, mechanism for which is hereafter described, is drawn up and out of the way of the succeeding film, and left in such a position as to be partly transferred or carried over to the back, the film being bent over in so doing.

The second film, or backing, is then raised, the upper edge of which comes in contact with the lower edge of the bent and partly discharged film, and thus pushes it completely over into its place in the back of the change box; and so on with the rest of the films in the box, each film or backing being pushed over by its successor.

The interior of the top and back of the change box is of such a curved or inclined form as to guide the film in its passage over to the back, and also to keep the edges of the two films in contact during their passage, and should preferably be lined with a band of plush, velvet, or other soft material, which may be wholly or partly attached.

A suitable roof or top piece is also provided to keep the films in position in the change box, and may be so gauged with respect to the front as to prevent more than one film passing at a time.

The mechanism for raising may consist of two flat metal rods, each travelling up and down its respective side of the box. Each metal rod is provided near to its lower extremity with a tooth or projection for drawing up the film when the lifting arrangement is raised, the upper ends of the said rods being connected together outside the box by a suitable crossbar or connecting piece.

Improvements in Frames suitable for Photographs and the like.

No. 13,088. William Middlemiss, Nesfield-street, Bradford, Yorkshire *January* 12, 1895.

This invention relates to certain improvements in photographic and like frames, and has for its object the construction of same in such a manner that photographs and the like may be placed therein or removed with greater facility than is the case with frames of the ordinary description, and at the same time to exclude dust from entering the frame and damaging the contents thereof.

I accomplish my object in the following manner: The photograph or the like is placed along with the glass into the frame, and secured therein at the top by means of a movable "slip" or "rebate," and at the bottom by a fixed "rebate." The movable "slip" or "rebate" extends through the frame at each side, and is provided with suitable attachments for the purpose of retaining such "slip" in either the "up" or "down" position, and, upon raising the "slip" clear of the glass, the photograph or the like is liberated, and moved forward by means of a spring, or the like secured in the frame in any convenient manner, and to such an extent that the contents of the frame may be easily removed and others replaced at will.

The glass and contents are prevented from being entirely forced out of the frame by means of studs or the like placed at or near the bottom; such studs may be covered with indiarubber or other flexible material, to prevent the liability of the glass becoming damaged.

Improvements in Tension Spools, applicable for Use in Photographic Cameras and for other purposes.

No. 23,524. Theodore Minot Clark, 1, Mount Vernon-terrace, Newton, County of Middlesex, and State of Massachusetts, United States of America. —*January* 12, 1895.

The object of this invention is to provide an improved construction of spool, bobbin, or reel, with provision for placing a tension on the commodity carried by it, and maintaining a stretch of the same always taut by a tendency to rewind it. The invention is capable of embodiment in many different forms for many different uses. It is here shown in a form adapted for holding the sensitive film commonly used in cameras, and the invention may be said to be particularly useful in this connexion, as it provides for keeping the stretch of film extending across the camera perfectly smooth, and at the same time no tension device bears against the film, and it is not in any way impaired.

The accompanying drawings, forming part of this specification, illustrate an embodiment of the invention.

Figure 1 shows the complete spool in side elevation.

Figure 2 shows a longitudinal section of the same.

Figure 3 shows a central cross section.

Figure 4 shows the spindle and spring in side elevation, without the casing.

Figure 5 shows the same in end elevation. [Drawings accompany the specification.]

The normal compass of the springs is such as to require their compression to a certain extent in order to insert them in the cylinder, and hence they will press against the interior surface of the cylinder.

Unwinding the film or whatever else may be wound upon the spool is resisted by the springs, so that when the device is in use these springs constantly tend to turn the spool back and wind up the film by reason of their torsional action. Hence a stretch of the film drawn off from the spool will always be kept taut.

The frictional engagement of the spring with the walls of the cylinder caused by its expansive tendency, is sufficient to produce a torsional strain on the spring when the cylinder is turned, and a tendency of the spring to rewind the film.

In filling the spool, it will be supported so that the spindle and cylinder may turn together, and the spring will not offer any resistance.

The heads of the cylinder may be provided with holes to receive the forked ends of suitable trunnions or other supports, which may be used to hold the spool while it is being filled.

When the cylinder is made of sheet metal, it will be covered with paper, to which the film can be conveniently attached.

It will be observed that the heads extend beyond the cylinder to form confining flanges for the film.

While the device is of special utility for holding films in cameras, it can also be advantageously employed for other purposes, as for holding yarn or the like.

While I prefer to use two springs, as shown, secured at their inner ends to the spindle so as to cause a uniform action throughout the length of the spool, yet it is obvious that a single spring could be used to accomplish the purpose.

It is also preferable to taper the springs as shown, so that the several convolutions successively release their hold on the cylinder.

The claim is in a tension spool, comprising a cylindrical shell, having heads with circular holes through their centres, a spindle extending through the cylinder and fitting said holes, leaving the cylinder free to rotate on said spindle, and a spiral retracting spring or springs fastened to said spindle and surrounding the same and extending longitudinally within the cylinder in frictional engagement with the walls thereof.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
4	A. A. Camera Club	*Vaulting.* Arnold Mitchell, F.R.I.B.A.
4	Camera Club	
4	Liverpool Park	*Finishing in Black and White.* Mrs. A. E. Cassell.
4	Midland	Prize Slides.
4	North Middlesex	Informal Meeting.
4	Peterborough	
4	Putney	
4	Richmond	Lantern Evening.
4	South London	Adjourned Competition of Lantern Slides from Negatives taken at the Excursions in 1894.
4	Stereoscopic Club	
5	Birmingham Photo. Society	
5	Bolton Photo. Society	
5	Brixton and Clapham	Lantern Evening.
5	Exeter	
5	Gospel Oak	*Portrait Photography and Posing.* W. E. Debenham.
5	Hackney	Open Night.
5	Halifax Camera Club	Lantern Night. J. E. Jones.
5	Herefordshire	
5	Keighley and District	
5	Lewes	
5	Munster	*The Art Side of Photography.* The President.—Members' Lantern Slides.
5	North London	
5	Oxford Photo. Society	
5	Paisley	
5	Rotherham	
5	Sheffield Photo. Society	
5	York	
6	Croydon Camera Club	Photographic Chat.
6	Edinburgh Photo. Society	
6	Leytonstone	
6	Photographic Club	
6	Southport	
6	Southsea	
7	Birmingham Photo. Society	
7	Camera Club	
7	Dundee and East of Scotland	
7	Ealing	Lantern Entertainment. E. J. Wall.
7	Glasgow Photo. Association	
7	Glossop Dale	
7	Hull	
7	Leeds Photo. Society	Annual Lantern Exhibition.
7	Liverpool Amateur	*Picture-making by Photography.* Mr. Anyon.
7	London and Provincial	*The Construction and Sanitation of Studios and Dark Rooms, as affected by the Building Acts.* G. D. Sargeant.
7	Oldham	
7	Tunbridge Wells	
7	West London	Demonstration: *Partial Development of Prints.*
8	Bristol and West of England	
8	Cardiff	
8	Croydon Microscopical	
8	Holborn	
8	Ireland	*Wanderings thro' Shakespeare's Country.* J. R. Simpson.
8	Maidstone	
9	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

FEBRUARY 26,—Technical Meeting, Mr. J. Spiller (Vice-President) in the chair.

The HON. SECRETARY stated that the Council at their meeting that evening had appointed the following officers:—*Hon. Solicitor*, Mr. F. Ince.—*Hon. Librarian*, Mr. E. Clifton.—*Hon. Secretary*, Mr. Chapman Jones. To fill two vacancies thus caused on the Council, Major Lysaght and Mr. F. A. Bridge were elected.

Mr. J. FUERST showed the negatives and prints which had taken the first prize in the recent competition in orthochromatic photography promoted by his firm. Lantern slides of comparative results on ordinary and panchromatic plates (Lumière's) were also shown. The orthochromatic results were much admired.

Mr. A. W. Dollond showed platinum prints with a greenish tone produced by a modification of his own process of toning with gold. The variation in tone was produced by treatment of the print, after the gold and glycerine, with potassium chloro-platinite. Answering a question as to the permanency of these results, he said that theoretically their permanency was not open to suspicion; he had had some for eighteen months and they were unchanged.

Mr. J. W. GIFFORD read a paper on *The Correct Rendering of Colours in Black and White.* He described and illustrated a large number of experiments in photographing the spectrum and coloured pictures. He stated that his best results were obtained by using a commercial bromo-iodide plate sensitised with a mixture of cyanine and phosphine, washed, then immersed in an alkaline solution, washed and dried. Such plates he had found kept a fortnight. For a screen, he preferred one of aurine and picric acid, placed in the diaphragm slot of the lens.

We hope to reproduce Mr. Gifford's valuable paper *in extenso* on a future occasion.

A short discussion followed, in which Mr. Wall and Mr. Lovibond took part, and a vote of thanks was passed to Mr. Gifford.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 21, Mr. W. E. Debenham in the chair.

Mr. JAMES CADETT read a paper on *Development and Fixing*, showing by means of the lantern slides illustrating density curves, obtained by the Hurter & Driffield system of measurement, in illustration of points in the paper.

A discussion followed.

Mr. J. E. HODD asked Mr. Cadett whether the appearance of the image through the backs of the plates did not vary during development, with the particular emulsion.

Mr. CADETT replied that before fixing one could generally see if the image had gone right through. Some forms of silver bromide were undoubtedly more transparent than others.

Mr. P. EVERITT said that supposing two plates to have had identical exposures, and one developed for a sufficient time with a weak developer and a small amount of bromide so that the highest light was carried right through the film, and the other plate developed with a higher amount of bromide until as much was got out of it as in the other case, ought not the two negatives to give the same gradation? It seemed to him that it should be so.

Mr. CADETT replied that the opacity would vary with the same amount of bromide. A different character of negative altogether was obtained by the addition of bromide, namely, an increased deposit of the high lights and a lessening of the shadows.

Mr. W. H. BARNES, in commenting upon Messrs. Hurter & Driffield's original contention that the only means of varying gradation was by the exposure, said he was pleased to hear a renunciation of the statement. The former contention was distinctly against the experience of practical photographers. Referring to the effects of bromide, he said the maximum of difference was got by the use of a strong developer. In the matter of getting out detail with various developers, he also said there was a difference in the behaviour of some of them, pyro having to be used weak and eikonogen strong.

Mr. CADETT observed that Dr. Hurter was studying the influence of fog on speed. Enormous differences of speed could be obtained with the fog not interfering.

The CHAIRMAN asked if Messrs. Hurter & Driffield had renounced their original proposition?

Mr. CADETT said the publication of a standard developer was a practical admission that they were wrong.

Referring to various remarks in Mr. Cadett's paper, the CHAIRMAN thought that most photographers would be intelligent enough to so modify the developer if they intended to get out the last details before the negative would be too dense. He was never anxious about density, as he did not use a developer which would in the ordinary way give too great density. As regards the standard developer, he could not see how the purpose of it could be scientific. If that developer would not give the speed of plate which another developer would, it did not represent the speed of the particular plate. If it "fitted" one plate, it was unscientific to give that plate the same speed as another plate speeded with another developer.

Mr. BARNES asked if ferrous oxalate gave the maximum speed of any plate? His experience was to the contrary.

Mr. CADETT said there was one plate on the market with which ferrous oxalate gave its highest speed. Messrs. Hurter & Driffield used specially prepared slow plates in their original experiments, and with every developer tried had got the same speed. Of course, commercial plates varied with the maker. It was, however, impossible to upset their theory of the relation of density to speed.

After other remarks, a vote of thanks was passed to Mr. Cadett for his paper.

PHOTOGRAPHIC CLUB.

FEBRUARY 20,—Mr. A. Mackie in the chair.

Mr. J. E. Hodd and Mr. W. J. Ethridge were unanimously elected members of the Club.

Mr. A. W. Dollond read a paper on, and demonstrated his method of, toning platinotype prints (see page 134).

After remarks were made by several members in appreciation of the great value of Mr. Dollond's method, a unanimous vote of thanks was passed to the lecturer for his paper.

Mr. SINCLAIR read a paper from Mr. Watkins on *Control in Development* in answer to Mr. Edwards (see page 132).

Mr. FRY mentioned his experience in connexion with Mr. Watkins's method of exposure and development.

Mr. EDWARDS read some remarks and showed some examples.

Mr. COWAN substantially agreed with Mr. Watkins's remarks.

MANCHESTER PHOTOGRAPHIC SOCIETY.

FEBRUARY 14,—The President (Mr. H. M. Whitefield) in the chair.

Mr. ALFRED BROTHERS, F.R.A.S., gave an address on *Stellar Photography*, illustrating his remarks by the exhibition of many interesting lantern slides of celestial bodies, such as Jupiter, Saturn, Nebulæ, Orion, the Sun, and Moon, the latter being the first celestial object every photographed.

Mr. Brothers gave an account of his earlier work twenty-five years ago, and exhibited some interesting results, and remarked that, with the advent of the gelatine process, astronomical photography had become much simplified, and, owing to the great sensitiveness of the photographic film, many stars unseen by the aid of the most powerful telescope were, nevertheless, recorded by the photographic plate. Making use of this new power, the workers at the principal astronomical observatories throughout the world are at the present time engaged in securing a new map of the heavens.

As an instance of what could be accomplished by means of a cheap form of ens some beautiful views of the constellation of Orion, produced by Dr. Sheldon, of Macclesfield, by means of a common portrait combination one inch and five-eighths in diameter, were exhibited. The exposure given was one hour and ten minutes.

The PRESIDENT announced that the exhibition of members' work, usually held in the spring, would be postponed until the autumn, in order to give better opportunity for preparing the exhibits.

Hackney Photographic Society.—February 19, Mr. E. Puttock presiding.—In the course of the evening Mr. J. O. GRANT read a paper on *Animal Photography*, of which the following is a brief summary: He said that, to be successful in this branch of photography, one must be fond of the study of animal life; but this interest he thought to be common to every one to some extent. Touching briefly on that phase of animal photography which is confined to the portraiture of domestic animals, he said that, above all things, great patience was necessary, which, however, would apply to all branches of animal photography. Passing to a wider field of work, Mr. Grant said that the best place for study was the Zoo; but, let it not be thought one Club outing a year, or an occasional visit, would be much use if serious and good work were intended. On the contrary, it was necessary to practise often and alone, for the work required all one's attention, and this a companion would disturb. If one had time and opportunity, he would find the Zoo large and varied enough to last a lifetime. It was wonderful how many pictures one could make of the same animal, and not get tired of it. There was considerable scope for arrangement and composition in a picture of an animal in a cage. The rocks in the centre, or the wall at the back, should be used as backgrounds, and not the railings on the opposite side, if one could help it. The background should be put out of focus as much as possible so that the animal might stand sharp and clear against it. The bars of the cage should not be photographed in front of the animal, and care should also be taken not to photograph when the sun casts the shadows of the bars upon the subject, or it would appear to be striped. At the Zoo it was well to make friends with the keepers, as their assistance when photographing the larger caged animals was invaluable. Lions and tigers often wore a very sleepy look, which a call from the keeper would remove, temporarily, but long enough for the photograph to be made. After referring to the wide field for work in the country, in the farms, meadows, &c., Mr. Grant passed on to the consideration of apparatus. He said that no special appliances were necessary; what one had already would do very well. He had worked for a long time at first with a half-plate stand camera, and would still use it if it were a choice only between that and some forms of magazine hand cameras. However, he thought the best to use was a twin-lens hand camera with dark slides. He believed in working the shutter at the longest exposure the steadiness of the hand would allow. One-fifteenth of a second he generally worked at, with *f*·8. As regards plates, the use of isochromatic plates was desirable and necessary in many cases in order to get approximately correct colour values of some animals' skins. An animated discussion followed Mr. Grant's paper, the question being debated as to whether the tripod camera was as good as the hand camera for this work. It was generally conceded, however, that the hand camera was more convenient, and, in field work, not so likely to disturb the animals as the stand camera.

North Middlesex Photographic Society.—Monday, February 11.—The half-yearly Lantern Show was held at Jubilee Hall, when a large number of slides by the following members were passed through the lantern:—Messrs. Tilly, Barnard (who showed some very fine slides of Tintern Abbey and Norway), Smith (views of the Doone Valley), Avory, Taylor (some very fine slides of Jersey), Williams, and Mattocks. Amongst Mr. Williams's collection were some *genre* studies of a very humorous character, and which had an additional interest in the fact that the image was composed of soot. The members' slides were followed by a very interesting set by the Leeds Photographic Society, and which were greatly admired, those by Mr. Walker coming in for special recognition.

ON Monday, February 18, "Instruction Evening," Mr. S. E. WALL took in hand the subject of exposure. In the course of his remarks, which were listened to with great interest by young and old workers alike, Mr. Wall explained the use of nearly all the exposure meters and tables on the market. He also showed and explained shutters by Tylar, Thornton-Pickard, Robinson, Adams, &c., a vote of thanks to Mr. Wall bringing the meeting to a conclusion.

Putney Photographic Society.—February 21, Dr. W. J. Sheppard, Vice-President, in the chair.—Mr. W. J. RAMSAY, of the Eastman Company, gave a very instructive demonstration on *Nikko and Platino-bromide Papers*. Mr. Ramsay advocated the oxalate as the best developer for ordinary subjects, and second to that metol, while he considered the latter very suitable for portraits. Having developed some exposures with each developer, he afterwards showed some finished prints which were much admired.

Richmond Camera Club.—At the meeting on the 11th inst., Mr. Ennis in the chair, Mr. Robinson, of the Carlotype Company, gave a demonstration on *Mezzotype Paper*, for which he claimed that it gave effects closely resembling water-colour drawings in monochrome. The specimens shown bore out this contention, and also exemplified the great variety of tone obtainable. Several prints were toned with platinum, and it was pointed out that unsatisfactory results were, in most cases, due to over-toning.

ON the 18th inst., Mr. Cembrano presided, and Mr. E. J. Wall gave a "chat" on the subject of *Spectacle Lenses*, used either singly or in combination with other lenses, to modify the focal length of the latter. With the aid of a blackboard, he explained the action of a supplementary spectacle lens, and gave the formulæ for calculating the focal distance produced by the combination of lenses of given foci, showing how a few interchangeable spectacle lenses, used in combination with a rapid rectilinear, formed a cheap substitute for a costly battery of long and short focus lenses. Mr. Wall also stated that, with the aid of spectacle lenses and a bit of P.O.P. tube, he had constructed a telephoto combination with which he could get images of adequate size of distant parts of buildings which an ordinary long-focus lens would only render on a minute scale.

South London Photographic Society.—February 18, Mr. F. F. Buckle in the chair.—A demonstration of *Carbon Printing* was given by the Autotype Company. Pigment printing was described as one of the simplest of printing processes, and with it results could be obtained in any desired colour, and in any surface, either rough or smooth. Particular attention was drawn to the daylight tissue recently introduced, which is capable of being sensitised and dried for use in daylight. The exposure of the tissue and the use of actinometers were explained in detail, after which the demonstrators proceeded to develop a large number of prints and transparencies in various colours both by the single and double transfer processes. Specimen prints on the platinotype paper, prepared by and being placed on the market by the Autotype Company, were shown and much admired.

Woolwich Photographic Society.—January 20. Mr. H. H. Barker was elected to take the chair.—The meeting was an extra one, and was arranged for the purpose of giving the members, who think of obtaining hand cameras during the coming season, an opportunity of inspecting as many different types as could be got together. Some twenty members kindly came forward and explained the mechanism and working of the hand camera that each one possessed, and questions were also freely put concerning the advantages, or otherwise, of the particular pattern before the notice of members. In this way, many cameras of the best-known makers were shown, as well as several made by members. The show was supplemented by trade exhibits, which were kindly lent for the purposes of the meeting. J. F. Shew & Co. sent several of their well-known specialities, including the Featherweight, the Eclipse, and Ano, &c.; Messrs. Marion & Co. sent one of their Perse pattern; Messrs. Butcher & Co., the Primus and Tiny dark slide, and the Filmax Camera Manufacturing Company sent the Filmax. This busy and enjoyable evening was brought to a close with a hearty vote of thanks to the firms whose names we have mentioned, and to the members who had assisted.

Darwen Photographic Association.—February 19.—Mr. A. C. BALDWIN, representing the Eastman Company, gave a demonstration on the *Development of Bromide Paper* to a very good assembly of members and friends. Before proceeding with the demonstration, Mr. Baldwin showed and explained the workings of the Kodak and Kodet cameras. The latter is a very compact little focussing hand or stand camera, weighing about two pounds five ounces, which has only recently been placed on the market, but, according to Mr. Baldwin's report, has received a good demand. He then handed round a quantity of toned prints, the negatives of which he himself had taken with a Kodak, and, in addition to the quality and clearness of the prints obtained from Eastman films, speak very highly for the Solio on which they were produced. The tones varied from the rich sepia to the beautiful cold black tone, according to the bath used. Platino-bromide and Nikko prints were then passed round, and Mr. Baldwin showed, for the benefit of those who have no time to print during the day, how these papers may be substituted for printing-out papers in every respect. Equally as good a gloss may be produced on Nikko as on any gelatino-chloride papers, and may also be matted by following the instructions given with each packet. The sepia tones are obtained by toning in precisely the same way as all gelatino-chloride papers. The lecture-room was then made dark, and Mr. Baldwin proceeded to develop a number of enlargements and contact prints which he brought for the occasion, and, at the same time, answering any question satisfactorily that was put before him. The formula used, although not recommended by the Company, was sodium sulphite, 2 ounces; water, 20 ounces; amidol, 80 grains; and potassium bromide 10 per cent. solution, 3 drops to the ounce of solution. Four enlargements were developed and also about a dozen half-plate prints in less than half an hour with very satisfactory results. The prints, which are now the property of the Association, will shortly be on view in our local dealer's window, Mr. Ralph Shorrock, Chemist, Market-street. After the demonstration was over, the Secretary distributed sample packets of Eastman's platino-bromide and matt Solio paper. Previous to the adjourning of the meeting, the members and friends present bestowed their usual hearty vote of thanks on Mr. Baldwin for his much-appreciated services, and expressed their gratification to the Eastman Company for the kindness they have displayed to the Association and its members since the commencement. The next meeting will be held on Thursday, March 14, when Mr. J. T. Lees, of the Manchester Amateur Photographic Society, will deliver a lecture, illustrated by 150 slides, entitled, *The Riviera and Monte Carlo*, at which any one interested in the photographic art are invited.

Leeds Photographic Society.—On Monday evening last, Mr. W. J. WARREN, one of the Vice-Presidents, lectured in the Society's room on *Normandy*. The lecturer took his audience down the Seine from Havre to Rouen, from Rouen to Lisieux, Falaisé, Caen, Bayeux, Coutances and Avranches; then to Le Mont St. Michel, and then to Dol, Vitre, Dinan, and up the river Rance to Saint Malo, describing the tour from his frequent personal experience and with the aid of lantern slides. The tour offers unrivalled opportunities to the photographer of studying the early Gothic forms of architecture as well as peasant life strikingly novel in its quaintness from our more northern point of view, and Mr. Warren kept his audience deeply interested by means of his many personal reminiscences and a fine series of slides. There was a large attendance of members and friends, who showed their appreciation of the lecture by unstinted applause.

Midland Camera Club.—Owing to the sudden illness of Mr. R. J. Bailey (the President), Mr. H. R. Leech gave his demonstration of platinotype printing. He first showed some fine prints, both black and sepia on smooth paper, and also rough-surfaced paper, which had been kindly sent by the Platinotype Company, and then developed before the members, some prints exposed the day before. Personally, he preferred to work the cold bath paper with the hot bath, as he got more delicate tones, and not so harsh contrasts from under-exposed negatives. He had tried the other makes of platinotype paper in the

market, but had not succeeded in getting good prints; this he believed to be due to the faulty method of packing the paper. The secret of success was dry paper, dry pads, and dry frames, and the sooner the print was developed after printing the better. As a busy man, with very limited time for photography, he had for years used platinotype as the quickest, easiest, and if your time was of any value then certainly the cheapest process. Mr. Hughes, having been called abroad, his lecture on *Mines and Miners* will be given at the end of the session. Lantern slides were shown by Messrs. Beaumont, Cooper, Ryley, Leech, and Winchurch.

FORTHCOMING EXHIBITION.

1895.		
March 25–30	.....*Brixton and Clapham Camera Club. 11, Corrance-road, Brixton, S.W.	F. W. Levett

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

THE SPEED OF PLATES.

To the EDITOR.

SIR,—Will you kindly allow us to make a few remarks with regard to Mr. Cadett's letters which have recently appeared in your JOURNAL? As they appear to us to afford a possible opening for misunderstanding, we felt that a few words may perhaps prevent trouble in the future.

Mr. Cadett, of course, knows our position in the matter perfectly well, and would certainly, not knowingly, do us an injustice; but we think his remarks as to the influence of the developer upon the speed are so expressed as to be somewhat liable to misconstruction by the photographic public generally. The point to which we take exception is this: Mr. Cadett's remarks seem to us to admit of the construction that our attention was drawn by *him* to the fact that the speed of a plate depends upon the particular developing agent used. This is certainly not what Mr. Cadett intended to imply. In our original paper, published in 1890, we said, "There is a theoretical possibility that a plate may be rapid to one developer and slow to another, so as to require different exposures according to the developer used." From this it is quite clear that even then we were alive to the possible influence of the developer upon speed, though at that time, and with the plates and reducing agents then at our command, this influence had not shown itself in any marked manner. Since then a great advance has been made in the manufacture of plates, and the number of developers at our disposal has been largely augmented, with the result that what we foresaw in 1890 has been fully confirmed. The fact that a plate may have one speed to ferrous oxalate, and another to a more energetic reducing agent, is one of which we have, for several years, availed ourselves in our ordinary photographic practice; indeed, more than two years ago we published our experience with rodinal. From these remarks it will be seen that Mr. Cadett could not have intended to convey the impression that *he* had opened our eyes to the influence of different developers upon the speed.

And now to consider what Mr. Cadett does claim to have pointed out to us. It will be within public recollection that, in our orginal paper, we claimed to have discovered that the density ratios are unalterable, *not by different reducing agents*, but by ringing changes upon the proportion of the constituents of any given developer, say, for example, by altering the relative proportions of pyrogallol, bromide, and ammonia. We still, as firmly as ever, assert that, with the plates and developers we then had at our disposal, we did find the density ratios unalterable on varying the proportion of the constituents of the developer. But we must now admit that Mr. Cadett has placed such evidence before us, that, with respect to plates now obtainable, we feel called upon to reconsider our position in the matter. At present, however, we must decline to positively commit ourselves till we have time and opportunity to further pursue the subject experimentally. As soon as we have come to definite concluslons upon the subject, we shall take an opportunity of making them known.

The idea of permitting the use of two speed numbers emanated from Mr. Cadett, and we quite hope that, with its adoption, the value of our system will be more generally recognised. For the future, therefore, we have decided that plate-makers who use our system, and who wish to quote Hurter & Driffield numbers, must ascertain the speed with a standard developer applied under fixed conditions, the speed number so obtained being quoted as the "standard" speed. It will then be optional whether a second speed number be quoted as applying to any particular developer specially advocated by the maker, and, if this course be taken, the formula of the special developer must be supplied with each packet plates so marked.—I am, yours, &c.,

F. HURTER & V. C. DRIFFIELD.

Appleton Widnes, February 23, 1895.

To the EDITOR.

SIR,—I sincerely trust that Messrs. Hurter & Driffield will not permit their hand to be forced by Mr. Cadett in this matter, and that they will continue to refuse to allow their name to be attached to speed numbers which are not obtained with their standard ferrous-oxalate developer. Users of plates regard Hurter & Driffield numbers as referring to one definite standard, and as being a means of comparison between one plate and another, and several plate-users have complained to me that they have found Messrs. Cadett's plates overspeeded in comparison with the values marked on the boxes of other makers.

My chief reason for taking this view of the case is that all my recent experiments tend to show that although the gradation (or speed reading) of a plate can be altered by different modes of development, the alteration can be traced to one influence—fog. In my recent paper before the Royal Photographic Society I illustrated the alteration of gradation (and therefore speed) caused by the absence and presence of fog with the same developer, and also that such widely different developers as hydroquinone and metol give identical gradation (and therefore speed) if both are free from fog. If this is true, the importance of adhering to a non-fogging developer as a standard wlll be plain. An advertising plate-maker would only have to use as a standard the developer which gives the greatest amount of fog that a practical worker will pass in a negative, and he could then outstrip his competitors in the numbers announced in his whole-page advertisements. The evil in this direction is surely sufficiently great already. I know it will be said that the Hurter & Driffield system deducts the fog when reading the speed; but, if fog alters gradation, it does so by giving a greater deposit of fog on the lower gradations than on the upper, and the Hurter & Driffield system deducts the same amount from all gradations.

I do not claim that this fog theory is as yet absolutely proved, it is a matter which requires much investigation, and I hope that able investigators of the type of Mr. John Sterry will take it up. Work rather than controversy is wanted just now, and in the mean time I think that Messrs. Hurter & Driffield's previous policy of using a non-fogging developer as a standard should be adhered to.—I am, yours, &c.,

Hereford, February 23, 1895. ALFRED WATKINS.

THE RIGHT TO THE NEGATIVE.

To the EDITOR.

SIR,—Referring to the long account of the case, Theobald against Tyler, given in your issue of February 22, I must say that I think the judgment, given in this case by his Honour Judge Bagshaw, is altogether wrong. I believe that it is already admitted that where a sitter goes to a photographer in the ordinary way of business, and pays for, say, half-a-dozen cabinet portraits the negative, as a part of the means employed in producing those cabinets, belongs to the photographer. But the case is altogether different where a trade photographer, printer, enlarger, &c., is concerned, as in this case he makes negatives to the order of his customers for the purpose of supplying copies, enlargements, lantern slides, &c., to order. His customers know that a negative is necessary, and that the cost is usually charged in the estimate for work, and I maintain that the negative is altogether the property of the party ordering the goods, and should be delivered up to him on demand. I think this is a question that should be ventilated in the columns of your JOURNAL, being a matter likely to affect a large number of those who work for the trade.—I am, yours, &c., JOHN DONE.

(*Senior Partner in John Done & Co.*)

FOCUSSING METHODS.

To the EDITOR.

SIR,—I should be disinclined to enter into a discussion in the correspondence columns on the great Focus question, of which we heard so much a few years ago, but the prominent leader in your issue of this week again gives it importance.

I have frequently expressed my opinion that the method of focussing the principal object in a picture with sharpness, and, as you say, keeping the remainder of the subject in subordination, is, with our present appliances, an unsatisfactory one. In an article contributed to the *Camera* of September last I said: "As lenses are now made—hard, unpliable, and unamenable to anything but indiscriminating distribution of difference of focus in the various planes—the results must necessarily be abrupt and mechanical. The method will always betray itself. In short, photography is not equal to it. Happily, it is a system which is less practised than preached." It is of the highest importance in pictorial photography to eliminate all evidences of the mechanical element.

The conclusion I draw from your leader on this subject, where you allude, for instance, to the appreciation of the difficulties arising from the use of the lenses with which we have, ordinarily, to work, are that you do not differ with me in my ideas on the matter. Referring to the system, you say that it is precisely what every one worthy of the name of a photographer has ever done, but you are doubtful of the possibility of doing it effectively.

It may be a personal opinion, but I am bound to say that I have never yet seen a satisfactory photograph in which the method of focussing alluded to has been used. If such a one can be named to me, it would be for me a matter of much interest to consider; but, as I have before said, I think we do not often see examples, whether good or bad, at our exhibitions. And I am glad of it. Of course, if the lens were capable of greater freedom, and were more obedient to the desires and discrimination of the worker, it would be another matter.

I do not maintain, in opposition to the system which I have deprecated, that other methods into which diffusion enters (where the definition is practically uniform) are entirely free from objection; but, as matters stand at the end of the nineteenth century, we must be content in photography with a compromise, and I consider the system of compromise just mentioned the better of the two. Of two evils every one may choose that which he considers the least, and I see no reason why people should quarrel with those who choose either one or the other. Besides, vituperation isn't argument.

Four or five years ago I contributed some articles on the question of focus to several papers, and both in these and in my preface to the catalogue of the Exhibition of Brussels in 1892, I pointed out that what were thought to be quite modern ideas were, on the contrary, almost as old as photography itself. I quoted, as you have done, Sir William Newton, Mr. Leighton, and Mr. Buss; in fact, I followed the same line, and drew, I think, similar conclusions to those which your leader-writer has done. In addition to the names just mentioned, you allude also to Talbot, and there are others—for instance David Hill, and, above all, Mrs. Cameron—who must not be forgotten. How many there may have been besides, who worked on similar lines but did not make themselves conspicuous in print, it would not be easy to say. But I am acquainted with some, and these, curiously enough, in France—for, generally speaking, French pictorial photography is known to us by other characteristics. I think that there is no one man who is entitled to claim credit as an originator of ideas which have placed pictorial photography in the position which it now occupies, a position which it is no longer necessary to combat for the sake of principles which were covered with ridicule but a very few years ago. There is little to be proud of in the distinction of having made a suggestion, but to teach by work and example is another thing, and if I do not name the one who, with regard to the principles in question, has, perhaps (as a landscapist at least), done this more worthily and more persistently than any other, it is because I think there will be little difference of opinion concerning his identity.

In the heading to your article—*Naturalistic Focussing*—you introduce a term which has been little used of late years. In fact, I had hoped that we had heard the last of it. We are not concerned for the moment with its application to other arts; but, with regard to photography, no expression has been more misunderstood, and more egregiously misapplied. Even those who have used it most will, I think, agree with me in this.—I am, yours, &c., ALFRED MASKELL.

DEPRESSION IN PHOTOGRAPHY AND SOME REMEDIES.

To the EDITOR.

SIR,—I never take up your valuable paper, or any other photographic publication without finding some reference to "bad times." From personal experience I am much inclined to think it is bad photographers who complain.

The following rules have been tried and proved most effectual:—Ardent interest in everything pertaining to the profession. Good prices, to enable one to use time and material without stint. Careful study of character, peculiarities, and features of each individual sitter, however small the immediate order expected. Never send out questionable work. If the quality is not as good as that exhibited, discard it at once. No orders should be completed without first submitting proofs. (It does not pay to have three, six, or twelve bad advertisements circulated through one's particular neighbourhood. A photographer cannot judge if a picture is a good likeness; that is the friend's province.) Do not cut prices to improve business; nothing spoils the profession as surely as bad work, which must necessarily follow.

If business is falling off, it is a sure sign that you require further knowledge in lighting, posing, retouching, and greater care in all departments of work.

Photography is exacting, and cannot be profitably carried on if spare time is occupied with other hobbies. A successful photographer has time for only one.

From my experience of twenty years in many parts of the world, I maintain that those who cannot make a good living in photography are no ornament to the profession or good to themselves, and the sooner they enter some other business more suitable to their mental and artistic capabilities the better for all concerned.—I am, yours, &c.,

Worthing, February 25, 1895. MRS. WALTER GARDINER.

FADING OF PLATINOTYPE PRINTS.

To the EDITOR.

SIR,—Referring to your article on the above subject in your issue of the 22nd inst., I would like to remark, that so far as my experience goes I am satisfied that the degradation of the whites (or rather paper) of such prints is generally caused by a trace of the iron salts having been left in the paper, and, to ensure the latter retaining its pristine purity, it is necessary that the utmost care be exercised to ensure the perfect elimination of all trace of such salts. In my own (private) practice, the prints are passed through four acid baths, being well rinsed in each, during about thirty minutes, and finally washed in four or five changes of distilled water, or until all trace of acid disappears.

The third and fourth acid baths are also made with distilled water.

As it is very probable all "tap" water contains more or less iron it should not be used for cleaning or washing purposes, and to ensure more perfect work I would recommend that distilled, or carefully collected rain water be used for the last acid bath, and for the purpose of washing.

Of course, constant exposure to strong light will discolour any paper, but I believe the "yellowing" of the whites of platinotype prints, of which we hear now and again, may generally be traced to imperfect elimination of the iron salts.—I am, yours, &c., W. J. BARKER.

Hyde Park, Leeds, February 25, 1895.

DECADENTS AND THE SALON.

To the EDITOR.

SIR,—Your correspondent, "H. J. M." concludes his spirited defence of the Linked Ring by stating that admission to its Exhibition is almost as difficult as to the Royal Academy. If he had given any consideration to the reason for this, he would have seen that that statement alone constitutes a strong indictment against the "Ring." *Acceptance, or rejection of photographs submitted for their Exhibition, is decided by a committee of Judges, who are themselves competitors*, and a reference to the catalogue shows that the majority of the pictures are the work of the committee, though they are, numerically, a decided minority, roughly, one-fourth of the total exhibitors. These are facts that your correspondent can easily verify for himself, and he will probably admit that it is a universally recognised truth, that a competition, in which the Judges compete, cannot possibly be fairly conducted.

It would be interesting if Mr. H. P. Robinson could reconcile this with the statement in his letter, that "the Linked Ring is a successful and generous institution," and also that, "from the pinnacle of success, the members can afford to make allowances for weaklings in artistic skill." Where exists either the success or generosity in accepting their own works in an overwhelming majority, and rejecting those of their competitors? Is that mutual admiration society, called the Linked Ring, the only and final judge as to who are weaklings in artistic skill?

The circumstances that led to the formation of the "Ring" are very recent history, and for such an institution or exhibition to be respected as thoroughly representative, it is an absolute necessity that the fairness of its awards or competitive selection should be above suspicion. That admission is difficult is, under the circumstances, self-evident, but the reason is equally apparent.—I am, yours, &c., HENRY W. BENNETT.

Hastings House, Norfolk-street, Strand, W.C., February 26, 1895.

NATURALISTIC FOCUSSING AND PROGRESS.

To the EDITOR.

SIR,—Your very opportune leader on *Naturalistic Focussing* shows that, at least, one writer on photography has not lost his head in this matter, and has some knowledge of the history of the art. You have shown clearly that there is not only nothing new in the idea or practice, but that it is as old as the Photographic Society itself, which has just given its progress medal to Dr. Emerson, presumably for the re-invention of an old discovery, which, however, has been brought to all the perfection of which it seems capable by some clever photographers, who seem to be able to get pictorial results out of any material or method. If any credit is due to any of the out-of-focus school, it is to Mr. George Davison, who has made some agreeable pictures in that intractable style; but he is an artist, and knows how to modify his treatment according to his subject.

"Naturalistic focussing" surely cannot be the "progress" for which the medal was awarded. You state that the medal is given for the most important addition to previous knowledge that has been made during *the last three years*.

Now, Dr. Emerson's wonderful supposed discovery does not come within the time specified in this statute of limitations, and further, if the connecting influence of time had not barred Dr. Emerson's earlier claims, his famous pamphlet on the *Death of Naturalistic Photography* certainly put all he had done before 1891 out of court. Other things, however, have come within the three years that may justify the "progress" for which he is awarded a medal. In March, 1893, he read at the Photographic Society a curiously involved physiological and psychological paper to prove that photography occupied a lower level than that in which he had sought to place it in his book. Did he get the medal for this? In 1893 he exhibited at the Salon; this was indeed progress, but not the progress I fancy for which a serious Council of the Royal Photographic Society, who

never joke, give a medal, and I do not hear of him exhibiting for the benefit of the art, and in the cause of progress elsewhere, during the three years. Of late, something again seems to have "curdled the milk of human kindness within him," for in a contemporary to-day, I notice that he empties the vials of his wrath on the Salon. Finally, I ask, why the medal for progress to Dr. Emerson?—I am, yours, &c., H. J. M.

February 24, 1895.

P.S.—Let me present the Royal Photographic Society with an idea. One of your correspondents (February 8), who signs himself "Alert," says that Dr. Emerson's *pictures* rather than his theories should be studied. Nothing I should think could be easier. Let us have an exhibition of the pictures Dr. Emerson has produced during the last three years at the Society's rooms. They might do so much for "progress."

ALPINE PHOTOGRAPHY.

To the EDITOR.

SIR,—E. W. C. is naturally puzzled by the diametrically opposite opinions as to exposures necessary in alpine photography, which can only be accounted for by the widely varying ideas as to what is a correctly exposed negative. A one-thousand-two-hundredth part of a second, with *f*-32 on an old plate, savours strongly of Jules Verne, and requires an awful lot of salt to make it go down. I began photography in the Alps in August, 1873, when I made the ascent of Mont Blanc, myself and cameras and guides being snowed up on the Grands Mulets for two days, and nearly lost my focussing paw through frost bite. Gelatine plates were unknown, and the only successful exposure was three minutes at an elevation of 10,000 feet. Since then I have exposed a variety of plates and films at various elevations from the gloomy ravine to the dazzling snow peak and the green-blue glacier, in July, August, September, October, and November, from 5 a.m. to 7.30 p.m. I have found a full exposure essential to the *best* result. This is especially true when a foreground of trees and dazzling snow peak are included; otherwise the delicate shadows of the snow will be hopelessly blocked up in a fruitless endeavour to develop detail in the foreground. In such cases I give same exposure as I should at home on a similarly lighted landscape. Such scenes are easy to photograph on a clear evening, or a dull day, but distant mountains are apt to look painfully sharp and near, and under-exposure is admissible to secure atmosphere. Views of snow and ice should be sunlit, and taken as little on the shadow side. Snap shots may in such cases be made, but even then the shadows determine the time of exposure. Sunlight is unnecessary for near details of the foot of a glacier, but an isochromatic plate and colour screen will best render the delicate contrast of the white crust with the green and blue fissures.

As an example of a most difficult subject, last August I walked up the Rigi from Weggis with a whole-plate kit. After an hour's tramp, on turning round a scene of enchanting beauty presented itself. A rounding pathway fringed by dark pines and smaller shrubs, leading down to the green blue Lake Lucerne far away below, with the village of Vitznau like a cluster of toy houses dotted on the water's edge. On the opposite bank rose, one above the other in a sublime panorama, the Uri and Engelberg Alps, capped with snow and wreathed with cloud bands. The lake and mountain shimmered in an intensely actinic blue haze. The nearly vertical sun would have shone across the lens but was obscured with fleecy clouds. I had an Edwards's isochromatic medium film, but no colour screen, and stop *f*-28. A quarter of a second would have been ample for the lake and mountains, but I was on the shadow side of the trees, and gave two seconds. It proved rather under-exposed, the trees though full of detail have to be masked to print the distant mountains and clouds properly. I since found that with the sun in front of the foreground, though veiled with clouds, at least one-half more should be given. A colour screen would have assisted. A few examples of exposures which have yielded technically perfect negatives may be helpful.

Zermatt Valley and the Matterhorn: bright sun, September, isochromatic medium film, *f*-32, two seconds. The Matterhorn from 7000 feet up the Riffelberg: pure white cloud bands across near the summit, backed with deep blue sky, brilliant sun, 2 p.m., trees and châlet in foreground, *f*-16, one second. Same repeated with Ilford No. 1 colour screen, four seconds. The details in foreground, the white clouds, the whiter snow on the summit, and the blue sky are all in correct value. Matterhorn from the Gorner Grat, 10,200 feet: cloudless blue sky, midday sun, all dazzling snow from the camera to the horizon, isochromatic medium film, *f*-22, one-fifth of a second. Every footmark in the snow, and a small cloud banner on the summit of the Matterhorn are delicately rendered, the sky printing a shade darker on printing-out paper. A sea of clouds filling the Zermatt Valley, from the Riffelberg Hotel, 8000 feet at 6 a.m., the pure white Weisshorn, genial Rothhorn, &c., tipped by the rising sun, isochromatic medium, colour screen, *f*-32, thirty seconds, slightly under-exposed in one corner of the foreground owing to the inferior illumination of a wide angle lens at the margin. The Rhone glacier and Galenstock, with all the surrounding basin of grey mountains, and the Rhone with its wooden bridge, 4 p.m., August, isochromatic medium film, *f*-25, one second, bright, no sun, perfect. The foot of the glacier close to 10 a.m., *f*-16, colour screen, cloudy, four seconds.

I use pyro-ammonia, beginning with, say, half a grain pyro, one grain bromide potass, and half a minim of ammonia per ounce, until all details are out, then add the full quantities recommended by the maker to rapidly pile on the density, which I keep moderate. Some subjects which are all snow are often better with two or three times the normal amount of bromide.—I am, yours, &c., A. A. PEARSON.

Leeds, February 22, 1895.

To the EDITOR.

SIR,—I may be able to give your correspondent, "E. W. C.," some information, especially with regard to his final reference concerning the use of an actinometer. He is right in assuming that the usual rule is to "test the light which falls upon the subject," and that it is obviously impossible to do this in the case of distant mountains; but, if we were able to do so, we should not get any nearer the problem, for the lessened exposure which (in our climate) is required for distant mountains is caused by the veil of mist which intervenes between the lens and the mountains; in fact, we are photographing a thin cloud with the mountains peeping through, and just in proportion to the amount of mist or cloud which intervenes should the exposure be lessened towards that required for a cloud pure and simple, viz., about one-tenth the exposure for a landscape.

But in the higher Alps the distant mountains require, as a rule, no more exposure than near objects under the same light, for the air is almost free from mist and refracting particles. From the same cause, the sky is often a deep blue-black, and reflects very little light; the shadows in an Alpine picture are therefore poorly illuminated in comparison with the sun-lighted part, and, if shadows are exposed for, a comparatively long exposure is required. I have photographed in the higher Alps on two trips, and have certainly found exposures based on an actinometer just as reliable as in lower altitudes. If the skylight is poor, the actinometer gives its value exactly; if the sunlight is more powerful than in lower altitudes, it indicates its value.

Captain Abney is the best authority on this question, and he gives much information upon it in *Photography* for October 6, 1892. He mentions that, with the most rapid plates and a focal-plane shutter working at $\frac{1}{1000}$ of a second (or one between the lenses at $\frac{1}{500}$), good pictures can be got in best light in the higher Alps with *f*-16.—I am, yours, &c.,

Hereford, February 16, 1895. ALFRED WATKINS.

To the EDITOR.

SIR,—I notice in your "Answers to Correspondents" an inquiry regarding "exposures on snow in Switzerland." I believe I am the person referred to by your correspondent; if not, at all events I can throw some light on the subject. I will not deny that actinism is greatly accelerated by moisture, and it was a constant practice of mine, when in business, to spray with water the floor of the studio and its approaches, also keeping a wet rag in the camera as a dust attracter. My experience is that at high altitudes the exposures require to be much reduced, even where there is no snow. Some years ago, when photographing on the Maritime Alps, about 1600 feet, I had to make a third visit, I so much over-exposed on the former occasions; and now, in the climate of Northern Africa, I have had similar experiences. I have lately returned from Timgad and Hammam R'Irha, the latter place only over 1000 feet above Mustapha. Exposures had to be reduced one half. The thinness of the air has much to do with actinism, which more than compensates for the absence of moisture. At Davos Platz and St. Moritz, under 6000 feet above sea level, I got fully exposed negatives with a Paget prize XXX times plates, *f*-32 stop, Thornton-Pickard focal plane shutter, screwed up beyond the register 1000, say 1200 of a second. I always warm my developer to 70° Fahr. Probably the party who says "two and a half times the exposure" does not keep his developer at a uniform temperature. I have been experimenting lately with a compound developer, made in a peculiar way, which seems to give wonderful results. If it is not a "mare's nest" I will send you particulars.—Iam, yours, &c.,

A. L. HENDERSON.

Grand Hôtel St. George, Mustapha, Algiers, February 19, 1895.

AN EASTER CAMERA TRIP.

To the EDITOR.

SIR,—A number of members of the Hackney Photographic Society have combined to form a "camera" trip at Easter to the Continent. This is not quite full. Any readers of the JOURNAL will be welcomed—even "Cosmos," who last week fined us 30*l.* for the benevolent!

This is an excursion of quite a co-operative character, and I should like to draw attention to the quite nominal figure for which this trip of fifteen days has been arranged, namely, twelve guineas. The time will be spent

visiting the following interesting and photographic spots: Brussels (or Paris), Lucerne and its lake, Milan, Venice, and the Italian lakes if desired.

I should be pleased to furnish further details and any photographic advice I am able to give anent the trip.—I am, yours, &c.

6, *The Grove, Hackney, February* 26, 1895. SAMUEL J. BECKETT.

EXHIBITION OF PHOTOGRAPHIC LENSES.

To the EDITOR.

SIR,—In connexion with the meeting on March 26 the Council are organizing an Exhibition illustrative of the evolution of photographic lenses.

I should be glad if you would allow me, therefore, through your columns, to invite the loan of historically interesting lenses or articles connected therewith for that purpose.

Every care will be taken of the exhibits which should reach me not later than Friday, March 22.—I am, yours, &c.,

R. CHILD BAYLEY, *Assistant Secretary.*

50, *Great Russell-street, Bloomsbury, February* 22, 1895.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

RECEIVED.—C. Menton.

A. L. H.—Received. Next week.

A. E. STANLEY.—Ordinary water colours, as supplied by the artists' colourmen.

A. HORSLEY HINTON.—Your surmises are entirely at variance with the real facts.

J. A. DRAYCOTT.—Apply to the Assistant Secretary of the Royal Photographic Society, 50, Great Russell-street, W.C.

OLD BILL.—The lenses of the makers named are considered excellent. The one specified is suitable for taking groups in the studio.

W. A. WHISTON.—We cannot give any information concerning the Photochromoscope other than what has been published, and do not know from whom the instrument can be borrowed.

A. O. X.—Amyl-acetate is not usually kept by ordinary druggists, except perhaps under the name of "Essence of jourganille pears." It may be had from such houses as Hopkins & Williams or Mawson & Swan.

SIDE LIGHT.—Blue curtains will of course stop off more light than white ones; but the trouble will perhaps be better met by using, in that aspect, two or more thicknesses of thin white calico, to be drawn as occasion may require.

W. A. COLE.—The print is apparently a silver one, and probably produced by development. The thing is not nearly so novel as you surmise. It is surprising how they can be done at the price you mention, if they are done at that price (?).

F. ALLAN.—Any of the stationers in your town will procure paraffined paper for you if they do not keep it in stock. Messrs. Marion & Co. supply a similar paper, under the name of "papier minéral," which is admirable for studio windows.

STEREOSCOPIC.—Your query relates to copyright in literary works, and not photographic ones, therefore it does not come within our province to reply to it. Presumably the copyright belongs to the author, unless there is an agreement to the contrary.

PROCESS.—Whether you will be entitled to use the coat-of-arms and the crests will, of course, depend upon the terms upon which the partnership is dissolved. The one who carries on the business will, doubtless, retain the right to them, as well as the copyrights.

S. T. A. (York).—The slide sent would be of no good whatever in the lantern. It is stained by the developer and fogged in the lights. Lantern slides must be perfectly transparent in the lights and free from "pyro stain." Evidently the plates used were not intended for transparencies.

HARRY W. COX.—Sorry we are obliged to omit publication of your letter, although sympathising with its objects.

J. U. (New Bond-street) writes: "Would you kindly inform me how best to photograph on to a steel die for etching?"—If the subject be in line, the bitumen process or the bichromated gelatine one, as used in "zinco" or process work. If half-tone, the carbon process will be best.

STUART.—The darker of the two colours will do; if it were still darker, it would perhaps be better—according to the aspect of the studio. Suitable material for blinds of various tints may be had of any of the large upholsterers in London under the name of window holland. Such houses as Maple's or Shoolbred's, Tottenham Court-road, keep it in many different colours.

COLLOTYPE asks: "Can you inform me through your correspondence column if collotype plates ready-sensitised are to be had from dealers? also any good book on the working of the collotype process where to be had?"—Ready-sensitised collotype plates are not supplied. They must be used within a day or two of their preparation. Dr. Schnauss's work, published, we believe, by Iliffe & Co.

T. SIMMONDS.—If the official surveyor says the building cannot be allowed, if constructed according to the plans shown, you may be pretty certain they will not be passed by the local authorities, although you may think they are in accordance with the Building Act. It will, we think, save you a deal of time and trouble if you at once modify the plans to meet the views of the powers that be.

M. V. says: "I have been trying to make matt varnish as follows: Gum sandarac, 180 grains; gum mastic, 40 grains; ether (methylated), 2 ounces; benzole, 1½ ounce. I cannot get it to dry matt. Is the formula correct, please?"—The formula is quite correct if the proportion of solvents had been double. Add two ounces more ether and an ounce or so more benzole; then the varnish will, or should, give a matt surface.

D. Mc. D.—If the illustration is a copy of your photograph, which is copyright, proceed at once against the publishers for penalties, and also for damages, if you have sustained any by the piracy. We should advise you to secure the services of a solicitor who is well versed in copyright law in the first instance. Probably, when legal proceedings are commenced, the publishers will be glad to compromise the matter, and they will be wise to do so if the case be as stated.

A. TITSALL writes: "I should be very pleased if you could tell me the best lens to take cabinet groups in a studio twenty feet long, as the cabinet lens I have will only focus one figure sharp."—The only thing to do is to get a lens of shorter focus, which will include a wider angle; but it must be borne in mind that then the perspective will be very violent and unpleasant. Instead of getting another lens, it will be better to lengthen the studio, if possible. Twenty feet is much too short for taking groups in.

101.—If your solicitor cannot answer the question, we can scarcely be expected to do so. Perhaps this, however, will meet the case. If you erect a studio in such a way as to obstruct your neighbour's light, provided he has the privilege of "Ancient lights"—that is, enjoyed an unobstructed light for twenty years—he will have cause of action at law. If he cannot claim ancient lights, you are entitled to erect what you like on your own premises, and he has an equal right to erect any hoarding or wall on his premises to stop off the light from your building. Probably this reply will assist you.

STUART LANCASTER writes: "Could you tell me of a substance that is slightly soluble in water, and that is at the same time firm when in tablets of, say, one-eighth of an inch thickness, two inches broad, and six or seven inches long? My desire is to incorporate certain chemicals with the substance so that in the first place the substance should be capable of being made into a stiff paste, then spread out to become solid."—Possibly gelatine, with a certain proportion of chrome alum would do; but, as we do not know what the "certain chemicals" are, we cannot say what their action would be on the compound.

A. F. P. writes: "Thanks for your reply to my query *re* collodio-bromide. Although I am an old 'wet' hand, and pine for similar results, I am entirely ignorant of 'dry' collodion. May I still further trespass on your good nature by asking for a reply to the following questions? 1. Can collodio-bromide be worked to give best results for views, &c., where length of exposure is no object? 2. What is the difference (if any) in the rapidity and final result between washed and unwashed emulsions? 3. Which do you recommend? 4. What is the function of the 'organifiers' enumerated on page 841 of current ALMANAC?"—In reply: 1. Yes. 2. Not much difference, conditions being even. 3. Quite a matter of convenience. 4. To increase vigour in the negatives, and somewhat add to the sensitiveness of the plate.

CONTENTS.

	Page
ASTIGMATISM: WHAT IT IS AND WHAT IT DOES	129
THE AMMONIUM CARBONATE DEVELOPER. By MATTHEW WILSON	130
CONTROL IN DEVELOPMENT: A REPLY TO MR. EDWARDS. By ALFRED WATKINS	132
A REPLY TO MR. WATKINS. By B. J. EDWARDS	133
DEVELOPMENT AND FIXING. By JAMES GADETT	133
TONING PLATINUM PRINTS. By ALFRED W. DOLLOND	134
PLATINUM BLACK TO SEPIA AND VANDYKE. By HECTOR MACLEAN	135
CONCERNING THE LICK TELESCOPE	136
OUR EDITORIAL TABLE	136
NEWS AND NOTES	137
RECENT PATENTS	138
MEETINGS OF SOCIETIES	139
FORTHCOMING EXHIBITION	141
CORRESPONDENCE	141
ANSWERS TO CORRESPONDENTS	144

THE BRITISH

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ARTIFICIAL ATMOSPHERE.

It seems preposterous to expect to obtain atmospheric effect in a photograph when there is none visible in nature. The true idea of distance under such circumstances is only obtained by observing the diminished aspect of objects of known dimensions in proportion as they recede from the point of view. Painters have it in their power to play with atmospheric perspective when there is in reality none appreciable, but this is largely beyond the power of the photographer.

In some countries, and also in our own under special atmospheric conditions, the clearness is so great as to render it absolutely impossible to even guess at the distance of objects, which recalls the incident of the two tourists in Colorado. One morning they intimated to the landlord of their hotel that, before taking their breakfast that day, they would go for a walk just as far as that eminence (pointing to it), and would return within an hour. To their surprise, they were informed that the eminence alluded to was over fifty miles distant from where they then were. The perfect clearness of the Colorado atmosphere had rendered them incapable of estimating distance. Piazzi Smyth, F.R.S., too, when located up the Peak of Teneriffe in the interests of astronomical science, narrates like incidents consequent upon the extreme clearness of the atmosphere.

We once knew of a painter and a photographer being present at a certain place with the intention of depicting a particular view, each by means of his special art; but such was the extreme clearness of the atmosphere, that the photographer quite failed in making a picture which conveyed to the spectators a correct idea of the fine gradations of distance by which the scene was characterised; whereas the painter, by introducing atmosphere in varying degrees, according to the distance of the headlands which projected one behind the other at no great distance, managed, by this exercise of his skill, to make each to stand out in bold distinction from the other.

Some years ago we were placed in a position almost similar to that of the photographer just alluded to. It was necessary that we should obtain a photograph of a particular headland, and, as it was required for a scientific purpose—that of showing very distinctly its contour, geology, and flora—it was of importance that it should be well pronounced in each individual feature; but it was found that, in consequence of other groups of trees situated on an eminence about 200 yards behind those which were to form the subject of the photograph, the outlines of the latter were so much interfered with as to render it apparently impossible to take the view in the manner in which it was desired. On the ground glass of the camera the scene that was there represented was one of much confusion as regarded the estimation of distance. A view taken stereoscopically fulfilled the conditions in the most admirable manner, giving the true relations of the distances; but this would not do, as a monocular or single picture alone must be had. By what means, then, could a background be obtained that would separate the desired promontory subject from the intruding scene behind? A happy thought occurred. Procuring a quantity of damp straw, this was divided, and deposited in parcels in a gully which intervened between the promontory that was to be photographed and the subject which it was necessary to exclude, or, at any rate, to subordinate. Everything being in readiness, an attendant boy set fire to the straw, by which a cloud of smoke was emitted, that spread and blocked out the farther scene, and formed a light, hazy background to the nearer promontory. In the finished photograph there appeared only a faint outline of the salient features of the objectionable distance, thus happily deprived of its power of interference with the subject that was wanted.

Subjects which lend themselves to the application of an artificial atmosphere of a nature similar to what we have described are ancient crosses backed by architecture of an ornate nature. A restoration of one of London's ancient crosses was, for the reason given, photographed immediately after a workman had walked behind it, bearing in his hand a brazier filled with ignited wood shavings smothered with sawdust. Any special tree, the outlines of which are marred by others at no great distance behind it, forms a suitable subject for the experiment. By the aid of the substantial smoky atmosphere a tree can, without difficulty, be isolated from its fellows, which need not, however, be entirely obliterated. So with tombstones in a crowded cemetery. Every one who has tried to photograph in a graveyard knows with what difficulty it is that the isolation of any one of these is achieved.

The method here described of subordinating any object that thus would interfere with the proper representation of the chief object, or that to which we desire due prominence being given, far excels the more simple one of stopping out or subduing the undesired portions by painting on the back of the negative with a suitable yellow varnish, leaving untouched such portions as those to which the maximum vigour is desired to be imparted.

For an absolutely correct method of rendering gradations of distance, scientifically rather than artistically, the stereoscopic method must be had recourse to.

OWNERSHIP OF NEGATIVES: A TRADE QUESTION?

In the correspondence columns last week a writer questioned the correctness of the decision given by his Honour, Judge Bagshawe, in the recent suit of Theobald *versus* Thomas, in which the ownership of certain lantern-slide negatives was in question, and which was commented upon the week before. The communication raises a point, which, if recognised, would unquestionably tend very far towards upsetting what is now fully established by law, namely, that negatives taken in the ordinary course of business are the property of the photographer who takes them.

Our correspondent says he considers that, in working for the trade, the right to the negative is different from what it is when working for the public. But why? His point seems to be this: With the trade photographer the negatives are made "for the purpose of supplying copies, enlargements, lantern slides, &c. to order," and he adds that his customers know that a negative is necessary for the purpose, and its cost is included in the charge for the work, and, for that reason, the negative should be the property of the latter. Now, this is diametrically opposed to the decision of the Judge in the suit referred to, and that ruling was arrived at after duly hearing witnesses, both for and against, as to the custom in the photographic business. His Honour said he saw nothing in the case before him different from that of the general photographic trade. And why should there be, seeing that there was no special agreement or contract to make it otherwise? There was no stipulation that the negatives when produced were to be the property of the plaintiffs.

It is difficult to reconcile our correspondent's views on the subject, for he says that, in the case of, say, cabinet portraits, the negative is a part of the means employed in producing those portraits, and that therefore it belongs to the photographer; but, with regard to the trade worker, he curiously enough says, "his customers know that the negative is necessary," and therefore it ought to be his property. Where, it may be asked, is the sitter who does not know that a negative is necessary to produce the portrait, and also that is why the first portrait, or first dozen portraits, is or are charged at a much higher rate than are subsequent copies? Our correspondent's argument, if it had any weight, would seem to show that if the sitter knew that a negative was necessary, and as more was charged for the first portrait, he would be entitled to that negative. Yet that he denies; but, in the case of trade workers, though the conditions are identical, he considers that the customer should have it as being his property. How can these two ideas be reconciled? In the case of portraits, the cost of the first ones includes the sitting and the taking of the negatives, after-copies being supplied at a reduced rate. In the lantern-slide case, the price of the first slide was a couple of shillings or so, that price including the making of the negatives, after slides being supplied at about a quarter of that sum.

Let us take an every-day case in point. A photographer sends a negative to a trade enlarger to have an enlargement made from it, either in carbon or platinum, as the case may be. Now, with either process, an enlarged negative has to be made; but, before that is done, a transparency has to be produced, and, in the case of the enlargement from a paper print, a small negative has first to be taken from that. As a matter of course, all this work is included in the price of the complete enlargement, what the photographer orders and pays for, subsequent copies, if required, always being charged at a much reduced rate. Now, the argument, if argument it be, in the letter calling for these comments, is that, because the photographer knows that a negative is necessary, and he pays more for the first production than for after-copies, the negative is his property. If he were entitled to that, why not also to the transparency from which it was produced, and, in the case of a paper original, why not to the negative of that as well, for an additional charge is always made when the enlargement is from a paper picture instead of from a negative supplied?

Let us look at what is the trade usage in this matter, for an established "custom of trade" is looked upon in Court as an unwritten law, and that custom of trade is that the negatives and transparencies are the property of the trade enlarger just the same as portrait negatives are the property of the photographer. In a trade price list of the oldest firms of enlargers in London now before us, which, by the way, is similar to those of other houses that work for the trade, an enlargement in carbon of a certain size is quoted at thirteen shillings and sixpence, and after-copies at half-a-crown each, less than one-fifth the cost of the first picture. The price of the first print, of course, includes the making of the transparency and the enlarged negative which every one knows are a necessity. But does that entitle the customers to them? No; for a well-established custom of trade decides that it does not. On another page of the price list quoted from, are the prices at which the enlarged negatives can be purchased should customers desire to buy them. The price, it may be mentioned, in the case of the size just quoted, we find is four and sixpence, or exactly one-third the cost of the enlargement in the first instance. Further, on the same page are also the charges for retaining the negatives for certain given periods. We know quite well that this custom has been an established one amongst the trade generally for a couple of decades and more, and that is quite sufficient to prove that the negative is the property of the one who produces it.

If, however, a separate and distinct charge is made for the negative, whether it be the portrait of a sitter or is for trade purposes amongst the trade, then by right it is the property of the one who pays for it. So, of course, it would be if there were an agreement, or contract, in the first instance that it should be given up to the customer, but not otherwise.

PHOTOGRAPHING ABNORMALLY LIGHTED SUBJECTS.

The day is long since past when photographs by moonlight, gaslight, or lamp light, to say nothing of magnesium or electric light, were considered objects of curiosity, for such pictures may be said now to be well within the boundaries of artistic possibility, and, indeed, have actually entered into direct competition with daylight pictures in more instances than one, as witness Mr. E. Baynes Rock's successes in the form of studies by lamp light, while the winning picture in the recent competition in orthochromatic plates was also produced by the same light.

We have in our possession at the present time a copy of one of the earliest lamp-light pictures on gelatine plates taken by Mr. Charles Bennett in 1878, and one of the pictures which, in fact, converted photographers to a belief in the wonderful properties of the new process. Looking at it as a picture, it is impossible to say in what manner it could be excelled at the present day, although, no doubt, with modern films, and more

especially modern developers, the result would be attained with a considerably shorter exposure. Turning to moonlight pictures, the first of which we have any definite recollection was one sent to us by Mr. Alexander Henderson, of Montreal, in 1879, which represented a snow-clad Canadian landscape bathed in full, clear moonlight, the subject being depicted with as much distinctness as if taken in sunlight. Other experimentalists soon followed in our own less favourable atmosphere amongst whom we recollect the names of Mr. A. L. Henderson and Mr. Edward Dunmore; but in all these instances the exposures were reckoned by hours, and in some, at least, portrait lenses with full aperture were employed.

At the present day, while the actual results obtained are immeasurably superior to the majority of the earlier attempts, the exposures have been reduced to such an extent that it is quite possible to hope that, in the not distant future, *real* moonlight pictures of a truly artistic character may be found to occupy places in our exhibitions. At a recent meeting of the Photographic Club, moonlight pictures were exhibited, in the production of which the exposure had been reduced to 15 minutes, with an aperture of *f*-8, and at the last full moon using *f*-16. We ourselves, with an equivalent exposure—actually one hour—produced a picture that is scarcely distinguishable from a daylight one.

It is quite credible, then, that, among the hosts of amateurs on the look-out for novelties in the way of artistic work, we may shortly find some bold enough to venture into the realm of moonlit landscape in a pictorial, as distinguished from the merely experimental, sense. There is really no technical difficulty in the way beyond the selection of subjects which, in addition to possessing the necessary pictorial qualities, are also adapted to moonlight rendering. But some little judgment will, as a matter of course, have to be exercised in order to observe the latter condition, for, although Sir Walter Scott's description of "fair Melrose" by moonlight sounds extremely poetical, the too literal translation of the passage,—

> "When buttress and buttress alternately
> Seem framed in ebon and ivory,"

would scarcely have as pleasing an effect, pictorially, but would prove rather suggestive of the old style of "soot and whitewash" picture. Still, between the extremes of photographing a scene by moonlight, in such a manner as to make it resemble a sunlight view, and rendering it in pure black and white, there are many intermediate grades, and it will naturally rest with the individual to bring his artistic conception—and his technical skill—to so bear upon the subject as to give it a semblance of what it is intended to represent.

Looking at the matter from this point of view, it is needful to consider in what respect moonlight or lamp light differ from daylight, or in what respects the subjects illuminated by them require different treatment from that given in the case of daylight. Naturally, the first difference is that of exposure, and it will probably occur to many of our readers that there the difference ends. Not so, however, for, if the same scene be photographed by daylight and by moonlight respectively, the relative exposures being adjusted in each case so as to fully impress the better lighted portions of the picture, the effect in the shadows will be widely different. In the daylight picture, if fairly well and evenly lighted, the deepest shadows will be found to possess more or less detail according to the actual amount of exposure given; but, in the moonlight rendering, although the fully lighted portions of the subject may be well enough exposed, the shadows and even half-shadows will be found to present nothing but perfectly clear glass. In fact, in order to secure anything like a tolerable result, the exposure must be increased to a far greater degree than is absolutely necessary for the high lights.

The reason for this is readily explained if we remember that the shadows in either case are dependent for their illumination entirely upon reflected light. In the case of daylight, the light that goes to form the shadows is reflected, not only from surrounding objects but also from the sky itself; and, moreover, that owing to the immense amount of diffused light emanating from the sky, or rather the clouds, the reflected light from local objects is also very considerable; but, when working by moonlight, the circumstances are altogether changed, and the work done is almost entirely confined to the moon's direct rays, more especially if the night be clear and cloudless. In that case there is practically no light diffused from the sky, and consequently none, or next to none, reflected from close objects to light up the shadows of the picture; and what light does reach them from the moonlit portion of the subject is of so comparatively feeble a character as to be out of all proportion with the direct rays. If the sky be partly filled with light clouds, then, as in sunlight, the light will be more evenly diffused, and more of it thrown into the shadows, and consequently the exposure will be proportionately shorter, but under the most favourable circumstances there will always remain the fact of the extremely feeble nature of the reflected light.

The appearance of the picture as it strikes the eye is very little criterion as to the way in which it will photograph unless the facts already stated are clearly borne in mind. For instance, we look on a scene, a street view, a building, or any subject showing strong contrasts, on a clear moonlight night, and we find it stands out in strong relief, the lighted portions appearing as well illuminated as if by daylight, the shadows, represented by inky blackness, conveying the idea that photographically it would be represented in the strongest possible contrast. Give a long enough exposure, however, and the result will be very similar to what would be obtained in rather dull daylight. On the other hand, view the same scene on a cloudy night about full moon, but when no moon is visible; to the eye every detail will probably be clearly visible, almost indeed to the deepest shadows, and the general impression is one of the greatest softness. Try the experiment of photographing the scene as we did last year, and the result will prove that the most protacted exposure it is possible to give within the bounds of darkness will result in but the feeblest of renderings of the salient features of the subject, the shadows and even half-shadows producing not the least impression on the most sensitive film.

Turning for a moment from moonlight to lamp-light studies, we shall find the conditions again vary very materially. Studies by lamp light will, in the majority of cases, be interiors, and here we shall probably find things the reverse of what they are in the case of moonlight, or that we get a proportionately better result by artificial light than by daylight. In the moonlight picture we suffer from the absence of a reflecting sky, while, with the gaslit interior, we have the advantage of an artificial sky, so to say, inasmuch as the ceiling of the apartment arrests and reflects the whole of the light that would otherwise escape into space, and, unless the room is a very spacious one, a similar function is performed by the walls. In ordinary rooms, a

comparatively small proportion of the daylight that enters by the window or windows has any chance of reflection from the ceiling, and what little suffers reflection from the walls goes but a small way towards counteracting the harsh contrast produced by the concentrated direct light, to effect which end the exposure itself must be correspondingly prolonged. Thanks, therefore, to the better distribution of the artificial light, the exposure, as compared with daylight, will be proportionately less, taking into consideration their relative actinic force.

From what has been said regarding moonlight effects, it is plain that in producing these we must select such an exposure as will secure the result we wish to arrive at without destroying the moonlight character of the picture, and, at the same time, guarding against over-intensity in the high lights. Evidently in this we can gain great assistance from a judicious modification of the development, and, in a general way, it will be found advisable to use a combination that tends to produce softness without density—a developer, in fact, that will get out as much detail as it is possible to get out regardless of density in the lights. If the exposure be properly timed, the latter will be all right, especially as there is no risk of reversal and very little of halation of the image.

A similar course is indicated in connexion with artificial-light subjects, as, although from the more even distribution of the lighting there is less necessity for forcing the shadows, still, from the brilliancy and concentrated character of the illumination, it will be desirable to counteract, as far as possible, a natural tendency to harshness of contrast. In this case, however, much, if not all, will depend upon the distribution of the sources of illumination.

The employment of orthochromatic plates is so obviously indicated that we need scarcely call attention to their additional power, especially in connexion with lamp-light effects. Personally we have not found much advantage to accrue from the ordinary orthochromatic films in moonlight exposures, possibly owing to their not being of the most suitable kind for the purpose. Theoretically, plates sensitised for the green should be useful under these circumstances if they do not to any great degree slow the general action.

PRINT-WASHING.

The great frost of 1895 bids fair to constitute an era as regards that most important part of photographic technics indicated by our title. It may be said that hitherto the traditional three courses have been considered open to the printer: the best way, the cheapest way, the shortest way; but for some weeks past it may, in a large number of cases, be said that a fourth course, any way, had to be considered in practice. Of course a large body of workers have simply done no photographing at all, at least as regards printing, during this glacial epoch; but a further large body, who have commercial interests at stake, have been compelled to print as closely as ever, and make the best of their surroundings.

Now, whatever may have been proved, or shown to the contrary, to be advisable, it is undoubted that a large number of professional printers have, for long years, adhered to the practice of long-continued washing of prints, combined with a continuous change of water; but, with water a little more difficult to obtain than claret, such methods have, with few exceptions, been perforce abandoned, or work discontinued. The conservative in practice has had to leave his beaten paths, and, adopting, with original temporary intent, new modes of washing, look at possibilities from a new standpoint, and inquire whether all this long washing is a real necessity or not. He has, further, looked with suspicious eyes upon the various new printing papers offered to him when he learnt—whether by hearsay or by practical trials matters not—that twelve or eighteen hours' soaking in water would spoil the best P.O.P. print ever done, with the frequent result of adhering to his old paper, his old formulæ, his old modes.

But the great frost came, and, as we said, he had to think it all out. We are as conservative in our own practice as any of our readers; but that does not prevent us adopting any or every change that promises with no uncertain voice to be an improvement. We are ready to admit that those large establishments where long washing is the rule never regret it where permanency is the question; but, contrariwise, it must also be granted that such prolonged soaking has been undoubtedly shown to be frequently injurious to the appearance of the prints. Then, again, printing out papers will not permit this long-continued washing. And, finally, we have the lessons, or, rather, the commands of the frost king before us.

We are now face to face with the problem whether prints can be considered permanent if washed for a brief period. Needless to say, questions of permanency can only be settled by time; but, apart from that consideration, we cannot but say that the most valuable experiments of Messrs. Haddon and Grundy on this point, freely given to the photographic world last year, are about as conclusive as it is possible for such work to be in connexion with science vaticination. It is not on account of space desirable to give the details here, the whole paper should be read with its tabulated results in its entirety. As good a case as possible is established for short washing in a few complete changes of water.

The only drawback is that, while a good washing machine is automatic, short washing, to be efficient, must be carefully done, and the future condition of the prints depends entirely on the care, or the want of it, they receive at the hands of, perhaps, subordinate workers to whom such "unimportant drudgery" is likely to be relegated.

One word on a further aspect of this question. We have lately heard of a new "hypo" eliminator. Now, if there is one point more than another on which we have raised a voice of warning, it is with regard to "hypo eliminators;" and we urge our readers not to think one moment of them as substitutes for washing. The object of washing is not primarily to get rid of "hypo," but to get rid of the silver salts with which the "hypo" becomes charged during the operation of fixing. We cannot have the one without the other; but, by getting rid of one by suitable—this word is important—washing, we get rid of the other. But if we get rid of the least important salt, the "hypo," by an eliminator, we adopt the best means possible for keeping the other, the objectionable silver salt, behind, to work future, if not present, irremediable evil.

Lectures on Development.—On Mondays, March 11 and 18, 1895, at eight p.m., two experimentally illustrated lectures will be delivered upon *The Physics and Chemistry of Development*, by Mr. Thomas Bolas, F.I.C., F.C.S., at the Cordwainers' Hall, No. 7, Cannon-street, E.C. (by kind permission of the Worshipful Company of Cordwainers). The chair will be taken by Sir H. Trueman Wood, M.A., President of the Royal Photographic Society. The following

is the Syllabus: Lecture I.—Physical and Chemical Action of Light. Stability of so-called Photolytes (*e.g.* Silver Chloride) in light. Fundamental differences between Electrolysis, Thermolysis, and Photolysis. Chemical and physical views of the latent image. Photo-chemical bearing of the experiments of Hertz and Lodge. Lecture II.—Various modes of Development—by removal—by addition—by special reaction. Their parallels in extra-photographic operations. Members of affiliated Societies will be admitted by tickets, to be obtained beforehand from the honorary secretaries of their Societies, one shilling the two lectures. Non-members, by tickets obtainable only on application to R. Child Bayley, Secretary, 50, Great Russell-street, Bloomsbury, two shillings and sixpence the two lectures.

Extraordinary Importation of Silver.—Photographers are not so directly interested in the silver market as they used to be when they had to sensitise their own paper and prepare their own plates by the wet-collodion process. Indeed some of the "press-the-button" type of workers seem to be almost unaware that silver plays any part in the art they espouse. A fortnight ago the American liner, *Paris*, delivered to this country about seventeen tons of the metal in bars, while the sister ship, *New York*, landed upwards of twenty-two tons a few days before, making something like forty tons received from America in one week alone. A big importation this. Silver is now being quoted at a phenomenally low price. Recently it was down to 2*s.* 3¼*d.* per ounce. This is not the lowest it has been, because some little time ago it was quoted a farthing less, but on only one day, and then it quickly recovered. But it is the first time that the price has continued so long at the present quotations as it has done during the past few weeks, and with the prospect of its yet becoming lower. At its present price there is less than thirteen pennyworth of silver in half-a-crown. Nitrate of silver is now less than half the price it was only a few years ago. So much the better for the plate-makers and the manufacturers of ready-sensitised papers.

Cutting Prices in Process Work.—The issue of Albums by some of the illustrated and other press has been quite sufficient to demonstrate the extent to which half-tone process work is employed, and the excellence to which it has attained, even if the world were not familiar with it already. As the demand for the work increases, so does competition amongst the producers, and that is no more than what is always to be expected. But we are sorry to see that the present competition is not a healthy one, for it is not in the direction of superiority of work so much as it is in the price for it. Process blocks of good quality are now to be had for about half the price that used to be obtained, say, only a couple of years back. This is to be regretted, as there is, or was, no necessity for it. A shilling or two in the price of a block that, perhaps, yields tens of thousands of impressions is of little moment to the publisher. He cannot, however, be blamed for buying in the cheapest market when it is thrust upon him. What is said with regard to half-tone blocks applies, perhaps, to a greater extent to line-work "zincos;" with them still greater cutting prices rule. Foreign competition is generally charged with bringing about cutting prices, but that is not the case in the present instance. English half-tone blocks are now supplied, as a rule, for lower prices than are charged by Continental houses.

Auro.platinotype Prints.—It is now some time since Mr. A. W. Dollond first brought his system of toning platinum prints with gold before the photographic world, and it would be interesting to learn if the method has received any practical application, and, if so, to what extent. At the meeting of the Photographic Club, a week or two since, that gentleman again demonstrated the process before a good muster of members, and showed its utility, at least in one direction. It is not to be supposed that platinotype workers would specially produce prints to require gold toning afterwards, as that would involve double labour without corresponding advantage; but, as was demonstrated, a platinum print that, from under-printing or insufficient development, would be otherwise useless, could be converted into a very bold and vigorous picture that left nothing to be desired; in fact, a poor faint brown print was transferred into one as black and vigorous as the best platinum picture. The platinum process is not a cheap one to work, and, if otherwise worthless impressions can be turned into excellent results, the method is valuable. During the discussion a question was asked, Seeing nascent chlorine was present during the toning process, did the print contain, in the end, the same quantity that it did in the beginning? Be that as it may, one cannot but assume that an image in platinum *cum* gold is not less permanent than is one in platinum by itself. The case would be widely different if a baser metal, silver, for example, were a factor in the case.

Winter Photography on the Thames.—Residents in the metropolis have, during the past few weeks, had the opportunity of securing photographs such as they, according to the authority of the proverbial oldest inhabitant, have not had before. Between London Bridge and the Charing Cross one, thousands of sea gulls were to be daily seen on the floating ice, or hovering above it, in search of food, or tamely waiting to be fed by onlookers. Under these conditions it was an easy matter to obtain numberless interesting pictures in circumstances that may not occur again for many years to come. It must be confessed that it required some little enthusiasm to turn out with the camera, and await the opportunity, with the mercury standing midway between zero and the freezing point. However, with the hand camera, so much courage was not required, and many were brought on the work, though, doubtless, the development of the plates was deferred to a more congenial season. Many of our older readers will, doubtless, remember a picture with a sea gull in it, and the controversy there was about it some years ago, in which the terms "gull," "gullible," "gulled," and "gullibility" were used in a very uncomplimentary way. At that period the wet-collodion was the most rapid process in vogue. Now, thanks to the great rapidity of gelatine plates, no question would be raised as to the *bona fides* of any picture containing actual flocks of gulls, even if it were taken, as it might have been, during the greater part of last month, in the very heart of London.

JOTTINGS.

WHAT is a "common or garden" photographer? Where, in fact, does commonness and gardenness in photography commence, and the opposing quality—which it is hard to define, but which might at a push be designated as *un*commonness and *non*-gardenness—leave off, or *vice versâ?* The question is suggested to me by some remarks of Mr. George Davison given in the last number of the *Camera Club Journal*. Captain Abney had read a paper on *A Photograph from an Evolutionary Point of View*, and the discussion took the inevitable "artistic" turn. Here are two sentences from Mr. Davison's speech to which I invite my readers' careful attention: 1. "Artistic photography was simply the method of recording picturesque effects in black and white; *the aim was to express what one felt about any subject.*" 2. "There was one thing that could easily be expressed by figures, and that was the extent of the artistic interest or perception of a normal gathering of 'common or garden photographers.'"

I should like to know how Mr. Davison reconciles these two doctrines, which, I submit, are not in agreement. Let us take his own method of recording picturesque effects in photography, and we shall find that he expresses *his* feelings about his subjects in a fuzzy, diffused, or broad manner of treatment. So far, so good; but, if I interpret his second utterance corrrectly, the "common or garden" photographer, who expresses what *he* feels about any subject by depicting it crisply, clearly, and intelligibly, has no artistic interest or perception; in fact, what is sauce for the fuzzy goose is *not* sauce for the gander of definition. Is not this another illustration of the old saying, Orthodoxy is my doxy, heterodoxy is your doxy? Mr. Davison virtually says that artistic photography is a matter of individual expression; but, when the individual selects some method

of expression conflicting with Mr. Davison's preferences, then he ceases to be an "artist," but becomes a "common or garden" photographer! Hence we are forced to conclude that the answer to the question with which I opened the previous paragraph is that a "common or garden" photographer is one who does not take photographs *à la* Davison. I invite some "common or garden" photographer to give us his appreciation of Mr. Davison's photographic methods.

It is such a contemptuous reference as that made by Mr. Davison to "common or garden" photography, as well as the scornful laugh at "the beachman and the touting photographer," in which Mr. H. P. Robinson somewhat unwisely indulged the other day, which is responsible for the existence of a good deal of retaliatory ridicule directed against the so-called "new movement" and its apostles. That movement, in which all of us must discern much that is capable of exalting photography as a method and medium of pictorial expression, nevertheless, suffers, I think, in the estimation of thoughtful friends of photography, from the increasing arrogance and pretensions of a creature of its own creation. I allude to The Superior Person. Reading between the lines of his now famous article on *Decadents and the Salon*, I fancy that Apoc projected his arrows more directly at Superior (Photographic) Persons as a class than at a comparatively few types. The Superior Person, above all things, is not a photographer—to do him justice, he does not aspire to be; on the other hand, he exhibits every contempt for those who do. To him a photographer may be a man, but he is not a brother. All the worst affectations of the fifth-rate artist, whose vanity and hollow assumptions constitute his principal stock in trade, are concentrated in the Superior (Photographic) Person. And, if I wrote for a yard, I don't think I could give a description which so thoroughly crystallises his vices. I will therefore leave him to the contemplation of my reader, merely adding, as a final lament, that the Superior Person evinces a desire to throw off the shackles of amateurism with which he has hitherto been bound, and is invading the professional ranks.

Snow photographs in large numbers are the outcome of the Arctic weather we have had and are having. I have seen a good many of these productions, and was much struck with some, produced not by daylight but by moonlight. A friend sends me two snow *cum* moonlight views of a country village in which he resides. The houses are close up and the shadows are very deep; nevertheless, in one case, at *f*-16 with an hour's exposure on a very rapid plate, and in the other an hour and a half at *f*-11·25 on a plate of medium speed he produced exceedingly well-exposed results, the non-halated lights in the windows and the effect of the glistening snow producing a signally realistic result. Another moonlight-snow picture I saw represented an open view with a cottage in the middle distance. This had an exposure, at *f*-8, on one of the most rapid plates, of a *quarter of an hour* only. The result, which was photographically excellent, might easily have been mistaken for a view taken by daylight.

That restless and hysterical publication, the *Daily Chronicle*, which is continually carping at the quality and inappositiveness of photographically reproduced illustrations, for the last week or two, *àpropos* of the London County Council election, has been appearing as an illustrated daily, not, I venture to suggest, with the happiest effects. It has had a lot to say about "new" London, which, according to it, has been created by the now extinct Progressive majority during the last three years, and it has been so hard pressed for illustrations that it has had to fall back on views of Waterloo and Vauxhall Bridges, music-hall scenes, and so forth. If we are to have illustrations in other morning papers besides the *Daily Graphic*, it is at least desirable that they should be both apposite and up to date. Some of the *Chronicle's* illustrations by the way were, doubtless, highly "artistic," but to the trained eye of the photographer they must have seemed sadly out in perspective and drawing.

A new stage in the always simmering controversy created by the Hurter & Driffield theory of plate-speed determination has been reached by the tardy admission that the speed and density ratios of a plate vary with the particular developer employed. This, I fancy, has always been the contention of practical photographers, and it is satisfactory at last to find that it is no longer seriously disputed. As to the influence of the developer upon the speed of a plate, I will narrate a little experience of my own which may not be uninstructive in this connexion. In a binocular camera, some months ago, I exposed two plates side by side. One plate was from a box marked, say, 30 H. & D.; the other from a box marked, say, 150. These are not the precise figures, but the ratio of rapidities was as 1:5. Identical exposure, by means of a double-flap shutter, was given the two plates. On development with pyro-soda (Wratten's formula), the negatives, which were fully exposed, were qualitatively undistinguishable. The negatives were printed side by side in one frame on one sheet of paper, and the prints, toned and fixed together, and mounted side by side stereoscopically, were also identical in general appearance. The moral is, I suppose, that, to get the maximum speed of a plate, we must employ the particular developer to which it has been speeded; but I should not be surprised if it took a long time to force this fact home to photographers generally.

Much obliged to the Hackney Society for kindly inviting me to take part in their Easter Continental trip. Mr. Beckett's intinerary makes my mouth water and almost converts my camera into a sentient thing with a wild longing to be amongst those Italian lakes. There is only one obstacle to my acceptance of the invitation, and that is the "quite nominal" figure of twelve guineas for the trip. "Quite nominal!" quotha! My word, things are tolerably flourishing out Hackney way, I should think. I wonder if there are any houses to let in that auriferous neighbourhood?

Bearing the postmark "Guildford," but affording no other information as to the identity of the sender, an envelope, containing a cutting from a contemporary, has reached me. It refers to a mysterious meeting, in the neighbourhood of Covent Garden, of two individuals, "one bearded and of almost Oriental sallowness, the other taller, of more powerful build, and a somewhat athletic carriage;" and the paragraph hints that the object of the meeting was to plot the annihilation of "Zoilus." The last-named incomparable ornament of the fourth estate is the authority for this farrago of twaddle. I don't know what interest in this matter my unknown correspondent conceives me to feel, but I will just observe that "Zoilus" must have an uncommonly good conceit of himself to think, or even to imagine, that any two sane individuals, bearded, athletic, or otherwise, would waste time in the supererogative work of annihilating an object already reduced to irremediable pulverulence, or care a microscopical fraction of an itinerant whitesmith's imprecation for him, or what he says or does.

Reverting to the article *Decadents and the Salon*, a friend sends me a quotation from the writings of one of the psychologists named by Apoc, which he says that gentleman probably had in mind when penning the article. I append the quotation, leaving my readers to decide for themselves how far modern literary and artistic Degeneracy and Linked Ringism may be parallelised:—"The movement . . . . is an incomparable example of the tendency to form cliques which I described. It began by a foundation in due form. A man arrogated to himself the rank of captain, and enrolled armed companies. The purpose is the same as that of any band of criminals. . . . . Membership is acquired by formal admission after predetermined tests have been undergone. They must first publicly bespatter a well-known and meritorious author with mud. With the predominance of low and bad emotions in members of the band, they experience more gratification in maligning a man they envy than in being praised themselves. Next, the candidate must worship as geniuses one or more members of the band. . . . . Having undergone these ordeals with success, he is received into the band and declared a genius. . . . . The band provides its appointed editors, and exacts understandings with critics of respectable papers. Its influence ex-

tends even to foreign countries. . . . . These are *linked* together by a sympathy of interest and hatred; they form a kind of freemasonry. . . . . It is founded on the need of resistance to ridicule. . . . . In spite of hating each other, they stand firmly by one another to combat their natural antitheses—the men of genius."

I fear my Biblical knowledge is getting rather rusty, but I remember that particular passage of the New Testament which treats of the ten lepers. These gentry were cured and made clean; but only one had the grace to return thanks. As it was 2000 years ago, so it is to-day—in photography. I notice from the balance-sheet of the Photographers' Benevolent Association that last year the donations and contributions from photographers amounted to a miserably small sum; that over 140*l.* was expended in grants and loans, and that there was one solitary repayment of "Five Shillings!" "Where are the nine?"—where are the men and women of past years whom the "Benevolent" has helped to set on their legs with gifts and loans, some of whom, to my certain knowledge, are now earning more or less good livings and yet haven't the common gratitude to pay back a single penny for the benefit of others? And it is for such shameless ingrates as these that another effort is to be made, by the untiring and kindly men who have administered the "Benevolent" for the last few years, to save that institution from threatened extinction!

COSMOS.

THE SCREEN AND ITS EFFECT.

THE question raised by Mr. W. K. Burton, and further discussed a fortnight ago by Mr. Edwin C. Middleton, as to the effect of the screen in photo-mechanical printing, is one of the very greatest interest at the present day, and well worthy of thorough investigation. The latter gentleman has treated the subject in a thoroughly practical manner, and makes the first allusion I have ever seen in print to an influence that appears to have been hitherto almost, if not entirely, ignored, namely, the effect of vignetting. As Mr. Middleton points out, the "dots," if examined closely, consist of an opaque centre surrounded by a halo, and, by varying the time of printing, the size of the dot can be varied according to the length of exposure.

In the use of the screen it seems indisputable that there are two entirely distinct effects produced, namely, the one in which the apertures in the screen itself act as lenses or "pinholes," forming a series of images of the stop; and the other, in which the blurring or want of sharpness of the edges of the dots, whatever their shape, introduces the vignetting element. How far the two influences work together in the ordinary modern method of using the screen I have not had sufficient practical experience to say, but the half-tone effect may be obtained by means of the latter effect alone, and entirely without the aid of the camera; but, personally, I am inclined to think that the half-tone is almost completely due in one way or other to this effect.

So far as the screen itself is concerned, and throwing in the influence of the stop, it is only capable of forming a series of dots of a perfectly uniform character. That is to say, by varying the size and shape of the stop, or the distance of the screen from the sensitive surface, it is possible to vary the size, shape, and sharpness of the individual dots; but, if an exposure be made to an evenly illuminated surface, or without the intervention of a negative, the dots will, under any particular conditions of size of stop and distance of screen, be absolutely uniform in shape, size, and density. By varying the exposure, the size will be altered, as will also, probably, be the density, but the variations in these respects will still be uniform over the whole plate.

But, when the exposure is made to any object having an unevenly illuminated surface—to a picture or object of any description whatever, in fact—then the screen commences to exhibit a "selective" power, and produces dots still showing uniformity of shape, but varying both in size and density, according to the amount of light passing through the different portions of the screen. The variation in size in different portions of the subject cannot be due to any selective action on the part of the stop, but solely to the vignetting effect already alluded to. The *rationale* of the action will be better understood if the following experiment be made:—

Let a circular photometer screen be constructed by dividing a circle into eight parts or sections by radial lines, and let each of the divisions be made up of different thicknesses of tissue paper, from one to eight. Let this screen be placed in a printing frame, with a piece of sensitive paper behind it, and over the front of the frame let a sheet of opaque paper be stretched at a distance of, say, half an inch, with a small circular aperture in the centre, to represent, on an enlarged scale, one of the apertures in the crossed screen. Let this arrangement be now exposed to soft diffused daylight, as if it were an ordinary vignette portrait, and as in that case the effect will be improved if the outer aperture be covered with tissue paper or ground glass and the frame be exposed upon a rotating table.

If now the sensitive paper be examined from time to time, it will be found that first of all the section covered by only one thickness of tissue will make its appearance, followed in turn by each of the others. But it will be remarked that, as each successive division becomes visible, its predecessor will not only be darker in tint, but will extend to a greater distance from the centre; in other words, will represent a section of a larger "dot."

Another experiment will show the idea in perhaps an even clearer light. In front of a graduated photometer screen fix in a similar manner a piece of opaque card or metal pierced with a number of minute pinholes of the same size, and let one or more of these apertures fall on the different grades of the screen. In this case, the distance between the cardboard and the sensitive surface should be much reduced; in fact, it may be laid in contact with the glass of the printing frame, with only the thickness of the plate intervening. As in the previous experiment, there will be a very decided difference, both in size and density of the dots, according to the amount of light passing through the graduated screen.

The light that passes through the apertures in either case, by the time it reaches the graduated screen, has spread over an area considerably wider than the actual aperture, but the degree of illumination at the margin of this area is considerably weaker than in the centre, consequently the centre is impressed first, and with any given "tint" of the scale, as the exposure is prolonged, so the visible impression spreads, and, as a matter of course, with any given exposure, the more translucent grades give proportionately larger dots.

Reverting to the screen as employed in front of the plate in making a half-tone negative, the distance between the screen and the sensitive surface causes a certain amount of diffusion, and a corresponding softening of the edges of the dots; or, if we choose to look upon the aperture in the screen as performing the function of so many lenses, we may set this softening down to want of sharpness of the image given by the stop; but, however caused, it is the vignetting effect of this halo in the different grades of the subject that gives the variation in the size and density of the resulting dots.

Of course, the degree to which this vignetting influence is visible is much less in a camera image than it is in one produced in the printing frame, as described above, owing to the much greater degree of diffusion of the light in the latter case. If the printing-frame exposures be made from the bottom of a long tube or deep box, or at a distance from a window, the result will be more in accordance with that produced in the camera, but in all cases the principle is the same.

That the value of this vignetting effect was in a manner recognised as far back as ten or twelve years ago is proved by some of the devices then adopted with the screen in contact with the plate. One of these consisted in moving the screen, after a portion of the exposure had been made, through a distance equal to a portion only of the width of the dot, by which means a dot was produced varying in opacity at the centre and margin respectively. If I mistake not, it was Mr. F. E. Ives who originally devised this method of producing a vignette dot.

Although, perhaps, the results may not be equal to those produced by the modern screen and methods of using it, it is quite possible to obtain half-tone negatives in the printing frame by reproduction, or direct in the camera with the screen in contact with the plate. In

fact, if the same amount of care were exercised in the preparation of a vignetted dot screen as has been applied to adjusting the size of stop and distance of screen from the plate in the regular process, there does not appear to be any reason why the one plan should not be as good as the other. Indeed, if a sufficiently accurate gradation of the dots could be obtained by photographic means, the vignette screen would seem, in some respects, to offer advantages over the other.

The matter is one that need not prove very difficult to test by those who have the means and appliances at hand. For instance, under the usual condition of working, as regards size of stop and distance of screen, let a plate be tinted evenly by exposure to an even surface of white paper. This would give a series of vignetted or graduated dots, such as I have already referred to. If from this a reproduction or reverse were made on a collodion emulsion film, we should soon have a screen in which the necessity for regulating the size of stop or the distance between screens and plate are eliminated, and, in fact, the necessity for the camera in making a reproduction would be done away with.

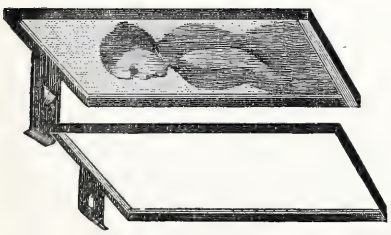
Landscape or portrait negatives could be taken direct, the screen in contact with the plate, without any necessity for studying, except so far as the exigencies of the subject itself required it, the size of stop; or, in the form of a stripped film, the screen could be interposed between an ordinary negative and the sensitive surface upon which the image to be etched is to be produced, and a similar, if not an identical, result to that produced in the present way in the camera would be gained.

These latter suggestions are by no means visionary, as, some years ago, proceeding on these lines, but with very imperfect appliances, I succeeded in producing some very promising results. With better original screens—for, after all, we must fall back on the ruled screen to start with—there is a hope that a correspondingly improved result may be arrived at at the present time. W. B. Bolton.

Our Editorial Table.

Combined Film and Plate-holder.

By Henry Park.



Mr. Park has sent us a sample of this holder, which is shown in the cut. The advantages claimed are that any film can be held flat during development, or, by removing the top frame, the bottom one can be used for plates, so as to prevent the fingers being stained. A patent has been applied for.

Photographic Mosaics.

New York: E. L. Wilson.

This work, which is usually issued with the Annuals at the end of the year, is this year somewhat later than hitherto. But "better late than never," for the volume contains much useful reading, and is embellished with many quarter-plate portrait studies. A large portion is occupied by a review of the last year's work, the remainder consisting of articles written for the book. *Mosaics* is now in its thirty-first year.

Hesekiel's Grain Bromide Paper.

C. A. Rudowsky, 3, Guildhall-chambers, E.C.

Mr. Rudowsky has submitted to us several specimen prints on this paper which are characterised by great brilliancy and softness. The grain imparts to the print the effect of an exceedingly good impression from a half-tone block. We have also tried the paper, which is manipulated in precisely the same manner as bromide paper. It is worthy of note that the ferrous-oxalate developer is recommended for it.

Burton's Modern Photography. (Eleventh Edition.)

London: Carter & Co, 5, Furnival-street, E.C.

The fact of this book going through so many editions speaks for the appreciation with which it is regarded. So rapid is the growth of photography, and so numerous are the changes that are taking place in its practice, that only a short time has elapsed since the book was nearly entirely rewritten; and this course has, in some measure, been adopted with this new edition, by which it is brought up to date. Professor W. K. Burton knows what to write about and how to do it. Price 1*s*.

Developers and Developing.

This *brochure*, written by Dr. Thresh, President of the Leeds Camera Club, is issued as No. 5 of *Vevers' Photographic Primers*. Its object, as stated in the opening paragraph, is "to place in the hands of the untutored amateur a clear and concise treatise on the theory of development and the methods of using the various developers which are at present in use." It certainly fulfils its objects. The young reader obtains in it much information comprised in a nutshell.

Jonathan Fallowfield's Stock-taking Sale List.

This, as deducible from the title, is a bargain list of goods of various kinds to be cleared away so as to make room for the constantly recurring increase of novelties in stock. The quantity and variety of really useful photographic goods here listed is simply enormous.

News and Notes.

Royal Photographic Society.—Ordinary Meeting, March 12, at eight p.m., at 50, Great Russell-street, W.C. *An Unconsidered Property of Photographic Lenses*, by Mr. T. R. Dallmeyer.

Mr. Oscar Scholzig, of Dashwood House, 75, Old Broad-street, E.C., informs us that he has taken over the following sale agencies:—The Beernaert dry plates, C. P. Goerz's double anastigmat lenses, and Dr. Andressen's developers—rodinal, eikonogen, amidol, metol, glycin, hydroquinone, pyro in bulk and cartridges, and also tone-fixing cartridges.

On February 27, at 17, Upper-street, Islington, N., occurred the death of Mr. William W. Drinkwater, photographer. Some thirty-six years ago he entered into indentures with Mr. Pickering, of Birmingham. Afterwards he served R. W. Thrupp & Co., of the same town, and seven years followed with W. Heath & Co., of Plymouth. In October, 1873, he was first associated with Mr. T. C. Turner, being managing operator at the Barnsbury-park establishment for four years. He then proceeded to Hull, where he remained ten years as managing partner. Afterwards he renewed his connexion with the London establishment, taking charge of the branch at Upper-street, Islington, from 1887 till his death, with the exception of a short intervening period spent in Ireland.

The Eastman Photographic Materials Company, Ltd., held their Annual Meeting at their own premises, 117, Oxford-street, London, on March 5. It was announced that Mr. Andrew Pringle was unfortunately ill with influenza. Mr. George Dickman, the Managing Director, took the chair. A dividend of two-and-a-half per cent. on the preference shares was declared, and a balance of 319*l*. 19*s*. 6*d*. was carried forward. It appeared, from the remarks of the chairman, that the Company is now in a most healthy condition, having written off old matters that for two years have taken part of the profits of the company; for instance, matters on the balance sheet brought from 1892 and the closing of old law suits of 1891 and 1892, had taken the amount of 9039*l*. from the profits of the company in 1893 and 1894, otherwise the company could, in those years, have paid a dividend of ten per cent. on the preference shares, and one per cent. on the ordinary. It was mentioned that the profit and loss expenses and the percentages of salaries had decreased, although the sales were greater than before. Kodaks and kodets and new cameras in the factory not yet on the market, were likely to increase the business still further in the future. A hearty vote of thanks was passed to the directors for their efforts during the year, and we congratulate the Company on its healthy condition and organization at the present moment.

The North Middlesex Photographic Society's Annual Dinner was held at the Holborn Restaurant, on Saturday, March 2, when some sixty members and friends assembled under the genial chairmanship of the President of the Society, Mr. J. W. Marchant. The repast was an excellent one, and the toast list commendably brief. It comprised "The Queen," "The North Middlesex Photographic Society," proposed by Mr. E. J. Wall, and acknowledged in an appreciative and humorous fashion by Mr. Marchant; "The Officers," given by Mr. R. Child Bayley, and spoken to by Mr. C. Beadle (Vice-President), Mr. H. Smith (Treasurer), and Mr. J. H. Avery (Hon. Secretary). Mr. J. Macintosh proposed "The Press," and Mr. J. Traill Taylor, Mr. Wall, Mr. Bedding, and Mr. Snowden Ward responded, Mr. W. E. Debenham replying for "The Visitors." The "Amity Glee Singers" enlivened the proceedings with some excellently rendered glees and part songs, Mr. E. R. Mattocks sang some funny ditties, and Mr. W. B. Goodwin obliged on the pianoforte. During the evening Mr. Traill Taylor presented the certificates awarded at the Society's recent Exhibition, and the late Hon. Secretary, Mr. George Gosling, was the re-

cipient of a handsome camera, three slides, and a lens, presented to him by the members as a mark of appreciation of his services for two years. The dinner was exceedingly pleasant and agreeable throughout, the Society coming in for repeated congratulations at the high level of technical and artistic success it has reached. May it continue to flourish!

MESSRS. MARION & Co. write: "We send you a copy of a letter we have just received from the American Photographic Stock Company, of Hanley, and, as it relates to the keeping qualities of plates—a subject which has been much discussed—we think this letter may be of interest to many of your readers—'Hanley, Staffs.—Batch 1618, size 7½ × 5, Messrs. Marion & Co.—Gentlemen,—Some few years since I purchased the photographic stock of two dealers of this town, Messrs.——. Amongst the plates was an odd box of the above batch and size, but I don't know from which of the gentlemen I purchased them. Can you give me the date of their manufacture [made 1888]. I may mention that this box of plates has occupied many positions in my stores, sometimes damp, at others amongst gases of various kinds. They were not considered worth any attention. Last week one of my assistants desired to try a stereo camera, holding plates 6¾ × 3¼, and these plates (first referred to) were cut up (four only) to suit the stereo size, and, to my astonishment, the negatives came out almost perfect.—I am, gentlemen, yours truly, THE AMERICAN PHOTOGRAPHIC STOCK COMPANY. P.S.—The reason that so little attention was paid to this box of plates was that the label and outside covering were so dirty as to be almost illegible, and the sizes almost uncalled for.'"

ALGERIAN PHOTOGRAPHIC EXHIBITION.—The third annual Exhibition took place on the terrace of the Grand Hotel St. George, Mustapha, Algiers, on February 21. On this occasion, the proprietor of the hotel, Mr. Guiachain, surpassed himself with his floral display of bunting and entertainment. The exhibits were numerous, principally by amateurs, a few professionals being represented. The "lion" of the meeting was Louis Ducos du Hauron, who made a grand display of his large "Anaglyphes." Amongst the lady exhibitors, Mrs. Wrigley exhibited some fine landscapes; Miss C. Acland Troyte showed twenty-eight photographs of Devon, San Remo, and Algiers, for sale for the organ fund of Huntsham Church, very creditable productions, considering her short initiation. Mr. Bradley's contributions, seven landscapes, large, of a fine sepia tone; Messrs. Bevan and Dickenson (Platinotypes), very meritorious, and many other exhibits too numerous to mention. The dealers were represented by Mr. Noter and Mr. Kreuttler; the former showed a panorama of Mecca; the originals were taken with an "Inmelle" Camera; also a quantity of apparatus. Mr. A. L. Henderson's exhibits consisted of upwards of 200 lantern slides, also some flashlight interiors of Tombeau de la Crétienne, and Mosque Sidi Abderrahman. As the day advanced, the visitors were entertained by Indian jugglers, and a camel was at the services of the younger members, but notice was taken that the elders availed themselves freely, probably with the view of being snap-shot. The strains of music was too tempting for the frolicsome to resist an exhibition of the "light fantastic;" all this added brilliancy to the scene. The refreshment department was ably superintended by the manager of the hotel, Hans Seiler. One remarkable feature of the Exhibition was that it took place in the open air, with the thermometer registering 70° in the shade—a contrast to the English weather.

WE are informed that the "Great International Prize Competition and Summer Photographic Exhibition," to be held at the Agricultural Hall from June 29 to July 6 next, is now fairly launched. There will be two distinct competitions, one under the Conference rules, with A. Horsley Hinton, Rev. F. C. Lambert, and H. P. Robinson as Judges (whose names will appear on the prospectus), in which the classes are as follows:—1, Landscape; 2, Seascape; 3, Hand-camera Work; 4, Figure Studies and *Genre;* 5, Beginners; 6, Ladies' Work; 7, Animal Study; 8, Smoking Picture; 9, Architecture; 10, Scientific Work; 11, Instantaneous and Snap Shot; 12, Process Work; 13, Society Competition. Gold, silver, and bronze medals are offered in classes 1 to 4, and silver and bronze medals in classes 5 to 12. The prize for class 13 is an optical lantern. The judging in classes 1 to 8 and No. 13 will be from the artistic standpoint, in classes 9 to 12 other matters will be taken into consideration. The prints need not be framed, and the entrance fee is 1*s.* per print up to a mount or frame of twenty inches, above that 2*s.* per print. The second series of competitions are for amateurs only, who have not previously gained medals or prizes at a photographic exhibition. The Judges' names will be announced later. The classes in this are Landscape, Marine, Portraiture, Architecture and Buildings, Holiday Work (set of six), and Snap Shots (set of six). In this competition the winning pictures (and perhaps a selection from the others) will only be hung. Silver and bronze medals, hand cameras by the Eastman Company, Adams & Co., and the Vedette Company are offered. The Eastman Company also offer 3*l.* 3*s.* and 2*l.* 2*s.* respectively for each first and second prizes upon Solio or platino-bromide paper, and Cadett & Neall offer prizes for work upon the Cadett plates. The entrance fees and most other details are the same as for other competitions. A somewhat novel feature of the Exhibition generally is the fact that *Black and White* will publish a special eight-page supplement with their issue of June 29, illustrated by reproductions of some of the prize pictures, and paying for them at the rate of half a guinea to two guineas, according to the size of the reproduction. The Exhibition is being well received upon the Continent, and editors of foreign papers are becoming agents to receive and dispatch competition prints. Work is expected from Australia, New Zealand, South Africa, Japan, America, India, &c., as well as the Continent generally. Prospectuses, &c., may be obtained from Walter D. Welford, general manager, 59 and 60, Chancery-lane, W.C.

IMPERIAL INSTITUTE.—The fourth lecture in connexion with the special exhibition of photography to be held at the Imperial Institute during the summer was delivered here last evening by Mr. Andrew Pringle. It was entitled *The Reproduction by Photography of the Microscopic Image.* The lecturer began by pointing out that, whatever the opinions might be with regard to photography as an art, and his own opinion was that it could not be considered perfect in that respect, as a recording device it was probably as nearly perfect as might be. In the title given to his lecture a great many words were used, but the word generally employed for this branch of science was photo-micrography. To astronomy photography had rendered the very greatest service, because it had revealed things absolutely unseen and not seeable by the human eye; but he did not make any such claim for photography as applied to the microscope, because he believed that everything which had been revealed by photography combined with the microscope could be seen, and had been seen, in the microscope alone. He then proceeded to describe the general system of apparatus required for photo-micrography. He dwelt upon the necessity for absolute freedom from tremor, and said that, if there was any vibration at all of the apparatus, it must be synchronous. He described the two leading systems as horizontal and vertical, and showed examples of each, going into the advantages of each system. Particular attention was given to the new vertical apparatus specially designed and adapted for rapid work and watching the various organisms. He then proceeded to describe the advantages derived from late investigations into certain optical matters, particularly with regard to the manufacture of glass, culminating in the production of the series of objectives known as apochromatic. Next he reviewed improvements made in photographic plates in the direction of rendering them sensitive to special colour, illustrating this with examples, and then speaking of high numerical aperture in microscope objectives, with examples. Then followed a long series of photo-micrographs, taken at low power and easy work, and advancing to the highest points of difficulty. A large selection of important micro-organisms was shown on the screen, and, in conclusion, the lecturer insisted upon the value of photo-micrography as proof of certain facts, as an educational agent, as a *permanent* method of recording, and in general as an easy, cheap method capable of being reproduced to any extent. He also spoke of photo-micrography as a hobby which might be followed by those wishing for an intellectual hobby, remarking that the expense and the exigency of the work were such that there was not much fear of the *profanum vulgus* entering largely into the field. In conclusion, he warned his audience that for the best results the photo-micrographist must be a microscopist and an experienced photographer.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—The Annual General Meeting was held at the rooms of the Royal Photographic Society on Thursday, February 28, Mr. A. Mackie in the chair.—The minutes of the last general meeting were read and confirmed, and the SECRETARY then read the report of the Council, which was accepted with but little discussion. The TREASURER (Mr. John Spiller) introduced the balance-sheet, and said that it was with great regret that he reported that, although the calls upon the Association had been most carefully considered, and the grants and loans kept down to the least possible amount, the income of the Association for the past year had been quite inadequate to meet the demand. The income had been 51*l.* 5*s.* 10*d.*, and the expenditure 141*l.* 19*s.* Since the beginning of the year the demands upon the funds had continued, and he regretted to have to inform the members that every penny of the Association's money had been expended, and that there were still applications before them which they had not been able to deal with for want of funds. Mr. Spiller then moved the adoption of the balance-sheet. This was seconded by Mr. E. W. Parfitt, and carried. The election of the Committee for the ensuing year then followed, and resulted as under:—*President:* Mr. G. Mason.—*Trustees:* Captain W. de W. Abney, C.B., and Mr. W. S. Bird.—*Committee:* Messrs. R. Child Bayley, R. Beckett, F. H. Berry, C. Faulkner, T. E. Freshwater, G. T. Harris, H. R. Hume, P. G. Hunt, W. Fenton-Jones, A. Mackie, E. W. Parfitt, H. C. Rapson, J. S. Rolph, F. H. Smith, W. E. Ward.—*Hon. Solicitor:* Mr. G. F. Fall, 6, Portman-square, W.—*Treasurer:* Mr. J. Spiller, F.I.C., F.C.—*Hon. Secretary:* Mr. H. Snowden Ward, 6, Farringdon-avenue, E.C. The Auditors who served last year—namely, Messrs. T. Bedding and J. Guardia—were re-elected, and the meeting closed with votes of thanks to the auditors, the Hon. Solicitor, the photographic press, and the officers, and a special vote of thanks to the Royal Photographic Society for the use of their rooms.

Council Meeting.—The first application was for a loan towards purchasing by trustees for the use of his wife and son, a business of a photographer's who was ordered to leave the country on account of his health. As the matter was urgent, it was decided to advance 25*l.* towards a special fund to be raised for this purpose, on condition that the business be assigned to Sub-committee consisting of Mr. Thomas Fall and the Hon. Secretary in trust for the applicant. The Secretary was also instructed to write several gentlemen who are believed to be interested in the case with a view to their subscribing to the special fund. Second application was from an aged and blind photographer whose family is only partially able to support him and who was assisted by the Association some eighteen months ago. Ejectment in default of payment of rent was threatened. The Secretary was instructed to send a small sum immediately, and to ask exact particulars of the position of the family. An appeal from a photographer now in hospital, who has entirely lost the use of his legs and left arm from paralysis and who is a widower, and who has five children under the age of nine years, was very carefully discussed. The applicant thought he might be able to earn a living by retouching. The medical opinion in the case said that his health was so shattered that even such work as retouching he would be unable to work more than a few hours daily, and after lengthy consideration the Committee decided that its funds would not allow it to adequately deal with the case. Letters were read from several persons who had been assisted, and who reported that their prospects were decidedly improving, and expressed a hope of being able to repay their loans during the coming summer.

WHEN one reads in instructions for half-tone, "Put in a square stop," the natural problem presents itself, "How shall we make a square equal the area of a circle?" Here is a wrinkle, not generally known, how to do this. Pass a sharp pencil round the circular opening of an ordinary diaphragm, and within the circle thus obtained plot out a square. It is obvious that such an opening would be much less in area, but by taking the diameter of the circular opening and dividing it into thirty-five equal parts, and making the sides of the square equal to thirty-one of these parts, the difference in the area will be next to nothing.—*Process Work.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
11	Camera Club	
11	Lantern Society	
11	Norfolk and Norwich	
11	North Middlesex	Demonstration on *Platinum-toned Solio Paper* by Mr. Ramsay, of the Eastman Company.
11	Putney	
11	Richmond	*Toning Gelatino-chloride Paper.* Mr. Cembrano.
12	Birmingham Photo. Society	
12	Bournemouth	*Photographic Makeshifts.* P. H. Price.
12	Brixton and Clapham	Closing date for Exhibition Entries.
12	Hackney	*Evening Work.* W. Fenton-Jones.
12	Halifax Camera Club	*Printing, and what can be done with it.* T. Illingworth.
12	Manchester Amateur	
12	Newcastle-on-Tyne & N. Counties	
12	Paisley	
12	Rochester	
12	Royal Photographic Society	*An Unconsidered Property of Photographic Lenses.* T. R. Dallmeyer.
12	Stockton	
13	Croydon Camera Club	Lantern Night.
13	Ipswich and Suffolk	
13	Leytonstone	
13	Midland	*Lenses.* R. J. Bailey.
13	Photographic Club	Members' Open Night.
13	Stockport	
14	Ashton-under-Lyne	Exhibition of Members' Lantern Slides.
14	Birkenhead Photo. Asso.	
14	Camera Club	
14	Cheltenham	
14	Ealing	*Stereoscopic Notes.* Thomas Bedding.
14	Glossop Dale	
14	Hull	
14	Leicester and Leicestershire	
14	Liverpool Amateur	Sale by Auction of Photo. Apparatus.
14	London and Provincial	Lantern Entertainment, Members' Slides.
14	Manchester Photo. Society	
14	Oldham	
14	Southport	*The Working of Bromide Paper.*
14	West London	*A Chat on Saturators.* Mr. Horton.
14	Woolwich Photo. Society	Public Lantern Night
15	Cardiff	
15	Croydon Microscopical	
15	Holborn	
15	Leamington	
15	Leigh	Lantern Evening.
15	Maidstone	
15	North Kent	
16	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

FEBRUARY 28,—Mr. E J. Wall in the chair.

The evening was devoted to the adjourned discussion on that part of Professor W. K. Burton's recent paper relating to the use and action of the ruled screen in half-tone negative work.

Mr. W. T. Wilkinson showed on the lantern screen a series of half-tone negatives produced with differently shaped diaphragms, illustrating the effect of the diaphragm on the shape of the dot.

Mr. A. HADDON showed a number of slides. These were produced in the following manner:—A diaphragm was placed in front of a Welsbach lamp, parallel to which was the screen on a microscope stage. The objective was focussed sharply on the screen, and drawn away for the fifth of an inch, the magnified image being thus received in the camera. Triangular, square, and slot-shaped openings, parallel to and at an angle with the lines, were used. The effect of interference was produced by increasing the distance between the objective and the grating. At a certain distance the dots appeared to take the shape of the diaphragm, while further off a certain amount of diffraction set in.

Mrs. CATHERINE WEED WARD showed a number of lantern slides of a ruled screen produced under various modifications of aperture and distance, and read the following short paper on the subject by Mr. H. Snowden Ward :—

"So far as I could follow it, the discussion, which was adjourned to this evening, brought out two distinct statements: 1. That the lens aperture has no effect upon the dot in the screen image; 2. That a negative for half-tone work consisted of dots of equal blackness but unequal size. As both these statements are incorrect, rather from the looseness with which they are made than from their actual opposition to fact, I thought a few slides illustrating the points might be useful, and asked Mrs. Ward to make them. They do not attempt to be photo-mechanical negatives, for they aim at demonstrating nothing beyond the points actually in question. The question of exposure, of course, enters largely into the matter, but I leave that entirely to the copies of the actinometer. The other slides have all had (roughly) the same *equivalent* or actinic value of exposure, the actual time being varied according to the diaphragm used and the varying illuminant (daylight). The screen I used was the coarsest I happen to possess, a Wolfe's screen of 110 lines, and it will be somewhat difficult to show the results on the lantern screen; but probably they will be sufficient for those who are interested in the subject. Slide 1. The first slide is a negative of part of the original screen, made in the enlarging camera to two and a half times the diameter of the original. The next five are views of infinity (or, in other words, a large illuminated ground glass) made with the screen in contact with the plate. The distance from plate to ruling was simply the thickness of the cover glass. The apertures are given in the *f* values calculated on the actual (not the equivalent) focus. The exposures were proportional to the apertures. Slides 2, 3, 4, 5 show very little difference: $2 = f\text{-}72$; $3 = f\text{-}48$; $4 = f\text{-}36$; $5 = f\text{-}29$. No. 6, jumping from f-29 to f-18, shows a very striking result, for it replaces the black dots surrounded with transparent lines with transparent dots surrounded by black and half black lines. This shows that the difference between f-29 and f-18 has a marked effect on the resulting dot, while the difference between f-29 and f-72 is almost immaterial. This result can only be taken as applying to the case in which the screen is at this one particular distance from the plate. This will be well seen in the next two slides, which are negatives of an actinometer. They are both with the same aperture, f-28, but in No. 7 the screen was in contact with the plate, while in No. 8 it was separated by one-tenth of an inch. It will be seen that the result of the separation is similar to the result just obtained by increasing the aperture, and it will be further noted that the result is but little altered by the exposure, for the characteristic differences of dot are seen, whether we examine the almost solid black of No. 1, or the scarcely discernible image in No. 8 of the actinometer scale. One more slide on this point. Slide No. 9. It is again made with the screen in contact, and with the smallest aperture we used, f-72. It shows very clearly, from the blackest to the faintest image, the same character of dot as in the other small-aperture images. These latter slides show clearly the influence of exposure, in modifying the intensity and the size of the dot, but hardly in altering its general character. The next question is that of the relation of *shape* of aperture to character of dot, and on this point I have four slides. The first, slide No. 10, is made with a square aperture, the diagonal of which is f-28, and which was placed with its sides parallel with the sides of the plate. It gives very little apparent difference, except in the transparent squares at the corners of the black dots. Slide No. 11 is made with the same aperture placed with its sides parallel to the lines of the screen. The next two slides are made with a slit aperture f-28 long by f-140 wide. Slide No. 12 has the length of the aperture parallel with the lines of the screen, and fully supports the general experience of practical workers and the statement made by Mr. Calmels, which I was much surprised to find was flatly contradicted by two gentlemen who are supposed to be authorities on the subject. The very powerful effect of the shape of the aperture can be best seen in Nos. 1 to 4 of the actinometer, though it can be less distinctly traced in the fainter numbers. Slide No. 13 is made with the same slit aperture, but this time parallel with the sides, and not with the lines of the screen. The result is peculiar, and can be best seen in No. 2 of the actinometer. It makes the black dot take a roughly hexagonal form, and breaks the white line into a series of dice-box-shaped dots. I need hardly point out now that the statement that the half-tone negative consists of a series of dots, varying in size but not in density, is misleading by reason of its too great sweep. It is true that the ideal half-tone negative would be so, and that the actual negative used in half-tone much more nearly approaches it than the slides I have shown. It would be more correct to say that the resulting half-tone print takes its gradations from dots of equal density but varying size, and that processes leading up to it have that end constantly in view. The whole thing is a series of compromises; at each stage there are opposing factors, and the different items of size and shape of aperture, distance of screen from plate, character of screen, length of exposure, character of plate, development and intensification, time of printing and printing process, time and nature of etching, must all vary, and yet harmonise, if we want perfect blocks of varying subjects."

Mr. P. EVERITT also showed slides of a lamp globe, photographed through a screen with slit, pincushion, and triangular openings. "If," said Mr. Everitt, "the dots were the images of the diaphragm, and the ruled screen acted as so many pinhole cameras, then there ought to be some proportion between the size of the diaphragm and the dot."

Mr. W. GAMBLE showed magnified enlargements of parts of wet and dry-plate negatives. The deduction from the results was that the exposure for the dry plate must be correct to get a good print. He also showed a series of prints the negatives of which had been made with various shaped openings, and quoted Mr. Levy as saying that the greatest vigour was obtained with the square-shaped stop. In colour photography the slot-shaped diaphragm would be very useful. The reason why American work was superior was that they used a finer screen and got a softer effect.

Mr. W. E. DEBENHAM thought that the shape of the dot was simply a question of the distancing of the screen from the plate. With a given stop squares or circles would be produced simply by the distancing of the plate.

The CHAIRMAN asked why, if the shape of the stop was immaterial, Levy had recently patented a stop of peculiar shape—a square, with end pieces top and bottom?

After other remarks the proceedings closed.

PHOTOGRAPHIC CLUB.

FEBRUARY 27,—Mr. J. B. B. Wellington in the chair.

Mr. HORACE WILMER gave a lantern lecture on *Denmark*, illustrated by a considerable number of lantern slides. Characteristic coast, village, and river scenes were depicted, Mr. Wilmer, in a racy and humorous fashion giving the experiences of himself and a companion during a month's sailing tour in Schleswig-Holstein and Denmark proper. He described the Danes as a kindly and hospitable people.

At the close of the lecture, which was much appreciated, Mr. Wilmer was heartily thanked.

MANCHESTER PHOTOGRAPHIC SOCIETY.

LANTERN SECTION.

FEBRUARY 27.—Mr. S. L. COULTHURST gave a lantern entertainment entitled *Amongst the Dutch*. In a racy manner he led his audience, by many varied paths, through the quaint and picturesque portions of Holland, including

Amsterdam, Rotterdam, and numerous other dams. Not only were the chief towns visited, but also many old-world spots, outside the run of the ordinary tourist. The variety of subjects treated indicated that no opportunity had been missed. Many street views, depicting the natives in their every-day life and attire, were specially good, and illustrated in a forcible manner the great advantage of the hand camera for this class of work when in competent hands. The whole was excellent, and at the close of the entertainment, Mr. Coulthurst was complimented upon his successful work.

Mr. W. Tomlinson officiated at the lantern.

Croydon Camera Club.—An unusually crowded meeting took place on Wednesday, 27th ult., to see Mr. D. Waller's demonstration of portraiture by incandescent gaslight, for which he had made elaborate preparation, an installation of Treble's newly devised arrangement of incandescent lamps having been at considerable trouble set up and connected with the house gas supply. The ocular effect of the eight burners on the various members who were experimented upon was very satisfactory. Unfortunately, only an hour or two before the demonstration, Mr. Waller was incapacitated by sudden but acute illness, and at the last moment Mr. G. R. White undertook to test the value of the system by taking members' portraits. This experiment indicated that the light is, although of high luminosity, not of such great actinic power as might be supposed. His most successful portraits were obtained working at *f*·8, using Wratten's drop-shutter plate with an exposure of fifty seconds. The President (Mr. H. Maclean, F.G.S.) showed several unusually fine portraits taken by Mr. Charles Treble with a similar arrangement of lamps as that being experimented with. He also handed round a large number of other portraits taken by various methods of artificial light, including an interesting group of members, illustrating a council meeting, taken in 1892 at the Club by means of an electric flashlight arranged by Mr. G. R. White. The advantage of artificial light over daylight as regards availability was emphasised by the President, and the slowness of many English professionals in using means now at their disposal for quick delivery of work contrasted with some American firms, who actually guarantee to take your portrait in the evening, and deliver a dozen copies by breakfast time next morning! Mr. G. R. White was appointed Hon. Lanternist. On the motion of Mr. Waterall, it was agreed to offer a series of prizes for competition between members during the current year. Mr. Holland's suggestion of initiating a club album was adopted, Mr. Smith undertaking to arrange for its provision free of cost to the Club. A special Lantern Evening on Thursday, the 7th, was arranged in order to inspect a collection of prize slides.

Hackney Photographic Society.—February 26, Mr. L. S. Wilks presiding.—In consequence of the unavoidable absence of Mr. G. D. Sargeant, who was to have given a paper during the course of the evening on *Studios and Dark Rooms*, Mr. S. J. Beckett kindly consented to take the subject. He said that the object of a studio was to have under control the means of modifying the lighting of a subject. A great quantity of light was not necessary; on the contrary, a very little, disposed of in a proper manner, was all that was required. In choosing the position for a studio, the site at disposal would, of course, regulate the choice, but a north or north-east aspect was to be preferred. That form of structure known as a half lean-to was the best. The roof should be strong but light. Care should be taken in choosing the glass, remembering that the clearest glass stopped ten per cent. of light, so samples should be compared, and the whitest chosen. It should not be thinner than thirty-one ounces, in order to lessen the chances of breakage from stones, &c. The length of the studio should not be less than twenty feet, but a convenient size would be thirty feet long, nine to fifteen feet wide, twelve feet to ridge, and eight feet to the eaves. Three feet at each end of the roof might be opaque, the rest glazed and shaded by means of blinds of indigo twill, suspended by rings upon piano wire stretched from end to end. These blinds should be in two parts, and should be so arranged that when stretched to their fullest extent they would shut off all light. The internal walls should be painted a dead grey in flatted oil colour. Concerning dark rooms, Mr. Beckett said that, in the selection, the first point to consider would be the space at disposal. It was very desirable to have a room for the purpose exclusively, however small; but, above all these things, it must be well ventilated. Mr. Beckett then described in detail the desired fittings, &c., for a dark room, giving many useful hints.

North Middlesex Photographic Society.—February 25.—Mr. W. Ethelbert Henry, C.E., gave a practical demonstration on *A Simple Method of Preparing Lantern Slide Emulsion.* In introducing his subject, the demonstrator said there was no necessity for an elaborate outfit of costly appliances in cases where only a small quantity of emulsion was required at a time. The method of preparing an excellent gelatino-chloride emulsion for the purpose of lantern-slide making was simplicity itself, and only necessitated the use of silver nitrate, common table salt, gelatine, and a couple of stoneware bottles, in addition to the graduates and scales in the possession of every photographer. The demonstrator's mode of operating (and he supposed he was speaking especially to a class of photographers who were otherwise engaged during the daytime, was as follows:—In an earthenware bottle such as is used for ginger beer, he put: Tap water, 5 ounces; common salt, 100 grains; hard gelatine, 125 grains. This was usually done at night just before going to bed. In the morning the bottle must be placed in hot water to dissolve the gelatine, and then it must be taken into the dark room and 150 grains of silver nitrate in large crystals added to its contents. The bottle must then be agitated until the contents were thoroughly emulsified (say for five or ten minutes) and then well corked, and the cork covered with a few layers of brown paper, tied securely to exclude all possible rays of light. During the day, the bottle may be left in the fender near the fire in order to thoroughly digest without "settling," and it should be shaken occasionally by some one willing to attend to it. At night it must be turned horizontally and revolved under a stream of cold water in order to induce the emulsion to set around the sides of the bottle. When set, the bottle is to be taken in the dark room, filled with cold water and allowed to stand for half an hour. Several changes of water should be given at intervals of half an hour, and at bedtime the bottle may be finally filled and left overnight, another change in the morning will ensure the thorough washing of emulsion, which will then be ready for coating the same evening. At night (or previous if not engaged during the day) heat the bottle so as to melt the contents, and then filter the emulsion through flannel, cambric, or chamois skin, and then coat clean glass with a moderate thickness, five ounces coating about five dozen plates, lantern size. For drying the plates, should a proper drying cupboard not be at hand, Mr. Henry suggested the use of an old wooden box or trunk, round the sides of which rows of nails should be placed to hold the plates. The box being thoroughly dried, the plates put in when the emulsion has set, the lid then shut down, and the box placed in the dark room. The plates would be found dry in the morning. The exposure of these plates would be, using a negative of fair density, one inch of magnesium ribbon at three feet. Any developer would suit them, the one he used being metol made up as follows:—A. Metol, 400 grains; sodium sulphite, 8 ounces; bromide of potassium, 50 grains; water, 80 ounces. B. Potass carbonate, 8 ounces; Water, 80 ounces. Take 1½ ounces of A to ½ ounce of B. The demonstrator showed all the operations, and described other methods of more rapid preparation, washing, &c. In the discussion that followed the demonstration, Mr. Beadle wanted to know if chloride of calcium could be used to dry the plates. Mr. Henry said, "Yes, certainly." Mr. McIntosh wished to know if the cyanide intensifier would have any effect on the plate? The lecturer said, "No; he himself had the greatest faith in cyanide and iodide." Mr. Child Bayley wished to know if Mr. Henry could form any idea as to the condition of the emulsion from its colour (a light grey) by transmitted light? and was informed that the plates were from four to six times as quick as wet collodion. Remarks were also made by Messrs. Cox, Frost, Gregory, Wall, Treadway, and Marchant. A very hearty vote of thanks to Mr. Henry (to which the name of Mr. Ward was also added) brought the evening's business to a close.

Barrow-in-Furness Naturalist Field Club (Photographic Section).—A lecture was given on Monday evening, February 25, in the Cambridge Hall, under the auspices of the Barrow Naturalist Field Club, by Mr. Harper Gaythorpe, on *The Rare Old City of Chester.* The lecture, which was a most interesting one, was profusely illustrated by some eighty slides, the work of the lecturer's son, Mr. S. B. Gaythorpe, who also projected them on the screen. The slide were admirable, and an enjoyable evening was spent.

Bournemouth Photographic Society.—February 26.—A lecture was given by Mr. H. W. Smith, of the Platinotype Company, on *The Latest Development of Platinotype Printing.* The lecturer commenced by describing the action of the developer on the paper, several prints being developed, and afterwards cleared in a solution of hydrochloric acid, the process shown being what is called the "cold bath," development being complete in thirty seconds. It was also shown that it was impossible to overdevelop a correctly exposed print, and it was recommended that negatives giving hard contrasts should be printed under green glass, whilst for weak negatives blue glass was advisable. The lecturer also described and illustrated the means of developing with a brush, also by the aid of glycerine, and showed how to retard the action of the developer by this means on any part desired, such as in "vignetting." Prints were also shown on a specially prepared linen fabric, and which compared favourably with those on paper, both in the simplicity of working and quality and depth of tone. The sepia process by means of "hot development" was shown, the temperature of the developer required being from 150° to 170° Fahr. A new magnesium lamp for printing by was on view, and the method of printing by it illustrated with a twenty second exposure, the lamp being driven by compressed hydrogen and oxygen gas, thirty grains of magnesium being used, and it was pointed out that the lamp was twelve times more rapid than sunlight for printing by. Sixty prints could be done in an hour by its aid. A specimen of a new patent "Key" camera was shown.

Bradford Photographic Society.—February 28, the Rev. W. H. Eastlake in the chair.—A paper, prepared by Mr. P. R. Salmon, was read by Mr. P. Wilkinson, on *Printing Methods*, which was enthusiastically received by the large number of members present. Mr. Salmon exhibited some remarkable pictures of his own work, and others kindly lent by the editor of *The Practical Photographer*, which caused endless discussion and enthusiasm. Mr. Salmon was prevailed upon to explain more in detail his methods of working, which he did in a very satisfactory manner, and afterwards solved the many difficulties that were brought up. It was proposed that Mr. Salmon should take steps for the publication of his lecture in book form. A vote of thanks was accorded to Mr. Salmon for his instructive lecture, and to Mr. Wilkinson for the reading thereof, and finally to Mr. Eastlake for so ably occupying the chair, all of which were carried unanimously. The next meeting will take the form of a lime light lecture and demonstration on the "Frena" hand-camera by Mr. F. O. Bynoe, which will prove highly interesting. All interested are cordially invited.

Durham City Camera Club.—Annual Exhibition.—The Judges were Messrs. J. P. Gibbon, Hexham, and W. Parry, South Shields, and their awards were as follows:—Class A, silver medal, No. 35, W. Thomas, Herne Hill, London (*Sunset on the Pool*); bronze medal, No. 42, P. Bulmer, Chester-le-Street (*Winter on the Wear*); bronze medal, No. 57, J. E. Goold Elswick (*Autumn*); certificate, No. 22, Barras R. Reed, Hexham (*On Fenham Flats*); certificate, No. 13, W. Groom, Hereford (*By the Sad Sea Waves*). Class B, silver medal, No. 110, P. Lancaster, Tunbridge Wells (*Study of a Head*); bronze medal, No. 111, W. S. Aston, Birmingham (*A Portrait*); certificate, No. 96, Barras R. Reed, Hexham (*A Sunny Garden*); certificate, No. 132, H. W. Bennett, London (*The Choir of St. Paul's*). Class C (Lantern Slides), silver medal, No. 153, George Hankins, London; bronze medal, No. 152, Barras R. Reed, Hexham; certificate, No. 151, Hugo Meynell, Cheadle. Class D, silver medal, No. 171, E. White, Durham (Set of Landscapes); bronze medal, No. 177, R. Hauxwell, Durham (*Bridge at Ovington-on-Tyne*). Class E, silver medal, No. 186, F. W. Cluff, Durham (*Three Interiors*). Class F, medal, No. 193, J. Hunter, Durham (*Knitting; Sewing; Mother*). Class G, medal (equal), No. 199, R. Hauxwell, Durham; medal (equal), No. 198, J.

Morson, jun., Durham. Class H, medal, No. 238, Miss C. Fawcett, Durham (Temple of Thespion ; View near Corinth ; Harbour of Itea, Corinth) ; certificate, No. 206, Rev. H. E. Fox, M.A., Durham (Buncrana Sands). Class I, medal, No. 257, J. Morson, jun., Durham (Sky Effects) ; certificate, No. 251, F. W. Cluff, Durham (Winter Scenery). Class K, certificate, No. 268, Rev. H. E. Fox, M.A., Durham (Bucrana Bridge) ; certificate, No. 270, E. White, Durham (Artillery at Practice). Class L (Lantern Slides), medal, No. 283, F. W. Cluff, Durham ; certificate, No. 273, Rev. H. E. Fox, M.A., Durham. Special Prizes. Silver medal, No. 232, Miss C. Fawcett, Durham ; bronze medal, No. 202, W. Richards, Durham. The Kinetoscope, showing by electricity 2760 photographs in one minute, came in for a large share of attention from those who visited the Exhibition. In the evening there was a display of lantern slides set up for competition, being followed by a concert, the artistes being :—Mrs. R. Hauxwell, and Messrs. F. W. Cluff, R. Hauxwell, G. Leatham, D. Whitehead, and J. Nutton.

Liverpool Amateur Photographic Association.—February 28, the President (Mr. G. B. Newton) in the chair.—Three new members were elected. After the conclusion of the ordinary business, a new and ingenious dark slide, sent by the Thornton-Pickard Company to the Secretary for exhibition, was passed round, after which Mr. Joseph Earp gave his lantern lecture, entitled, *Rambles in Upper Rhineland*. The slides, abut 140 in number, which were from negatives taken by Mr. Earp and his travelling companions, Messrs. J, H. Day and J. W. Swinden, were very fine, and, together with the racy humour of the lecturer, which appeared to be inexhaustible, were much appreciated by the members.

Midland Camera Club.—February 27.—Dr. HALL-EDWARDS gave a demonstration of *Uranium Toning*, showing some bromide prints with very fine brown tones, and, as curiosities, some reddish-yellow, green, red-brown, dark yellow, and orange yellow. Few of these colours are of any practical value. In most cases the colours are muddy, and in many cases you could not obtain the colour you wished, and in others the whites were discoloured. For sepia and brown tones the prints should be perfectly washed, so as to remove every trace of hypo, A good plan was to dry them after complete washing, and then to rewash them on the following day previously to toning. The toning bath is composed of dilute nitric acid, dilute sulphuric acid, solution of potassium ferricyanide, solution of uranium nitrate, and distilled water. The prints are put into the bath whilst still wet, and the dish must be kept rocking during the whole time of toning. When the desired tone is obtained, the print should be lifted out of the bath and placed, face downwards, in a dish of water, and the tap be allowed to run upon the back. The tap must on no account be allowed to run for any length of time upon one spot, or all the uranium may be removed. If a print be left for a considerable time in water, the whole of the tone will disappear, as uranium is exceedingly soluble in water which contains even a trace of lime. For this reason the washing must be rapidly performed. Should the uranium be removed, it can be retoned, but it will be found to have lost density in the operation. Gelatino-chloride prints can be toned with uranium, but the resulting tones are anything but pleasant.

Rotherham Photographic Society.—Annual Exhibition.—On Monday and Shrove Tuesday, February 25 and 26, the Sixth Annual Exhibition in connexion with the Rotherham Photographic Society was held in the St. George's Hall, Rotherham. The venture proved very successful, there being a good attendance on both days. Some 400 prints were tastefully arranged on the walls, and also duly catalogued. The exhibitors included the Right Hon. the Earl of Scarbrough, Lord Lieutenant of the West Riding, Right Hon. A. H. Dyke Acland, M.P., Minister of Education, Messrs. F. P. Cembrano, jun., C. B. Keene (a choice collection of the work of the late Mr. Richard Keene), the Autotype Company, and Messrs. Cadett and Neal (instantaneous views by Messrs. Byrne, Richmond). Mr. W. G. Fox, an honorary member of the Society, was represented by twenty-four charming pen-and-ink sketches, full of suggestiveness for the photographer. One honorary member and twenty-two members sent examples, some of the entries attracting a good deal of attention on account of their merit. This was especially the case in regard to a number of frost-on-windowpane enlargements by Mr. J. Leadbeater, Vice-President. The members' competition work underwent careful inspection, the result of the judging by Mr. F. P. Cembrano, jun., having been kept secret until the issuing of the catalogue. The awards were as under :—Four contact prints (any process): 1, G. T. M. Rackstraw (Vice-President) ; 2, R. Chrimes, jun. Seven entries. Four contact prints (silver albumen, gelatine, or collodion printing-out paper) : 1, R. Chrimes, jun. ; 2, A. S. Lyth. Eight entries. Four contact prints (bromide, carbon, or platinum) : 1, R. Chrimes, jun. (withheld by rule) ; 2, G. J. M. Rackstraw ; 3, H. C. Hemmingway (Hon. Secretary). Four entries. For members who have not taken a Society's prize. Four prints (any process) : 1, Miss Mary A. B. Crossley (hon. member) ; 2, W. Firth. Five entries. Six lantern slides: 1, H. C. Hemmingway ; 2, R. Chrimes, jun. Seven entries. No competition in the class for instantaneous work. The prizes in the first-named class are given by Dr. Baldwin, the President. In the other classes the first award is a bronze medal, and the second a certificate. The Society also made its first display of photo-survey prints, some eighty being arranged. Mention should be made of Messrs. Taylor, Taylor, & Hobson's specimens of improved lens fittings, Messrs. Marion & Co.'s frames of "Mariona" paper prints and the "Photo-autocopyist" reproductions. On each evening there was a special lantern-slide exhibition, some prize slide being projected on the screen on the Monday, and those of members on the Tuesday. Mr. J. Leadbeater manipulated the lantern. There were also appropriate musical interludes. The Exhibition was opened on the Monday by Mr. E. Isle Hubbard, Vice-President, in the absence of Dr. Baldwin, the President. Amongst those attending was Mr. O. de Mirimonde, President of the Barnsley Photographic Society. Mr. T. Firth, President of the Sheffield Society, sent a telegram wishing the effort success.

FORTHCOMING EXHIBITIONS.

1895.		
March 18–20	..... West Surrey Photographic Society.	Public Library, Lavender Hill, S.W.
,, 25–30	..... *Brixton and Clapham Camera Club.	F. W. Lovett, 11, Corrance-road, Brixton, S.W.

* Signifies that there are Open Classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 3985.—"Improvements in Photographic Cameras." A. C. SMITH and A. A. SMITH.—*Dated March*, 1895.

No. 4277.—"Improvements in Photographic Cameras." W. R. BAKER.—*Dated March*, 1895.

No. 4431.—"Improvements in Photographic Plate-holders." G. P. SPOONER.—*Dated March*, 1895.

No. 4432.—"Improvements in Photographic Film-holders." G. P. SPOONER.—*Dated March*, 1895.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE AMMONIUM CARBONATE DEVELOPER.

To the EDITOR.

SIR,—There is not much mystery about the results recorded in your last issue by Mr. Matthew Wilson, if, as I take it, he proposes to apply ammonium carbonate as a developer for over-exposure, but the sesquicarbonate of either potassium or sodium would produce similar results with the advantage of greater uniformity, and, therefore, reliability.

The alkaline carbonates have long been recognised as combining with the developing power of the caustic alkali the restraining influence of the carbonic acid, and their relative energy, of course, depends upon the proportion of the latter present in any sample. Bicarbonate of soda has actually been proposed as a restrainer in place of bromide of potassium ; and as the sesquicarbonates are only mixtures of the so-called "neutral" or normal carbonates and the acid or bicarbonates, ammonium sesquicarbonate is equal to a normal carbonate, *plus* a restrainer.

The sesquicarbonate of ammonia was first employed in conjunction with pyro as a developer, probably because the normal carbonate of that base is not known in the separate state, just as many people travel third-class because there is no fourth ; but, on the introduction and general adoption of bromide as a restrainer some thirty years ago, it was relinquished in favour of liquor ammonia, which was found to be both more energetic and more reliable. Although it possesses certain advantages in the production of pleasing tones in transparencies, I scarcely think it will be found sufficiently powerful for our up-to-date negative developers ; while as a remedy for over-exposure its results will be obtained with greater certainty by the employment of restrainers of known strength.—I am, yours, &c.,

W. B. BOLTON.

March 5, 1895.

RE HALF-TONE NEGATIVES.

To the EDITOR.

SIR,—Discussing the theory of the spreading of the dots with my friend, C. E. Webber the other evening, it occurred to me whether the solution of the mystery lay on these lines.

We had been speaking of the action of the spider when spinning his web and plucking the fibre as he goes from stay to stay, and thus creating a concentration of glutinous matter in the centre of each division of his spiral. Now, this is caused by *vibration*.

Are the dots produced by vibration too ? Does the line of light, passing through the transparent portion of the line screen vibrate, and in proportion to its intensity, and is the film acted on by these vibrations to the extent of the large dots or squares in the high lights, and the finer dots in the shadows ?

I notice, under a high microscpic power, that the dots in the shadows on the negative are connected by a fine line of light, which fact, I think, supports this theory. I should like to know what Captain Abney thinks of this, as I fancy the solution of the matter lies in this direction.—I am, yours, &c.,

W. A. WHISTON.

Collegiate School, Llandudno.

FOCUSSING METHODS.

To the EDITOR.

SIR,—When the historical showman polished up his lenses, and told his youthful audience "not to breath upon the glasses," he forgot to say "unless you admire diffusion of focus!"

Your correspondent, Mr. Alfred Maskell, who is regretting the want of elasticity in our lenses, and other admirers of the hazy type of photograph have, perhaps, never observed the effect of breathing upon the lens. I can assure them it will give a wonderfully increased power to render the effect desired, or upon a piece of glass held before the lens, or a little vaseline applied with the finger, will enable almost any effect of softness or haze to be produced. As a draughtsman and sketcher, as well as an amateur photographer, who is shortsighted and obliged to wear spectacles, I have for many years known what diffusion of focus is, and I don't like it, or I should do away with my spectacles or vaseline them.

I hope some of your readers will try to produce a Salon picture from the above suggestions which gives such increased power to the existing photographic lens, if such is desired.—I am, yours, &c.,

Camera Club. FRANK HOWARD.

EAST WIND AND LIGHT.

To the EDITOR.

SIR,—Is there any connexion between the supposed extra exposures of plate in an east wind and the following observation by Mr. Fleeming Jenkin in his book of *Electricity and Magnetism* (page 368)? "He has observed a difference of potential between the earth and the air, nine feet above it, equal to 430 volts in ordinary fair weather and in breezes from *east and north-east* as great a difference as this *per foot* of air."—I am, yours, &c., NATHANIEL MERRIMAN.

Chepstow, February, 26, 1895.

THE SPEED OF PLATES.

To the EDITOR.

SIR,—The little duel between Messrs. Marion & Co. and Mr. Cadett in your columns seems to an "old hand," like myself, much more amusing than profitable. I am one of those who welcomed the thoroughly practical papers of Mr. Williams a year or two ago, in which he proved conclusively that the Hurter & Driffield scale of rapidities had in actual practice nothing reliable in it—that it was, at the best, but approximately accurate when the factors of a given make of plate, a given developer, and certain artificial light were used together. Further experience has confirmed this view, which finds a welcome expression in Mr. B. J. Edwards's paper on p. 590 of the current BRITISH JOURNAL PHOTOGRAPHIC ALMANAC—a paper that well condenses the opinions of careful observers of wide experience everywhere and merits reperusal by any of your readers likely to be led to place reliance on speed numbers past or present. —I am, yours, &c., SENEX.

To the EDITOR.

SIR,—I note Messrs. Hurter & Driffield's letter in your issue of March 1. Permit me to say that I fully endorse all that Messrs. Hurter & Driffield say. I should be very unwilling to cause any misunderstanding whatever as regards different kinds of developers giving different results. I was well aware that Messrs. Hurter & Driffield knew this, indeed, they published their experiences with rodinal in 1890, which interested me very much, wherein they found that rodinal gave far more speed than ferrous oxalate with the particular plate that they were using; therefore, knowing this, my intention was not to convey for one moment that we had shown Messrs. Hurter & Driffield anything that they did not know in this regard.

As regards the alteration of density ratios by ringing the changes on the proportions of the constituents of any given developer, this is a matter that has been known to me for some years, and one which I have always endeavoured to point out; at the same time I can quite believe, and indeed confirm by late experiments, that some emulsions show very much less difference with various alterations in the constituents of the developer than others, and therefore it is not to be wondered at that Messrs. Hurter & Driffield, in experimenting on very slow plates made expressly for them, should have come to the conclusion that the density ratios were unalterable by the alteration of the constituents of the developer; indeed, only a few weeks ago, I had results which confirmed this idea with a very slow make of plate. With the modern rapid plate, however, the matter is quite different. The variations which can be obtained in actual speed by the alteration in the constituent quantities of the developer are simply enormous, so great indeed that no explanation such as Mr. Watkins gives of a fog theory will suffice to put this matter right. I so thoroughly agree with all that has been said by Messrs. Hurter & Driffield in their letter that I have really nothing to add, excepting that we ourselves intend both markings to be under the complete control of Messrs. Hurter & Driffield, and no effort shall be spared on my part to make speed testing for the future reliable and useful. Now that we have a standard ferrous oxalate developer formulated, and that Messrs. Hurter & Driffield are prepared to recognise that plate-makers are entitled to quote the speeds obtainable by the formula most suited to their plates, all difficulty vanishes, and there is no reason why speed testing should not become a most useful adjunct to the photographer, provided always that all speed numbers are under the control of a recognised authority. Whilst the matter remains in the chaotic condition that it was before the points I have mentioned were recognised, it was quite impossible for comparative speed testing to be of any value as regarded universal testing, though such readings have been of value for individual comparison of any particular make of plate.

Now, with regard to Mr. Watkins' letter. I little thought that I should have drawn a red herring across the trail of our friend Watkins. I am sorry to say anything contrary to his opinions, inasmuch as I have the greatest admiration for all his work, and particularly for his useful little exposure meter; but I think I am entitled to make a complaint against him. To begin with, he makes some most extraordinary statements which I cannot understand. He says: "I sincerely trust that Messrs. Hurter & Driffield will not permit their hand to be forced by Mr. Cadett in this matter, and that they will continue to refuse to allow their name to be attached to speed numbers which are not obtained with their standard ferrous oxalate developer. Users of plates regard Hurter & Driffield numbers as referring to one definite standard." Now, it is a poor compliment to the ability of Messrs. Hurter & Driffield to suppose that they would allow any one to force their hand, and a still poorer compliment to me to imply that I wish to force any one's hand. I want *truth, and nothing but the truth.* Next I would ask Mr. Watkins what standard ferrous-oxalate developer he refers to? My letters have been written to inform him and others that at last a standard ferrous oxalate developer had been formulated at *my* urgent request, for, until lately, such a developer did not exist; and also, until quite lately, I was not aware that any maker using the Hurter & Driffield system used ferrous oxalate at all. Mr. Watkins could scarcely have read my letters. What does he mean by "users of plates regarding Hurter & Driffield numbers as referring to one definite standard?" I ask, What *definite* standard? Does he limit the value of the Hurter & Driffield system to ferrous-oxalate development only—a developer that practically no one uses? If Mr. Watkins likes to come down to Ashtead at any time, I can conclusively prove to him the enormous alteration in speed to be obtained by altering the constituents of any given developer he may like to name. Possessing, as I do, instruments of the most delicate character, and thoroughly up to date, I feel in a position to make him this offer, and I will prove to him what I say. I do not care to discuss matters of mere opinion; I only wish to discuss those based on facts, shown by many hundreds of trials. In my factory we constantly use no less than *five* different developers.

Now, I would point out to Mr. Watkins that his explanation of variations in speed due to fog does not hold at all; we deduct the fog, and in spite of this fog deduction, the plate still reads far higher in speed with the strong developer than with the weak one.

Now I come to another very important point; if one developer be more powerful in giving speed than another, it is clear that any fog on the plate of the nature of light fog, or any fog which would cause a similar reduction of silver, would still more be acted upon by the strong developer than the weak one, and so we find it. In testing plates for commercial purposes, we test with a particular developer, and note the fog-reading with this developer at a certain temperature. But, now suppose we take a more powerful developer, this fog is read much higher, owing to a more powerful reducer. Let us now take a rapid plate which is *practically free* from fog. We find that our powerful developer produces scarcely any more fog than the weak one, while the speeds are enormously different. Lately we have been making plates in which the fog-readings between restrained developers and powerful ones show scarcely any difference at all; indeed, the fog is so slight that it may be neglected, and still, in spite of this, speeds will differ to the extent of several hundreds per cent. I think, if Mr. Watkins will reflect, he will find that his explanation of speed relation to fog is entirely untenable, and speed remains a matter of development as well as of exposure. By placing all speed reading under the control of a recognised authority like Messrs. Hurter & Driffield, there need be no fear that any maker would be tempted to outstrip his competitors by false marking. Besides, no firm of good reputation would willingly falsely mark; such a suggestion is out of the question for any respectable firm. I am very glad indeed to see that Mr. Watkins says his fog theory has not yet been absolutely proved; this is the one saving clause in his letter, for it shows that his explanation is mere theory, and not based upon any proved fact. I note that Mr. Watkins appeals to such investigators as Mr. John Sterry. I am delighted with this appeal, for Mr. John Sterry was present at the experiments made with Mr. Driffield when he honoured me with a visit, and the suggestion for double marking of plates was laid before him as well as Mr. Driffield, and, as far as I know, it met with the approval of both.

Those who are testing plates every day by the beautiful system of Messrs. Hurter & Driffield cannot fail, if they use instruments up to date, to observe the enormous influence of development upon speed; indeed,

so many hundreds of times have I observed this, that I feel I am fighting a safe battle. As a word of advice to those who may be sufficiently interested to make a Hurter & Driffield photometer, I would say, by all means attach to this instrument the beautiful prism photometer of Messrs. Schmidt & Haensch, of Berlin. The delicacy of this instrument is such that speed-reading is quite an easy matter, and so accurate that there is no difficulty in running a straight line almost exactly through every point in the period of correct exposure. This instrument, coupled with Mr. Dibdin's Pentane Argand, places one on the exact and scientific basis for work. Mr. Watkins says, "Work rather than controversy is wanted just now." I beg to inform friend Watkins that I have worked hard over a long period, with hundreds of trials and experiments, and consider it now time to say something definite from those experiments. He cannot surely expect those who have worked to wait until he in particular is convinced. By all means, let him work until his doubts are cleared, and no one more than myself could wish to have the benefit of his experience and labour; but on the subjects of my letters I have no doubts, and, after the enormous amount of work I have gone through, I feel entitled to be heard.

To make myself perfectly clear, I would say that I by no means contend that fog may not be unevenly distributed through a range of densities. But, if so, such fog, if greater in weak densities than in strong ones, becomes, as Mr. B. J. Edwards pointed out, actual speed; but, as I said before, the amount of fog is insufficient to account for the extra speed, no matter how we place fog in speed estimation.—I am, yours, &c.

Ashtead, Surrey, March 2, 1895. JAMES CADETT.

GELATINO-CHLORIDE PAPER IN INDIA.

To the EDITOR.

SIR,—On page 687 of the 1895 ALMANAC, a contributor gives his experience with gelatino chloride paper, and his opinion is decidedly against its keeping qualities. I have worked this paper for the last two years, having given up albumenized paper. I have had, hitherto, no cause to regret the change; on the contrary, I have benefited, for it is difficult to find native printers who are up to sensitising paper as it should be done, and one cannot at all times find time to do it oneself. Prints in my possession, done two years ago, are quite free from any appearance of fading up to time of writing. I may say I have never used any brand other than the Ilford.—I am, yours, &c.,

Clyde House, Jubbulpore, February 14, 1895. H. HAND.

HEATING STUDIOS.

To the EDITOR.

SIR,—In your article on *Heating Studios*, in THE BRITISH JOURNAL OF PHOTOGRAPHY of the 22nd ult., you ask for experiences. With your permission, the following are mine of the low-pressure system of heating by hot water. In your article you put the minimum of the size of the pipes at four inches; this is not necessarily the case, as mine are only two-inch pipes, and yet are a perfect success. After all sorts of experiences, lasting over many years, of open fire-grates, stoves (slow combustion and otherwise), hot air, as in the Calorigen, &c., I know of no other method by which so even a temperature can be maintained at such low cost, and with so little trouble, and also with an entire absence of dust. Again, it would be quite possible in building new establishments, to so contrive it that the pipes might be inside an ornamental and perforated skirting board, so that their unsightliness could be hidden, yet easily getatable in case of need. When I first thought of adopting hot-water heating I had several conversations with a horticultural friend on the size of the pipes, and he, with the experience of years, recommended nothing less than the orthodox four-inch pipes. But I reasoned with him thus: "You are obliged to use such an area of heating surface because your roofs are *all* glass, and your side walls low and not very thick. In my case I have, comparatively, but little glass surface, and substantial high walls." Well, the result was I had fixed the two-inch size, and the apparatus has been in constant winter use since 1887, and up to the present has never cost anything for repairs, and has done its work efficiently and, I think, with extreme economy, when it is considered that the average consumption of coal is but two tons annually.

During the late frost the fire was never out but once, and that through carelessness; even then the pipes did not cool. Now a word as to the stoking. The boiler is of the ordinary saddle pattern, and works nearly 190 feet run of piping perfectly. I use anthracite coal exclusively, excep when relighting, when for ease and speed the ordinary bituminous coal, or a couple of bricquettes (locally called patent fuel) are used. In this neighbourhood anthracite coal is largely produced, and is therefore easily obtainable, and costs 15*s.* per ton; but, doubtless, in all the large towns coal merchants supply it for greenhouse fires. To the uninitiated this coal might be easily recognised by its extreme hardness and stone-like character, its slow burning qualities, extreme heating power, and absence of gassy flames during combustiion—in fact, burning a dull, cherry red. After the fire is once lit, the *modus operandi* is as follows: Pull out the damper the first thing in the morning (about 9.30), then thoroughly rake out the ashes and any clinkers there may be on the fire bars; add fresh coal to fill up in about an hour or less. The damper may be closed more or less according to the requirement. In the evening (5.30) refill with coal and throw on a shovel of ashes over the lot, so as to lessen the draught. With a week's practice one will be able to gauge to a nicety the adjustment of the damper. Of the comfort of finding the whole of one's workrooms and studio at a nice temperature the first thing of a winter's morning, I need not enlarge upon. Nor have I mentioned the use of coke as a fuel, though I have tried it, for, besides being a constant source of danger in a photographic establishment, it has not the advantages of anthracite coal from an economical or heating point of view.—I am, yours, &c., CHARLES H. EVANS.

Swansea, March 4, 1895.

THE PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—I have received several circulars from the officials of the Photographers' Copyright Union, and have now a letter from the Vice-President, asking me to fill in the pamphlet and to forward 10*s.* 6*d.*, the amount of the member's annual subscription. As I think it very probable that my views in the matter are shared by a good many photographers throughout the country, I should like to reply through your columns since it may lead to some discussion.

It is not my practice to ask people to sit to me, and as a consequence, it is a most unusual thing for me to possess the copyright in a portrait. I do not trot about either asking permission to photograph every conceivable object and "function" that arises, so that even here it is but very infrequently that I do a photograph I am wishful to make copyright. Under these circumstances, I fail to see the equity of putting men like myself upon an equal footing with the big publishing photographers who adopt solicitation as part and parcel of their business life. To me half a guinea a year would be a considerable sum to pay for assistance in any dispute as to a copyright photograph—a remote contingency—while to many of these photographers of celebrities, it would be a totally inadequate amount. Possibly the Committee may see some means of meeting such cases as mine, so that every photographer may have a reasonable opportunity of allying himself with a good cause.—I am, yours, &c., "PROVINCIAL."

THE LINKED RING.

To the EDITOR.

SIR,—Mr. H. W. Bennett, referring to the *Linked Ring*, asks me to reconcile the fact—or what he states as a fact—that "acceptance or rejection of photographs submitted for their Exhibition is decided by a committee of Judges who are themselves competitors," with a statement in my letter to the effect that the *Linked Ring* is a successful and generous institution. He also complains that the majority of the pictures are the work of the *Ring*, and that a competition in which the Judges compete cannot possibly be fairly conducted.

My letter referred to the misinformed and very anonymous Greek who had soiled the pages of your previous number, and not to Mr. Bennett, but I do not object to reply to him.

The Salon is not a competition; therefore there can be no competitors. This disposes of a good deal of Mr. Bennett's complaint. To carry out the implication of Mr. Bennett's letter, very little of the work of a society should be performed by the members, certainly not the selecting, judging, or hanging of pictures; but I would ask him if he can refer to any exhibition of pictures in which the members send out for outsiders to do their work? The Salon is worked on the lines of the Royal Academy, but with more generosity to outsiders. The R.A.'s claim their space as a right; the *Links* submit their works to judgment, and if any contributors are treated unmercifully, it is the Links. I have myself been among the rejected at both exhibitions. At the R.A. the outsiders are judged by a Council of twelve Academicians; at the Salon this duty is not delegated to a small committee. Links and outsiders are judged together by as many of the forty members as can attend to do the onerous and not particularly agreeable work. No member is allowed to be present when his own pictures are under notice. No favouritism or considerations of policy are permitted, or are, indeed, possible. Only those pictures which are, in the opinion of a majority of the committee, pictorial are selected. If only a dozen pictures were found good enough, a dozen only would be selected. Nothing is kept for the sake of padding, but we admit that none of us are infallible (except one or two of the younger members), and a few indifferent works may pass the censorship, and a few good ones be rejected. The *Linked Ring* cordially welcomes good work by outsiders, and eagerly looks after promising young photographers.

That there is a preponderance of the works of the members of the *Linked Ring* in the Salon is easily explained.

I don't want to appear boastful, but it is a fact that the *Ring* has admitted nearly all the best pictorial photographers at home and abroad into its ranks. They are all enthusiastic in the cause; they have only one

united aim, but many methods, and nearly all produce work specially for the Exhibition; it naturally follows that the largest number of important pictures come from the members. The object is to get the best pictures, not to please the largest number of contributors.

The success which Mr. Bennett seems to think we have not achieved consists in getting together the finest collections of pictorial photographs that have ever been seen, and attracting the public to look at them. By doing this, we claim to have advanced the cause of artistic photography, which was our object and is our success. We also claim to have awakened a much greater regard for art in photographers themselves, to the improvement of their work; also to have enlivened the pages of the photographic press. We have been the cause of wit in others, and, if in being so we have occasionally "put an antic disposition on," we may be easily forgiven. H. P. Robinson.

P.S.—After all Mr. Bennett has little to complain of. I find four of his pictures in the 1893 catalogue. This is over the average for each exhibitor. I hope he will have as large a proportion another year.

RE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the Editor.

Sir,—We regret to have to inform you that at our Committee meeting on Thursday last, we granted the last penny of our available funds. There are other applications before us which we should like to answer favourably by a grant or loan, but we have carefully considered the position and decided that we cannot overdraw our bank account, and ought not to distribute any money that is not properly available for the purpose. It seems strange to us that with a profession including many thousands of men well able to subscribe the small sum of 2*s.* 6*d.*, which is our minimum subscription, we should be now reduced, in spite of our frequent appeals, to the position of having to refuse the applications of those helpless and destitute members of the craft who are suffering from no fault of their own, but simply from old age, illness, or lack of work. Last year we received 51*l.* 5*s.* 10*d.*, and distributed 141*l.* 19*s.* This year we started with a balance of 58*l.* 10*s.* 6*d.* in hand, and have distributed the whole of it to cases which have stood the strictest investigation, and in which the money has been granted with an almost niggardly hand. We cannot do more than lay the case before your readers.—We are, yours, &c., (*For the Committee*), H. Snowden Ward, *Hon. Secretary.*

6, *Farringdon-avenue, London, E.C., March 4th,* 1895.

P.S.—Since writing the above we have received from Mr. Charles Sweet, of Rothesay, a contribution of 1*l.* to the funds. He says: "I wish the Benevolent God Speed; 14*s.* 6*d.* was received for the use of my dark room, the balance is made up by me to make the money even." Mr. Sweet suggested in the papers a long time ago that professional photographers should make a charge of 6*d.* per head to amateurs using their dark room, and should send the money to the Benevolent. He has evidently carried out this suggestion, and we think it might well be adopted by many others.

To the Editor.

Sir,—Give me a short space to ventilate a well-known grievance in reference to the short-sightedness of photographers' assistants, viz., their neglect in not availing themselves of the excellent provision the P. B. A. offers them for a nominal sum. I believe that a many who have had assistance from the "Benevolent" have never subscribed a penny to its funds. In future I suggest to employers declining engaging or in any way addressing assistants, who are not either members of the "Benevolent" or some other benefit society

If all assistants who are in good work would join the "Benevolent," it would have ample funds to meet the increasing number of deserving cases wanting temporary assistance.—I am, yours, &c.,

Baker-street, London, W. Thomas Fall.

MONKLANDS PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the Editor.

Sir,—Your report in a recent Journal—a good one in many respects—unaccountably omits any mention of what, in my opinion (and, I have no doubt, that of most people who have visited the Exhibition), is the most interesting contribution of all—viz., the frames sent in by Mr. Dunlop, the hard-working and enthusiastic President of the Society. In addition to several well-executed enlargements of figure subjects, he contributes at least two frames, which merit more than passing notice, the first an exceedingly instructive series of birds' nests with eggs, and the other an enlargement of the interior of a house nearly 350 years old, showing portion of an oak beam which is estimated to have been part of a growing tree 1000 years ago.

Mr. Dunlop s exhibits are all of a high-class order and creditable to his long and careful study of all pertaining to photography since the earliest days of wet plates. I am sure your reporter must have taken special notes of Mr. Dunlop's work, and overlooked them in extending them, otherwise the oversight is quite unaccountable.

Having the utmost confidence in your desire to correct any such oversight. I am sure you will spare me so much space to do justice to one who has been a devotee of the camera for nearly thirty years, and who still loves photography so well that you may meet him almost anywhere in Scotland, but seldom without his camera. Thanking you in anticipation,—I am, yours, &c., R. C. Platt.

Airdrie, February 25, 1895.

THE PROGRESS MEDAL.

To the Editor.

Sir,—Your shrewd correspondent, "H. J. M.," seems to have discovered the reason why the progress medal was awarded; but, when he gives "exhibiting at the Salon" as the chief evidence of progress in the lucky gentleman to whom it was awarded, he seems to have forgotten the best part of the fun. Rumour says that the new medalist favoured the Salon with his one exhibited picture during the three-years' limit at the instigation of his friend, Mr. H. P. Robinson, which, considering one thing with another, seems to add to the comicality of the situation.

Another thought strikes one. If the progress medal was given for exhibiting at the Salon, does it not follow that that progressive Exhibition itself should have a medal, but not in so depreciated a metal as silver? Could there be a more graceful gift from the Royal Photographic Society to a friendly rival that has done so much to keep that venerable institution itself up to the mark? Astonished!

THE PHOTOGRAPHIC SALON.

To the Editor.

Sir,—May I ask the favour of the announcement in your Journal that the Photographic Salon 1895 will open at the Dudley Gallery on Monday, September 30, and will remain open until the evening of Saturday, November 2.

The condition of entry will be the same as in previous years, that is to say, that it is open to all to send in work for selection by the Committee. Entry forms with full particulars will be sent out early in July, and may also be obtained by application to me at the gallery after that date.—I am, yours, &c., Alfred Maskell, *Hon. Secretary.*

Photographic Salon, Dudley Gallery, Piccadilly, W., March 1, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange outdoor background of excellent quality, 8×8, for interior ditto. Must be flatted oil and not elaborate.—Address, G. N. Futcher, Chichester.

Will exchange large fox-skin rug (4 feet by 4 feet 4 inches) for folding stereo camera or half-plate rectigraph lens.—Address, C. Murray, Nightingate-terrace, Sutton, Surrey.

Two backgrounds in flatted oil, one interior 8×7, one exterior 7×5, wanted in exchange for hand camera or good stereoscope.—Address, W. H. Heming, East Cliff, Whitby.

Will exchange three-and-a-half-inch compound condenser in gun-metal cell for Watkins or similar exposure meter.—Address, H. A. Morison, 304, Hoe-street, Walthamstow, Essex.

Exchange a Ross whole-plate rapid symmetrical lens, new condition, for a wide-angle symmetrical by Ross or Dallmeyer, seven inches focus.—Address, T. H. Smelt, Photographer, Fleet, Hants.

Wanted, exterior background, 8×7 ft.; in exchange six and a half-inch cabinet burnisher, nearly new, cost 21s.; photograph sent.—Address, J. E. Palmer, Photographer, 54, Furlong-lane, Burslem.

Capital half-plate burnisher, oscillating roller, mahogany base; exchange for good glazier's diamond or half-plate camera.—Address, J. Horton, Central Photographic Studio, Caroline-street, Cardiff.

Wanted, in exchange for stereoscopic camera, complete, with lens and four double dark slides, in good order, for interior background or headrest.—Address, Mrs. Wynne, Photo Studio, Castlebar, co. Mayo, Ireland.

I will exchange magic lantern, 3-wick burner, by Watson & Sons, cost 2*l.* 2*s.*, condition as new, for hot rolling press, or good time-shutter to fit whole-plate lens.—Address, J. J. Wyeth, 7, Vivian-road, Peckham Rye, London, S.E.

Will exchange Ross's 10×8 concentric, iris stops, new; Ross's No. 4 portable symmetric; and Ross's No. 2 *carte-de-visite*, for Ross & Zeiss anastigmatic, Series II., No. 8, preferred.—Address, Richard S. Burgess, Port-hill, Longport, Stoke-on-Trent.

Will exchange a dark tent to develop up to 12×10 (folding), enlarging easel, and interior background (oil), 8×8 feet, for roller or burnisher not less than eight inches, or wide-angle lens, 10×8 or 12×10.—Address, J. K. Townsend, top of Mansfield-road, Nottingham.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

JOSEPH LEWIS.—Forwarded.

MANCUNIUN.—The 1873 and 1878 patents are void, but there are some subsequent patents which are still in force.

X. Y. Z.—You would be liable; hence, in such cases, it will be well to secure an indemnity from the person who commissions you to make the slides.

H. C.—We know of no good illustrated book on posing that we can recommend to you. *Bigelow's Album*, an American work, might be obtained by advertising for a second-hand copy.

S.—After coating the whole surface with the bichromate solution it is exposed to light under the *cliché*, but the development by the brush is not carried beyond that portion of the photograph requiring the background.

T. BOWER.—The negative is very much over-exposed, otherwise there would be no fault with it. Probably you have not realised that there has been a great improvement in the actinic quality of the light during the past few weeks.

SPOTTUM asks how to spot collodio-chloride prints, so as to match the gloss of the prints, in such a way that the spotting does not come off when the pictures are burnished. He says in his hands gum or albumen is not sufficient.

AMATEUR (Glasgow).—The paper should not have deteriorated in so short a time if the formula given were adhered to. Probably something in the composition of the paper itself or its sizing may be the cause. Try another kind of paper, such as that made specially for photographic purposes.

BERT says: "Can you give me an idea of the length of bellows required for an enlarging camera 20 × 16 to enlarge from, say, half-plate, used with a lens of most suitable focus for enlarging from half, whole, or 12 × 10 negatives?"—Refer to the table of enlargements on p. 944 of the ALMANAC for 1895.

C. W. R.—As an amateur, working on a limited scale, and considering the present and probable future low price of silver, we should say it will be scarcely worth the trouble to save the residues from the fixing solutions from negatives and prints. And, if the ready-sensitised papers are used, the ashes from them will hardly be worth the trouble of saving.

EXPERT says: "I intend to photograph a painting with isochromatic plates, but do not wish to go to the expense of a yellow screen. Would varnishing the lens do it? If so, how is it to be done? Is there any other way? Kindly answer in Correspondence column."—In reply: Refer to the JOURNAL for June 10, 1892, where several formulæ for preparing pellicular screens are given.

R. S. O.—If the platinotype paper was exposed to the atmosphere and became damp, the best thing to do with it is to throw it away, as it is worthless for producing good prints upon. You are not the only one who is troubled with a careless apprentice. We expect it is part of your duty in teaching him his trade to instruct him to be careful. You certainly must not stop his wages to recoup yourself.

WHITBY asks: "Could you let me know what developer to use for platinotype cold process. I should like the proper formula. I cannot find it in the BRITISH JOURNAL PHOTOGRAPHIC ALMANAC."—We presume you mean the new cold-bath process. If so, take developing salts (sold by the Company), two ounces; water, twenty-five ounces; using *quant. suff.* for development. Clear print with HCl. as usual.

J. LOVELAND.—A lens with an aperture of *f*-5.6 will require but half the exposure of one of *f*-8, therefore it is better adapted for rapid exposures. But it must also be borne in mind that a lens with that aperture will not give the same definition over the size plate as will the one with the smaller aperture. With a lens, aperture *f*-5.6, of five inches focus, perfect definition all over a quarter-size plate must not be expected.

C. FLETCHER.—The "acetate toning bath" is usually compounded in the following proportions by those professionals who use it:—Acetate of soda, thirty grains; water, eight ounces; chloride of gold, one grain. The bath should be made up fully twenty-four hours before it is required for use. If the solution is used over again, more gold must be added the day before use. The ordinary strength of fixiug solution is employed for prints toned in the acetate bath.

G. E. asks: "Will you kindly inform me, through the medium of your columns, what method is adopted in the valuation of negatives in the case of transfer of a business?"—There is no fixed method or rule in the valuation of negatives, nor can there be, as all must depend upon circumstances. The negatives in some businesses are often of great value, while in others they may not be worth the glass they are upon. Their value is generally left to the judgment of the one to whom the valuation is entrusted.

E. PATTISON.—The coalescence of the two large picture, which by the design shown are, in effect, brought opposite to each eye, is effected in the usual way by the eyepieces of the ordinary prismatic or lenticular stereoscope. If you use silvered glass instead of prisms as reflectors, see that the silvered sides are made use of.

W. A. T.—Cover up the window with a shutter in which is an aperture, before which the camera is placed reversed, with the negative in the slide with its shutter and lid open. The camera may be supported on its stand or a table. An easel to support the paper completes the arrangement, after a sheet of cardboard has been placed outside the window at an angle of 45° to act as a reflector. If you refer to the ALMANAC for 1888, you will find fuller description, with diagram, than space will permit of being given in this column. Wooden dishes will do very well for the development, if kept clean. If they have glass bottoms, so much the better. *Papier-mâché* trays are frequently employed.

DEALER puts the following queries: "Can I as a photographic dealer lawfully, *i.e.*, without bringing myself within the reach of the law, not being a qualified chemist: 1. Sell chemicals for photographic purposes? 2. Mix formulæ brought to me and change for same? 3. Mix formulæ of my own and sell them, such as developers, &c.?"—In reply: 1. Yes, provided they are not such as come within the Pharmacy Act—cyanide of potassium, bichloride of mercury, &c. 2. Yes, if they do not contain any of the prohibited substances. 3. Yes, subject to 1 and 2. You cannot do better than advertise your requirements. Sorry we cannot tell you where there is a good opening for a photographic dealer.

RESIDUE.—1. The residues should be perfectly dry when put into the crucible. 2. A clay "skittle pot." 3. By the appearance of the contents of the pot when in the furnace. 4. Certainly, the flux—a mixture of carbonate of soda and carbonate of potash in equal parts. 5. Yes; there is danger of the crucible breaking if the heat is applied too suddenly. 6. Yes; but "furnace coke" should be used. 7. If the metal is wanted as an ingot, it must be poured into an ingot mould. That may be purchased at any of the jewellers' material dealers in Clerkenwell. 8. No. 9. It is not well to keep on adding to the contents of the pot while it is in the furnace. If this correspondent has no greater knowledge of reducing wastes than we gather from his letter, we think he will do better if he sends them to a refiner.

SCUM says: "Will you kindly give me your opinion on the following: A scum settles on the silver prints during toning, and I think interferes with the brilliancy of the finished print. The water is hard. We have tried salt in the water previous to toning, acetic acid, rain water, distilled water, but still get it. The bath we use is an acetate. Please say how we can get rid of it in the best way so as to get clear shadows during toning."—The deposit is probably due to chlorides in the water, and the only way to avoid it is to wash the prints prior to toning them in distilled or rain water. The following plan is, however, often adopted: After the silver is washed out, the surface of the prints is rubbed over with a pledget of cotton-wool. That removes the deposit before they are put into the toning bath. The address is, Science and Art Department, South Kensington.

A. E. HARRIS.—1. To prepare ferric oxalate, proceed as follows:—Dissolve 200 grains of perchloride of iron in four ounces of water, heat to boiling point, and add caustic soda (about 100 grains will be required) until an alkaline reaction is indicated. Wash the precipitate with warm water, and, when it is neutral to test paper, free it from nearly all the water by squeezing it in a clean piece of linen. The reddish brown mass of ferric hydrate should now be placed in a flask, about 100 grains of oxalic acid added to it, and the vessel set aside in the dark for two or three days. The greenish-brown solution of ferric oxalate obtained should be filtered, and the amount of acid and iron determined by analysis. The solution should exhibit a decided acid reaction; if such is not the case, a few crystals of oxalic acid are to be added. The solution does not keep. The process is somewhat troublesome, as you will observe. 2. In the Kallitype process, as we practised it, the silver salt was the "developer." For further information, see page 170 of the JOURNAL for 1890.

A CORRESPONDENT (Sugden-road, S.W.) writes: "Some time ago, when you were publishing the wet-collodion process, I tried it the whole day long (last Easter Monday), but it was entirely a failure in my hands. I could not get any picture on the plate, though I exposed for three minutes in bright sunshine. I have now been trying the collodio-emulsion process of Mr. Banks, but I find it equally insensitive to light. I have just exposed three beautifully white plates (washed in changes of water for an hour) for one, two, and three minutes, then flooded with a solution of ferrous oxalate; but no change takes place for ten minutes at least; then I throw it up. 1. Does the collodion plate require longer to develop than gelatine? 2. Is the picture equally visible as on gelatine? 3. What ought to be the exposure out of doors with open lens for collodio-emulsion?"—1. No; it develops in much less time, 2. Yes, more so. 3. Depends upon the light and the aperture of the lens. About, say, twenty times that of an ordinary dry plate. We should advise our correspondent to get a lesson or two from a practical photographer.

CONTENTS.

	PAGE
ARTIFICIAL ATMOSPHERE	145
OWNERSHIP OF NEGATIVES: A TRADE QUESTION	146
PHOTOGRAPHING ABNORMALLY LIGHTED SUBJECTS	146
PRINT-WASHING	148
JOTTINGS. By COSMOS	149
THE SCREEN AND ITS EFFECT. By W. B. BOLTON	151
OUR EDITORIAL TABLE	152
NEWS AND NOTES	152
MEETINGS OF SOCIETIES	154
FORTHCOMING EXHIBITIONS	156
RECENT PATENTS	156
CORRESPONDENCE	156
EXCHANGE COLUMN	159
ANSWERS TO CORRESPONDENTS	160

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1819. Vol. XLII.—MARCH 15, 1895.

A USEFUL APPLICATION OF SINGLE LENSES.

When giving some account of a recently introduced, and still more recently improved, hand and stand camera, the Frena, to be found on another page, it occurred to us that there was one special feature about it deserving to be isolated from that description, and treated specially. This is in the use Messrs. Beck have made of supplementary single lenses for adapting the instrument without any other focussing, to the obtaining of sharp pictures with full aperture at any distance ranging from three and a half feet to infinity.

The principle of altering the focus of a lens by the insertion in the mount of a simple single lens, either convex or concave, has long been known and acted upon, and we have frequently commented on it; but in this case a new application of the principle has been made by Mr. Conrad Beck, and it is to this that we now invite the reader's attention, because, although it is specially made for use with his firm's most recent Frenas, it is also applicable to every hand camera of the class known as having a fixed "focus," that is, those in which there is no provision made for racking the lens in or out to ensure any definite object, either near at hand or at a distance, being sharp, for, in a good hand camera, no such nonsense as fuzziness ought to be tolerated.

It is well known to all who have made a study of the subject that the addition of a simple lens of the spectacle glass genus to an achromatic photographic objective, while altering its focus, does not, in any sensible degree, impair its power of giving sharp images at its visual focus. It is, of course, possible to overdo it by selecting an inordinately strong lens as the supplemental one, by which the achromatism of the principal objective would be quite upset; but we are alluding to a simple lens selected within the limits of moderation, and the nature of which will be seen as we proceed. For a telescopic object-glass no such addition could for an instant be permissible, the nimbus around and fringes of colour imparted to a star would soon give the reason why; but the corrections of a photographic lens are not of the same order as those of the telescopic objective, and, when not overdone, permit of a slight departure from the ordinary actinic correction without affecting the photographic result.

Let us now see in what manner these principles are applied in practice to the universalisation of the focussing of a lens. The Frena, as we have said, is a fixed-focus camera, and is so adjusted that with a five-and-a-half-inch lens of the rapid rectilinear class, working at its full aperture of *f*-8, everything beyond twenty-five feet is photographically sharp. We all know that the nearer point of sharpness could be brought very much nearer by diaphragming the lens, but the reducing of the working aperture is not now being taken into consideration, for in a hand camera rapidity must be aimed at and attained, else does a camera of this class lose much of its charm.

But we want to obtain a sharp image of something a little nearer than the twenty-five feet above mentioned. The Frena system provides two means by which this can be effected. Premising that Messrs. Beck do not recommend that the lens be used at its largest possible aperture unless under very exceptional circumstances, but that a normal aperture of *f*-11 (U.S., 8)—the largest in the diaphragm plate—be employed, then, by the employment of this normal opening, the point of foreground sharpness is brought to about fifteen feet.

Still something more is supposed to be required, viz., the sharpness brought to a much nearer point without entailing further stopping down of the lens. Could the front lens of the combination be removed, and another, if only a hundredth of an inch shorter in focus, substituted for it, all would be well and the desired end obtained. But this would entail both trouble and expense. It then occurred to Mr. Beck to devise a small series of supplementary single lenses, of such predetermined foci that, by selecting any one of them and placing it in a recess in front of the camera, the focus of the whole system could be varied at will to suit the distance of the object to be photographed, and this without disturbing the primary objective.

The result of the realisation of this happy thought is a series of four thin simple lenses, each set into its cell on which are engraved its powers as regards the modification of focal range produced by its employment. Thus, No. 1 gives, with the lens at full aperture, a sharp image of all objects lying between thirty-two feet and nine feet from the front of the camera; similarly, No. 2 reduces these figures to ten and a half feet and six feet; No. 3 effects a still further reduction, the figures now representing a range from six feet to four and a half feet; while No. 4 brings the point of sharpness one foot nearer still.

Although Messrs. Beck designate these focal adapters or modifiers as Frena "Magnifiers," they are, we think, scarcely entitled to such designation. Taking Nos. 1 and 2 for example, an average healthy eye, on looking through them, will scarcely perceive that they have any magnifying power at all. This is particularly the case with the former of these, the radius of curvature being, Mr. Conrad Beck informs us, 180 inches, which, as these focal adapters are all plano-convex, represents

a solar focus of 360 inches—practically indistinguishable from plain glass, notwithstanding which it certainly shortens the focus of the objective in the ratio we have indicated. The focus of the most powerful of the series is, very roughly measured, about forty inches. The set of four lenses are fitted into a flat, neat, morocco case, which goes easily into the waistcoat pocket, and, while we may incidentally remark that they sell at a singularly low price, yet have we given this detailed description, not as in the interests of one camera in particular, but because there is an *idea* in this application of uncorrected lenses capable of being expanded if desired. Meantime to Mr. Conrad Beck be given the credit for this use of single lenses.

TIME DEVELOPMENT.

In the remarks we are about to make we have no intention of referring in any sense whatever to the system recently advocated by Mr. Alfred Watkins, in which the total period occupied in development is made to bear a definite proportion to that which elapses before the image makes its appearance. Our object in advocating the timing of the operation is less the attainment of absolute accuracy and uniformity in density and gradation than the saving of a negative or the production of a passable result when other means fail, or when, from any reason whatever, it proves impossible to follow the progress of the growth of the image by eye.

A few years back it was an almost absolute necessity to resort more or less to the system of timing, at least to the extent that it was the custom, after the image in its principal gradations had ceased to be visible to the eye in the dim illumination of the developing room, to allow a certain definite period to elapse, during which the requisite printing vigour was acquired. Nowadays, however, thanks to the greater working clearness of commercial plates, it is possible to follow the progress of development almost to its close, if not, at least, in the very highest lights, at any rate by judging the half-tones of a properly exposed picture, and comparatively little experience is required and very few mistakes are made in that department of the operator's duties.

But circumstances may arise in which it is impossible to follow in the ordinary way the gradual appearance of the image, or it may be, from over-exposure or other reasons, the gradations of the picture are, or cease to be, distinguishable to the eye at such an early stage of the process that it is certain sufficient density cannot have been secured. Under such conditions, presuming, of course, that a possibility exists of finally attaining a satisfactory result, there is nothing for it but to allow a sufficient time to elapse for the acquirement of the requisite density, such other means being at the same time adopted as the immediate circumstances may suggest as advisable; and in following this plan there is a choice of two courses to adopt, either to proceed entirely by guesswork or in the dark, or to have at least some data upon which to proceed in fixing the necessary time.

To give an instance or two of the circumstances under which the system of timing becomes useful, we may first mention an accident that occurred in our own practice a few days ago. The two plates in a double slide had received respectively a very short and a known over-exposure, the former being a shutter exposure to a not very well-lit subject, while in the other case an open landscape had been unwittingly exposed with the full aperture of the lens *f*-8, instead of, as intended *f*-32, and consequently having received in the first place sixteen times the exposure decided upon. But, to make matters worse, the over-exposed plate was by mistake placed in the developer intended for the other, consisting of an energetic solution of metol with but the slightest trace of restraining bromide. Needless to say, the image flashed out, and passed into an even tint of greyness, before there was the least opportunity of doing anything.

Having sufficient faith in the non-fogging propensities, both of the developer and in the plate in use, and also knowing the possibility with that plate of saving the picture where the mere over-exposure was concerned, the film was immediately washed and treated with a generous dose of plain bromide solution, instead of being thrown into the sink as a failure. Careful examination, both by reflected and transmitted light, showed only the barest trace of a picture, the sky line being faintly visible, and also the shadow side of a dark object in the foreground, and altogether it presented about as hopeless a prospect of making a negative as it is possible to imagine. We resolved, however, to attempt to rescue the picture, and this is how we proceeded :—

After the film had been allowed to soak for two or three minutes in the bromide solution, it was transferred to a freshly mixed developer, such as we are in the habit of employing for ordinary landscape work under normal conditions, but supplemented by the addition of three grains of bromide of potassium to each ounce, the active agent being metol and hydroquinone in the proportions given in a formula in a leading article some months back. This mixture was calculated to act as an intensifier, or to continue the development of any well-exposed portions of the picture that had already appeared, and to have less proportionate effect upon the more feebly illuminated parts, or upon the mere veil arising from the use of the previous unrestrained developer. Under the action of this mixture, the "image," such as it was, only seemed to increase in blackness and density, and the case to assume an, if possible, more hopeless appearance, the sky being lost, and the faint trace of the shadow in the foreground proving the only ray of hope.

This alone not only did not become more veiled, but, by contrast with the rest of the picture, seemed to acquire greater clearness, and at least served to prove that the intensifier was, to some extent, playing the part expected of it in letting alone the shadow. We therefore allowed the solution to act for a period as near as we could guess, for in this case, be it remarked, we had no precise data to work upon—about twice as long as that occupied in normal development—and on fixing the plate we were agreeably surprised to find we had secured a negative which, though rather "thick" and a slow printer, gives a remarkably good result in the printing frame.

On another occasion we found the system of accurate timing a distinct advantage. The work consisted in the reproduction of a number of intricate designs on such a scale that the details were utterly indistinguishable to the eye in the dark room. Here be it said, in the absence of any masses of half-tone or shadow on a sufficiently distinguishable scale, the image presented itself to the eye as an even and unbroken tint, as if the plate, or that portion of it on which the picture was, had been fogged, and at a very early stage of the development this passed beyond the point at which it was possible to judge the density either by surface or transmitted illumination. Suffice it to say that we ascertained, by experiment, the length of time required with the particular developer to give the degree of density requisite, and by working to this time in

each case a series of negatives was obtained which were practically quite uniform in character.

In this latter instance it must be observed that not only was the same developer used in each case, but the subjects were similar, and the exposures identical, conditions under which it may be supposed that the results would be uniform, if perhaps under general circumstances such were not the case. But, in another series of the same kind of work, a slightly different mode of procedure was adopted with an equally good result. In this case a quantity of developer was made up, glycin and carbonate of soda being the agents used, and this was employed for the successive development of seven negatives one after the other, the solution being lightly reinforced by the addition of a few drops of dilute ammonia for the last three plates.

In spite of the apparently hopeless absence of uniformity in the conditions of development, the only variations in the behaviour of the different plates was in the time occupied in the first appearance of the image, this rising from a minute and a half with the first development to seven minutes in the last case, in each instance the total time of development being half an hour. This we had previously found to be a peculiarity of glycin, that, under certain circumstances, though the appearance of the image may vary, the completion of development does so to a comparatively minor extent, unless the conditions of exposure are much removed from the normal. At any rate, in the series of seven plates last referred to, the seventh was a duplicate exposure of one of the others—the second or third developed—and the two results when finished are absolutely indistinguishable.

It is probable that every different developer will require some little amount of humouring or variation in applying this system, but it may be worth while to acquire a knowledge of the time occupied with that usually employed in producing a given result in order that the knowledge may be turned to account when needed as we have described.

Photographers' Copyright Union.—In connexion with the Photographers' Copyright Union, may we be permitted to make a suggestion? There are many photographers, located in out-of-the-way places and whose opportunities for taking pictures of a nature to call for copyrighting them are not for one instant to be compared with those enjoyed by many of the leading men in London or other large cities and towns. The Union, while an excellent institution, may be rendered vastly more so by the judicious opening of its doors so wide that all may enter. It was a valid objection made by "Provincial" in the JOURNAL a week since as to the want of equity in one like himself who seldom wished to make a picture copyright paying his half-a-guinea a year equally so as the big publishing photographers who dealt so largely with this class of work. Now, having been present when this Union was being formed, we have the best means in the world for knowing the friendly feeling entertained by the large London men towards the quiet provincial brother who enjoys less flourishing surroundings, and the desire that even the most humble should participate in the advantages of such a Union, and what we would suggest to the Committee to consider is whether instead of a subscription fee of half-a-guinea to all, high and low, rich and poor, the end would not be equally as well attained by the mere charge of a low registration of membership fee of, say, two shillings or half-a-crown, which should entitle all members to equal privileges, and that the working expenses be met out of a fund made up by the payment of five per cent. of all money received by members for the use of their copyright works. This, we feel sure, would far more than supply the wants of the Union, and by the large accessions to its ranks would cement photographers into unity and give the much-desired moral support to the Union.

A New Developer.—According to M. G. A. LeRoy, it is quite possible to develop a gelatino-bromide or chloride plate by aqueous solution of alkaline peroxides or peroxide of hydrogen solutions made strongly alkaline. The results, however, are decidedly inferior to those produced by the ordinary developers, and, further, the image is much reduced in intensity by hypo solution.

Interesting Experiment to Show the Inflammability of Ether.—Let a bottle be provided with a cork, fitted with two glass tubes, one a right-angled one, reaching just below the cork, and the other an S-shaped siphon tube, whose inner end reaches about half way down the bottle, and the outer or exit end two or three inches below it. Then, if enough ether be put in the bottle, almost, but not quite to touch the inner end of the siphon, the vapour of the ether will quickly pass out of the exterior end of the siphon, and, after the lapse of a little time, to permit the expulsion of the air so as to avoid an explosion, the issuing vapour may be ignited by a taper, and will continue to burn. By attaching a second similarly arranged and filled bottle by indiarubber tubing to the first, and raising or lowering it, the rapidity of flow will be under complete control.

The Inflammability of Ether Vapour.—In view of the evident growth of a desire to obtain acquaintance with the wet-collodion process by process workers and others, it will be well to give a word of warning as to the dangerous qualities of collodion. This is simply to point out, first, that the vapour of ether, and hence of collodion, is inflammable and explosive; and, secondly, that it is much heavier than air. Consequently, if there were any large surface exposed, as by a spill, or by transferring from bottle to bottle, or by coating a large plate, the vapour would not quickly mix with the surrounding air, but would fall and travel downwards. If a gas burner or a fire in a grate or stove were near, the vapour might readily ignite and cause an explosion. Another point should be noted. Any one starting to use wet collodion had better consult with the fire insurance office with whom his policy is taken out to see that his risk is covered.

Picture Exhibitions.—It is not a little surprising that photographers take so little interest in Art Exhibitions, and visit them so seldom. Yet they might often learn much if they did. In the Winter Exhibition of the Royal Academy, which, by the way, closes to-morrow, are some very fine examples of Rembrandt, lent by the Duke of Westminster, which photographic portraitists might do well to study, as well as works by other old masters, including landscapes. There is also now open the Annual Exhibition of the Royal Society of Painter Etchers. Although there is nothing about this show that is directly photographic, those who are experimenting in photographic engraving will not do amiss to pay it a visit, as it will show them what may be accomplished by the old method of etching, *i.e.*, stopping off certain portions of the work from time to time when the effect desired is secured, and then proceeding with other portions until the greatest depths are obtained.

Photographs of Extreme Ultra-violet Rays.—At the time of their publication we gave a short account of Dr. Victor Schumann's remarkable work in photographing the light rays of the smallest wave-lengths, a promise being made by him to publish further results of continued work. Though his researches more especially refer to spectrum results, they have a most important bearing on photographic operations generally. His first recent announcement is that he has greatly improved the sensitiveness and clean working properties of the plates he makes (though the process of manufacture is not described), and also much increased the facility of production. They also can be developed in strong solutions without injury, while simple immersion in pure water renders them still more sensitive to the particular rays referred to. The most remarkable quality of the plates is their singular sensitiveness to the rays that will not pass through air. Dr. Schumann finds that the results are altered and the interference distinctly traceable from the

presence of a stratum of air no thicker than ·01 of a millimetre, that is to say, less than the two-thousandth of an inch. Now, it would seem a fair logical sequence to this to infer that ordinary plates must be influenced, to some extent, by the depth of the stratum of air between lens and object, and that some such effect might explain apparent vagaries of exposure in photographic practice.

Disreputable, if Correct.—In the last issue "Cosmos" makes a serious insinuation—indeed, charge—which, if true, is a disgrace to those concerned. "Cosmos" says that, to his certain knowledge, some of those whom the Photographers' Benevolent Association has helped to set upon their legs with gifts and loans, and who are now earning more or less good livings, haven't the common gratitude—he might almost have said honesty—to pay back a single penny of what they had received for the benefit of others who may be, and are, in straits similar to which they once were in themselves. If this be true, it is a standing disgrace to them. The Committee of the Association may therefore do well to consider whether, in making grants in the future, they should not be made by way of loan, in such a way as to be recoverable if the recipient gets into a position to repay it. If such a regulation was made, subscribers would have the assurance that the Committee, whose object is charity, would never enforce a claim unless they were sure that the one who received it was in a position to refund.

Another Art Exhibition in the City.—The Art Loan collection of pictures will be inaugurated at the Guildhall on the 20th of next month. It will be open to the public on week days from ten till seven o'clock. The Court of Common Council have this year decided that the Exhibition shall be opened on Sundays between the hours of three and seven. The Sunday opening of this Exhibition has always been a vexed question with the Council. Last year, in the first instance, it was decided by a narrow majority that it should not be opened; but, at a subsequent meeting, the question was reopened, and it was then decided by a very narrow majority that it should be opened on *alternate* Sundays. As a result, on each of the six Sundays it was open it was visited by an average of about 3000 persons a day. The Council were congratulated in most quarters on the result of the innovation, and that has decided them to have it now open every Sunday. We are glad of it, as now thousands, whose daily avocations would otherwise have prevented them, will now have the opportunity, if the show is up to the average, of seeing some of the finest paintings to be seen in England, and which are not to be seen by the public at any other time.

To Test Collodion for Methylated Spirit.—It used always to be considered that collodion made with solvents free from methylated spirit was better, and permitted the bath to remain in working order for a longer time. If it be desired to test collodion as to its freedom from methylated spirit, it may be best done perhaps by the nitro-prusside method. Dilute a small sample of the collodion with a little water to throw down the pyroxyline, and then to the clear liquid, obtained by removing the clot, add an equal bulk of a one per cent. solution of nitro-prusside of sodium and a few drops of ammonia. If methyl alcohol be present, there will appear, in a quarter of an hour or less, a distinct red colouration. In some collodions the "sensitising" solution is usually where we must look for the cheap spirit to test, for which it will be desirable to distil a small quantity. This can be done readily enough by connecting two test tubes lightly together with a short length of glass tube and cork, and placing a little of the suspected solution in one. Upon immersing this tube in a basin of boiling water, and the other in one of cold, sufficient alcohol for the required purpose will quickly distil and collect in the cold tube. We describe this extemporaneous method for the inexpert rather than one which would involve the use of a naked flame and the risk of an explosion.

Lectures on the Chemistry and Physics of Development.—At the Cordwainers' Hall, on Monday night, the first of two lectures, given under the auspices of the Affiliation of Photographic Societies, on *The Chemistry and Physics of Development*, was delivered by Mr. Bolas. Sir H. Trueman Wood occupied the chair, and there was an excellent attendance. The lecturer experimentally demonstrated and explained the electrolysis of water and silver nitrate solution by continuous and alternating electric currents, and, having referred to Schnauss and Cherrill's theories as to the assumed electrical action set up on sensitive salts by exposure and development, demonstrated thermolysis, *e.g.*, decomposition by heat, evolving oxygen from red oxide of mercury in explanation of the action. He next referred to Clerk-Maxwell's view of light as likely to supply the key of our knowledge of the subject, and dealt at length with the experiments of Oliver Lodge and Hertz on light as what might be termed the radiant side of electricity. The flash from a Leyden jar was not to be regarded as a continuous flash, but as a great number of sparks. These electrical radiations Hertz had demonstrated possessed the same characteristics as light. After other experiments, Mr. Bolas concluded the lecture by remarking that the production of light without the aid of an incandescing substance was a problem which was probably destined to be solved at an early date, and said that then sufficient light might be produced for the taking of a portrait by no more labour than a child expended in spinning a top. The second and concluding lecture will be given at eight o'clock on Monday evening, March 18.

Artificial Light in Photography.—On the occasion of a demonstration of portraiture by artificial light before the members of the Croydon Camera Club, the President, in pointing out the advantages of artificial light over daylight, as regards availability, took the opportunity of chiding English photographers on their want of enterprise. He is reported to have said: "The slowness of many English professionals in using means now at their disposal for quick delivery of work contrasted with some American firms, who actually guarantee to take your portrait in the evening and deliver a dozen copies by breakfast time next morning!" We are continually being told extraordinary tales of Yankee enterprise, and we do not question that referred to. The thing is quite possible, but what does it mean? Why, that retouchers, printers, mounters, &c., must be working all the night, and *cui bono?* Who wants to sit for their portrait at tea time, and have a dozen prints served up with their toast at breakfast next morning? Some short time ago we received a letter from a correspondent, an operator, commenting on the introduction of artificial light, and the long hours it entailed upon *employés*. In effect, he said that the hours of an operator used to be from nine in the morning till dusk, dusk being somewhere about three or four o'clock in winter, and six or so in summer. Now, where artificial light is adopted, the hours extend to nine or ten at night, and, on special occasions, some time well into the small hours of the morning; and this, generally, at the season of the year when the hours used to be the shortest. Our correspondent's chief complaint was, that while unskilled labour was clamouring for an eight hours' day—and getting it—skilled operators were having their hours of labour greatly increased. However, where sittings are given in the evening, and a dozen portraits delivered next morning, as referred to by the President of the Croydon Club, a special night staff is, doubtless, employed.

Lessons of the Frost.—In few businesses does a curtailed water supply cause greater inconvenience than, perhaps, in photography. The past few weeks of severe, almost Arctic, weather have taught us several lessons, and it remains to see if we shall profit by them in the future. In the first place, few so fully realised how serious a matter it is, either in the household or the workrooms, to be without water, except such as has to be fetched from a distance, and even then be paid for at famine prices. Again, few knew how little water they could make shift with when compelled to do so. One of the greatest lessons, however, has been to show that with a few timely precautions much of the inconvenience lately experienced could have been prevented. Frozen pipes, within the house, might have been avoided by the simple contrivance we suggested at the advent of the frost. The pipes having frozen, many floodings migh

easily have been saved had, as we also advised, the pipes been carefully examined to see if they had become fractured, and, if so, repaired at once. It is, however, in the supply to the premises being frozen that the most serious inconvenience has been experienced. When this has occurred in the Company's mains, of course the consumer could not help that. In nine cases out of ten, however, the stoppage has been between the mains and the house, through the pipes being laid too near the surface. But how many will at once remedy this? We put this query as we recently passed through a road in the suburbs that doubtless owes its existence to the "jerry builder," where burst pipes seemed to be the order of the day. In every case we noticed that the pipe was laid well within a foot of the surface, and the new pipe, "iron barrel," was being replaced in the old position, to be again frozen and split on the occurrence of the next severe frost. We fear that the lessons recently learnt by many photographers, to their cost, will be quite forgotten by some before next winter sets in, when the trouble may again be repeated.

FURTHER NOTES ON A MODIFIED EMULSION.

Since the article in The British Journal of Photography for December 21, upon *A Modified Emulsion for Process Work*, was published, I have had brought to my notice numerous instances of failure on the part of those trying it, many of which were simple enough in their origin; but several were from unexpected and more obscure causes, and required some investigation to ascertain what was wrong. I propose to deal briefly with these troubles, as there are possibly many more who may encounter them, and so be prevented from employing what is undoubtedly a simple and easy process for negative production. I am afraid I must plead guilty to having unwittingly led some into trouble by a statement made in the article referred to. I stated that methylated alcohol would do, "nor did the recent addition of mineralised naphtha appear to affect it disadvantageously." This statement I since find requires considerably modifying.

In my own practice I had been in the habit of using the ordinary methylated alcohol, as obtained of a good dealer in chemicals, and have never had any trouble from that cause. It would appear, however, that there are some samples which are not suitable for the purpose if treated exactly as described, and that the new methyl is a very variable and uncertain factor. A correspondent was kind enough to forward me a small sample for examination. The emulsion appeared properly made, but was of a red colour, which seemed to indicate the presence of red silver bichrome. But this red colour was not eliminated by the addition of more bromide, even to a very large excess, and a plate coated and washed gave not the vestige of an image, no matter how prolonged the exposure. It was evident, therefore, some other reaction had taken place. I need not detail the course of experiment taken to ascertain what this was, but simply state that it was traced to the action of silver bichrome upon the mineral naphtha of the sample of methylated spirit employed, and that neither free nitrate of silver, nor alkaline bichrome alone, had any such effect. It would appear from this that silver bichrome—a very unstable and loosely combined salt—acts as a much more powerful oxidiser than potassium or ammonium bichrome. The result is that in the emulsion the mineral naphtha is oxidised and the silver bichrome wholly and partially reduced to insoluble chromic oxide, and an organic salt of silver. These are not eliminated by the subsequent washing of the plate, which thus remains absolutely insensitive to light.

Knowing the cause, the remedy is obvious, and I will point out three methods which may be adopted. The first which would naturally occur is to get another and better sample of alcohol, or procure, where possible, some of the old methylated spirit, containing methyl alcohol, or wood spirit only. This, however, is not always convenient, unless considerable quantity is required. Another plan is to let this reaction take place before making the emulsion; in other words, destroy the mineral naphtha first and filter off. This may be effectually and thoroughly accomplished as follows: In a test tube dissolve five or six grains of potassium bichrome in a drachm or two of water, and add a solution of silver nitrate drop by drop as long as a precipitate is formed. Allow this to settle, and drain off the water as closely as possible, and wash in a drachm or two of alcohol to get rid of the water. Add this to the ten ounces of alcohol with which you are about to make your emulsion, and, placing in a bottle in a pan of water, as described before, bring it to a boil for a few minutes. Then pass through good filter paper, and proceed to make the emulsion. This is undoubtedly the best method to adopt, but, simple as it is, may be too much trouble for some to encounter. The following method is even easier and simpler, and will also effectually prevent the trouble. As previously stated, neither potassium bichrome nor silver nitrate alone have any reaction upon the new methyl, at any rate at ordinary temperature. If, therefore, the emulsion is made as described, allowed due time to ripen with excess of silver, then add the necessary bromide to convert the free silver nitrate to silver bromide, and, last of all, add the bichrome as described. The quantity of cadmium bromide required in the formula given in the recent article would be about 100 grains. By this means no silver bichrome would be formed, and therefore the reduction would not take place, whilst the emulsion would have all the useful properties it would have had if made as previously directed.

A word or two might here be said about the sensitiveness to light of the emulsion, accounts of which are somewhat conflicting. The cause of insensitiveness will be found in one or other of the following: (1) Too great an excess of bromide added, and (2) too much bichromate solution. It is well known that the action of bichromate and bromide in solution is to destroy any image or reduction made by light, or other cause, in a sensitive substance, and it is surprising the small quantity required to do this effectually in a collodion emulsion. The greatest care should therefore be taken not to exceed the quantity required to just neutralise the free silver, and also the same may be said of the bichrome. This latter may be reduced to two or three grains to the pound of emulsion with advantage, but would then require longer to recover from the fog induced by light or over-ripening, and more care required to keep the bulk of emulsion from white light. Too much excess of free bromide and bichrome will make a brilliantly clean but very slow emulsion. Another cause of slowness is in the too great haste of the beginner in emulsion work to complete mixture. Old emulsion workers well know the great increase in sensitiveness, brilliance, and cleanly working which takes place during the period which is termed ripening. I need not go into the why and wherefore of this, but simply state that, the more thoroughly this ripening is allowed to go on before finally finishing the emulsion, the better and more rapid the finished product. Like any other action, however, this can be hastened by heat, and, if accustomed to chemical manipulation, by taking care not to waste the volatile solvents, but arrange for their condensation and return to the bottle, the emulsion may very advantageously be boiled, and the same result obtained in a few minutes as would require a week at ordinary temperature. It must be remembered, however, that, after the addition of the bromide and bichrome, no further gain in sensitiveness will take place, and rapidity in such a case must be got by other means to each individual plate.

Pyroxyline.

The most common cause of complaint, however, which I have come across is entirely due to the quality of the cotton used to make the collodion. There is a large quantity of very insoluble cotton at present in the market, more especially in the provinces, where the local chemist is depended upon for a supply. I have procured several samples from various sources, and all are totally unfit for photographic work of any kind. When put into ether-alcohol, this cotton swells up, becomes glutinous, and refuses to thoroughly dissolve, except in very small quantity, and gives a collodion difficult to flow over the plate, setting unevenly and full of insoluble particles. It would almost appear at first sight that since the advent of gelatine the making of pyroxyline had become one of the lost arts. There are, however, many reliable samples to be obtained, if only dealers of repute were applied to. In the Lantern Supplement to The British Journal of Photography of February, Mr. W. B. Bolton refers to this subject fully, and I need add no more. There is an alternative, however, involving perhaps a little trouble, but at the same time avoiding a good deal of expense and trouble afterwards, and that is, whenever there is difficulty in procuring suitable pyroxyline, to make it. It is quite as easy and simple as any other photographic operation, and is the plan I have therefore adopted for some years, substituting, however, paper for cotton, as being easier to prepare, more fluid in the collodion, adhering tenaciously to the glass, and giving a much tougher film than the cotton.

If there are any of your readers who care to go to the small extra trouble involved, the following simple method will be found to give a good and reliable papyroxyline; and, as the method differs in several important points to the generally published formula, it will perhaps interest others. A word or two, first, as to the nature of pyroxyline. It is what is termed a substitution product of cellulose obtained by the action of sulphuric and nitric acids upon cotton, paper, or other form of pure cellulose, which act by abstracting one

or more atoms of hydrogen and substituting an equal number of molecules of nitrous acid. Nitric acid alone is not sufficient to produce the necessary reaction. The use of sulphuric acid is, first, to harden or parchmentise the cellulose, and next, by its strong affinity for water, to abstract all the water from the acid. The true constitution of nitric acid is, one molecule of nitrogen pentoxide and one molecule of water, which combine together to form two molecules of nitric acid, thus:—

$$N_2O_5 + H_2O = 2HNO_3$$

By the addition of sulphuric acid this water is absorbed and N_2O_5 left, and the mixture may be said to be a solution of gaseous nitrogen pentoxide in diluted sulphuric acid. The N_2O_5 in contact with the cellulose is split up into two parts, NO_2 and NO_3, the former displacing an atom of H from the cellulose, which immediately unites with the NO_3 to form nitric acid, HNO_3, the nitrous acid, NO_2, uniting with the cellulose to form pyroxyline. Now, the uncertainty attending the making of a soluble sample is caused by the difficulty of knowing how far to carry this action, for, if not carried far enough, the outside of the substance is changed, leaving the interior portion only partially nitrated, and consequently insoluble; or, if carried too far, an explosive sample is formed, which is also partially insoluble in ether-alcohol. With cotton this difficulty can only be overcome by practice and minute attention to detail. With paper, however, as I will explain, this is not so much the case, for a visual test is present of the right time to stop the process. What is required is to stop the action as soon as the right amount of substitution has taken place. The right quality of paper was also formerly a difficulty to contend against, as any sizing or impurity present was sure to cause either the loss of the whole batch by solution in the acid, or an inferior product was the result. There is to be obtained now, however, from almost every paper dealer, a kind that is eminently suited for the purpose, inasmuch as it has already undergone part of the required treatment. I refer to the parchment paper, such as is used so extensively by grocers and provision dealers to wrap their goods in. This is already parchmentised, and contains, therefore, no sizing or other injurious foreign matter, and is just in the condition to be easily acted upon by the nitrous acid. It is worth while taking a little trouble to get the thinnest sample possible; it can be got only slightly thicker than tissue paper. Having procured this, proceed as follows:—

Take a porcelain dish, such as is in use in all photographic establishments, for fixing, toning, &c.; have it thoroughly clean and fill with hot water, to make the dish hot. Now cut up the paper into such a size as will easily go into the dish, leaving a margin all round of about an inch for moving freely about. See that the paper is quite dry. Have ready also two strips of stout glass for immersing and moving the paper in the acids. Two half-plate glasses will answer the purpose. Now empty the hot water out of the dish, and put into it at once

Sulphuric acid ..... 10 fluid ounces,
Nitric acid ..... 8 „ „

and stir with one of the glass strips till thoroughly mixed. At once proceed to immerse the sheets of paper, first float so as not to enclose any air bubbles, and then press down until totally immersed, using, of course, the glass strips for this purpose. Any air bubbles must be got rid of before putting the next sheet in. Proceed then with the next in the same way, until you have about a dozen pieces immersed. More than this number it would not be wise to attempt at once. Keep them moving about for five or ten minutes after the last sheet is added; then, inserting the glass strip right under the lot, and holding them by the other one, lift out and turn the lot over, so bringing the first sheet to the top. Now lift up the first sheet and examine it. It will have changed considerably in appearance and character, becoming stiffer and stronger, and, what you must observe more particularly, it will be much more transparent-looking. Keep the lot moving about until all opaque—or semi-opaque patches—are gone, and the whole lot is perfectly transparent, almost as clear as glass. When this takes place, the action is complete and the paper nitrated through. Now take them out by the two strips of glass sheet by sheet, and immerse in a large quantity of cold water. A second lot of paper may be now proceeded with in the same acids, and after that even a third lot, proceeding precisely in the same method as at first, only that the process of nitration becomes slower each time. If you leave it till perfect transparency is reached, however, the results will be good. As for the time required, it will necessarily vary according to the thickness of the paper employed, but each immersion will average from twenty minutes to an hour. The last batch may even take three or four hours if the temperature has fallen or the paper be at all thick. The papyroxyline then requires washing in running water for an hour, and hanging up to dry, and is then complete. The acids, when exhausted, should be utilised by placing in a dish and diluting with water, for cleansing old glass negatives, &c. Papyroxyline is best kept in a cardboard box and not in corked bottles. An old dry-plate box would be useful for the purpose. I have purposely omitted all mention of temperature, specific gravity, &c., in the above instructions, as such matters by this method are really of secondary importance, and only tend to complicate matters and bewilder the beginner. If the acids are bought from any reliable chemist a little difference either way will not interfere with the result, if other things are attended to.

Development.

In my previous article I did not dwell upon the subject of development beyond stating that any developer which would answer for ordinary dry plates would also be suitable for this process, but with a freer use of restraining bromide. It is scarcely necessary to say that, although this is intended for use as a wet process, yet the ordinary ferrous-sulphate and acid developer in use with the silver-bath process would here be of no use. Ferrous oxalate, hydroquinone, or any other of the alkaline reducers, will, however, answer well. I should like, however, to draw attention to one which I think is too much neglected, where density and clean shadows combined are of primary importance, as in process-work negatives. I refer to the power which a solution of gallic acid exercises when added to a solution of pyro, in restraining fog and giving brilliance. Whether employed with collodion emulsion or the ordinary gelatine dry plate, it is of the greatest value as a clean, density-giving developer. Let the pyro be dissolved in a two-grain solution of gallic acid instead of water, and use carbonate of potash or soda solution for the alkali.

Chemically, gallic acid is pyro, and carbon dioxide (CO_2), and this CO_2 appears to act powerfully as a retarder of reduction where the light has not acted, but does not prevent the pyro completing the development wherever reduction has been started by light. If the reader will try the following formula, either for dry plates or wet emulsion, I think it will give satisfaction.

Take one ounce of gallic acid. Of this weigh out six drachms, and add to one fluid ounce of glycerine in a thin boiling flask. Place this upon a sand bath or other convenient means of heating, and apply heat until effervescence takes place. A copious evolution of CO_2 occurs, and the gallic acid is entirely converted into pure pyrogallol dissolved in glycerine. When the effervescence ceases, take the solution and make up to forty ounces with water, and add the remaining two drachms of gallic acid. Now add two ounces of sodium sulphite and shake till dissolved. In another bottle dissolve four ounces of carbonate of soda and sixty grains of potassium bromide in forty ounces of water. For use, take equal parts of each.

This will be found to work clearer and better than if made with ordinary commercial pyro, and brings out rapidly all the work that the light has done, and development may, where necessary to bring out detail, be prolonged considerably without any fear of fog or veil.

Edwin Banks.

FROM SUNSHINE TO SHADOW AND BACK.

II.

Attention has already been called to the fact that halation, to be visible, requires that the negative representation of some more or less bright object should have reached, or passed, a considerable degree of density. But, before development, we have what we call an invisible image, concerning which theorists argue that it is of the same nature as the visible image which, later, light can produce alone. Now, we know for a certainty that the visible light-produced image is of chemical formation, for, when a dry-plate film, in a printing frame, is exposed for a long time to sunshine, plate, pad, and frame are strongly impregnated with the odour of bromine; and the same smell is distinctly perceptible to ordinary nostrils when a virgin film is warmly breathed on in the light of day. As this implies reduction of the silver salt, it would, *à priori*, seem reasonable to assume, as many have done, that the invisible, developable image, and the visible image are identical in constitution. But, going a little deeper into the matter, we observe that, whenever the same developer that reveals an *invisible* image as a dense negative is brought to bear upon a visible one, it does not—save under altogether exceptional conditions, to which I shall presently refer—*continue* the action of light as hitherto understood, but *remains inert*. The developer does not

reverse the action of light, neither does it reverse the effect which light has initiated. On the visible image, at a certain early stage of visibility, it simply *refuses* to work, and leaves it *in statu quo*. There has been a disturbance of the equilibrium requisite for the attainment of normal density by ordinary development, and consequently we must accept abnormal density as inevitable, or resort to more or less extraordinary development. It is of extreme importance to realise that, constancy being maintained in all things save duration of exposure and potency of developer, we can, at will, make *any form of image* the criterion by which to gauge the degree of precision of the balance. For any form where this balance is maintained there can be no over-exposure or under-exposure, neither can there be under-development or over-development, these terms everywhere implying imperfect inter-equivalence. This fact is apparent to those who can thoroughly understand that all "correct" or "well-timed" exposures are necessarily referred, actually or in imagination, to a definite immersion in a given developer; and, conversely, that no plate can be "properly" developed which has not been "properly" exposed.

The application of the developer, from this point of view, may thus be compared to the finding on the focussing glass the position of the posterior focus of any object when its position and that of the lens are fixed. Similarly the determination of the exposure may be regarded as the distance to which a bright object must approach, or from which it must recede, in order to be sharply focussed on a ground glass, rigidly connected with an immovable lens attached to a camera in a fixed position. In this case also we have an example of a balance perpetually maintained by two inversely proportionate inter-equivalent functions.

We should now be able to see how it is quite possible to have a reversal of the image without any reversal either of the action of light or of that of a developer, without oxidation replacing reduction. Thus, *cæteris paribus*, considering light as the only variable, we perceive that there is a certain amount of light, which produces a certain effect, which can have only one result. If we fall short of, or exceed, this *lucis quantum sufficiens*, we can no longer have the same effect or the same result. If the amount of light which has reached a certain portion of the plate, under conditions of manipulative detail which we assume to be invariable, is such as to allow of the formation of, say, 0·5 density, this density will be producible all over the plate, even when the range of light and shade in the subject is great and the gradation subtle. Let our unit of light intensity be the quantity of light received upon unit surface in unit time. Further, let us assume that one intensity, acting for ten seconds, produces the same effect as ten times that intensity acting for one second. Then, photographing a scale of 0·1, 0·2, 0·3, 0·4, 0·5, 0·6, 0·7, 0·8, 0·9, and 1 intensities, we believe that at the period when intensity 0·5 has induced that condition in the film which allows it to develop to 0·5 density, intensities 0·4, 0·3, 0·2, and 0·1 will have had a less effect. But we feel certain also that, with longer exposures, the lesser intensities could produce equal results in the undeveloped film. Equally sure are we that intensities 0·6, 0·7, 0·8, 0·9, and 1 have already produced a greater effect. Now, before the plate is developed, let us take it for granted that in one second intensity 1 has induced the power of developing to density 1, which, for the time being, we will consider the greatest density of which the film is capable. Let us now, this instant, put on the cap of darkness. Too late! What do we mean by "too late?" This: Intensity 0·9 has usurped the power which but a moment ago was possessed by intensity 1. Intensity 0·8 has taken the place of intensity 0·9, 0·7 that of 0·8, and so on down the scale. What has happened at the top of the scale? Intensity 1 has over-reached itself. It has done something more than acquire the power of gaining maximum density. What?

Let us hark back. In, say, 0·05 second intensity 1 had induced in a certain region of the film 0·5 of the power, to darken which in 0·94 second more would be its characteristic action. In 0·056 it had commenced to do something more than merely acquire density. What? This: It has already imparted to the salt particles in its immediate vicinity a power to darken (at one edge, at least) over and above that which was theirs by virtue of intensity, 0·9 acting for the same period—that is to say, in a given fraction of the time (in this case $\frac{1}{18}$) in which intensity 1 could impart the power of developing to density 1, it had induced in the film the force to gather density 0·5, and also that, at this point, development can bring out a *visible* halo. From what we have said before, it likewise follows that, when with an exposure of one second, intensity 1 can cause the corresponding part of the film to darken under the developer to density 1, intensity 0·05 will simultaneously have imparted to the part of the film which receives its action the power to darken to density 0·5.

Before proceeding to investigate the reflex action exercised by one portion of a film which has received most light upon its immediate surroundings, and the condition of mutual inter-dependence which, I think, is implied thereby, let us glance at the nature of the modifying influence exercised by developers characterised by a greater or less degree of alkalinity.

In this cursory examination let us adhere to two restrictions as to the sense in which we may use the terms "ratio" and "period."

Ratio shall mean only the proportion existing between the density produced and the exposure which allowed the developer to produce it.

Period shall mean only the time which has elapsed from the commencement of the exposure.

The subject to which we shall expose our film will again be our scale of decimal increments of intensity.

We have, let us say, previously given the same exposure as we are about to employ, viz., x seconds, and have already, with an immersion of one minute in a standard developer,—

Pyrogallol	2 grains,
Ammonia (·880)	2 minims,
Ammonium bromide	0·1 grain,
Water	1 ounce,

produced a flat, monotonous degradation of the film, a "no-image" representation, absolutely devoid of detail (if we except the trifling matter-of-fact detail that 0·5 density stands for 0·5 intensity).

Now, if we admit that one intensity, acting for ten seconds, produces the same effect as ten intensities acting for one second, we must acknowledge that—

Intensity.		Time.		Effect.
0·1	×	1·00	=	1
0·2	×	5·0	=	1
0·3	×	3·3	=	1
0·4	×	2·5	=	1
0·5	×	2·0	=	1
0·6	×	1·6	=	1
0·7	×	1·42+	=	1
0·8	×	1·25	=	1
0·9	×	1·1	=	1
1·0	×	1·0	=	1
and conversely				
10·0	×	1·0	=	10, etc.

On this assumption, namely, that light-intensity and duration of exposure are reciprocals, we are at liberty to deduce that the amount of light reaching unit surface from unit source, is, for parallel rays, a function of the period, and can be accurately stated in terms of time, expressed in any unit we may select.

Hence, if we find that—

1. Exposure 0·27 seconds = one mean density,
2. „ 5·00 „ = normal negative,
3. „ 90·00 „ = neutral phase,
4. „ 1620·00 „ = reversal,

we can take 0·27 seconds as our unit of time and write—

Exposures.		Densities.		
1. 1	=	0·5	+	halation.
2. 18	=	1·0	+	halation.
3. 324	=	0·5	+	0·5.
4. 5832	=	0·0	+	1·0.

Now, although from a constant source, at a fixed distance, ten times more light falls on the plate in ten seconds than in one, the amount of density which development produces is never at any time directly proportional to the duration of the exposures. The amount of silver reduced upon unit surface of the film is at no time what we would naturally expect, but is in one spot less, in another more, at different periods.

HUGH BREBNER.

(To be continued)

CHILDREN'S PORTRAITURE.

[Leytonstone Camera Club.]

SOME few weeks ago your persuasive Secretary did me the honour of calling upon me to request my presence here to-night, that I might have a pleasant little chat with you upon children's portraiture. Although not personally acquainted with the members of this Club, I am not uninformed of the excellent work done by it, or that its Exhibition stood in front of any other out of London. To-night I have a few general remarks to

make upon a number of points where I think amateurs are sometimes deficient; but I would ask you to remember that these are only *my* ideas, and I am fully alive to the fact that others, and, no doubt, some here, could correct me upon many points. That the professional leaves the amateur behind in portraiture I must candidly confess; though, whether he would still win the race of compelled to work under the alarming difficulties which almost all amateurs do, I am doubtful (I should mention that the "really skilled" amateur is here contrasted with the "really skilled" professional, dabblers and triflers, on the one hand, and caricaturists on the other are passed over). The amateur, has however, one great advantage, he is not limited to time in production. Seeing that this is so, I have always felt the result of the race ought to be more equal, and, if any of these remarks tend to make it so, I shall feel extremely gratified.

To commence with, I think that no one should follow the study of portraiture unless they feel that it gives them pleasure to do so. I am a decided advocate in photography with its wide-spreading branches of every student having his own special class of work. To no other subject does the saying so thoroughly apply "Know something of everything and everything of something." Too often, I am afraid, the first half of the sentence only is acted upon.

But it often happens that an amateur feels a desire to go in for portraiture, but has not the proper articles to use. This is quite reasonable, but I think an exaggerated idea exists as to what ought to be possessed for the production of good work. To begin with the background. Well, a background is certainly desirable, though it not unfrequently happens that a far more natural background is possessed already in the garden or the drawing-room. Still a plain or graduated background should be got which is suitable for almost every class of work. It should not be dark.

Then the accessories. Accessories, unless exceptionally well made, are most suitable for firewood. As a general rule, all accessories except such as are to be found in every household (as the advertisements say) are much better avoided, but care must be taken to choose such chairs, screens, &c., having a photographic value in harmony with the subject under consideration.

Mr. Arthur Hands then went on to say: "We should remember there is a poetry around childhood, which aids the artist in appealing to the minds and hearts by his picture, which, I take it, is the endeavour of each member here."

Then, again, children's pictures admit of far more ornament than adults, and an infinitely wider scope for his power is presented to the thoughtful photographer.

The current issue of the *Photogram* has a word or two upon the subject; it says, "Amateurs who are weary of a landscape, *Reedy Waters*, &c., may well turn their attention to figure work, by which they will learn some sympathy for their professional brethren."

Last, but not least, there is the fact of their entire confidence in you, which, I am afraid, an amateur's adult friends do not always possess, for this very name "amateur" to some minds means incompetent, however ridiculous that may be. Here, then, I think we have a final and conclusive reason why "children's portraiture" should be essentially an amateur's study. The whole subject specially commends itself to them, and I would strongly advise those here who feel *inclined* for such work to strike boldly out in this direction, for a gallant reward awaits their effort.

After some considerable remarks upon studios (day and electric light), Mr. Arthur Hands spoke of plates and the unsatisfactory state of speed determination. He then pointed out the necessity of rapid working when photographing children, and the advantage of sketching out as much as possible your intentions beforehand, though not necessarily binding oneself to them.

Later, Mr. Hands said: "The character of children's portraiture is generally missed. Softness, extremely delicate, is what we require; too often hardness and stiffness is what we get. He pointed out that there is only one thing that makes a graceful child unnatural, and that is being photographed. This difficulty the skilled photographer gets over by never allowing his model to know much about it, and by entering into child life leads its mind away from the terror of the dreadful black cloth and great eye to more pleasant themes. In all classes of portraiture I cannot over-estimate the value of the influence of conversation on the model. A portrait photographer should always be a good talker and a good listener.

Posing is a necessary evil; it should be used sparingly, and only by those who have had experience.

Nothing is more conducive to bad work than a number of friends (?) assisting in the posing, the result generally being a victim having the appearance of a trussed fowl.

Another point which I don't think we always remember is, that, whilst shadow effects are suitable for old faces, light effects are most suitable for young ones.

With reference to lighting, it should be brilliant, but not too strong; of course, in accordance with the idea of the study. Many pictures are spoiled by the novice, by putting a child with blue eyes, so beautiful in nature, to look towards the light.

In conclusion, Mr. Arthur Hands said: "I am glad to see that judicious retouching is fast gaining ground again, and the supporters of the so-called 'pure photography' are settling down to the idea that 'to the pure all things are pure.' Personally I do not agree with a great deal of retouching, but I could place no limit to it, as I should describe retouching as a method of increasing the artistic value of the picture, without losing the likeness or disclosing the means, and this is purely a matter of individual taste.

"I have thus briefly rushed through my own method of working, speaking to you as those who have found the best plate and the best developer, and are content to use the tools that are provided you for the interpretation of nature." ARTHUR HANDS.

PHOTO-MECHANICAL PRINTING PROCESSES.*

WE have now to speak of that other group of processes in which not only are the printing plates prepared by photography, but the methods of printing are new and peculiar. There are two of them, the Woodbury-type and the photo-gelatine process. For a description of the Woodbury-type I shall take the words of Mr. Walter E. Woodbury, the son of the inventor, who, I am happy to say, is now a resident of this country, and the editor of the *Photographic Times*.

"In this a glass plate is coated with collodion and then with bichromatised gelatine. This is exposed under a negative and afterwards washed in warm water, which removes the soluble parts, leaving the image in relief. When the gelatine relief is dry it is exceedingly hard, and is stripped from the glass support and pressed into a sheet of lead by hydraulic pressure. By this means an intaglio mould is formed. This is placed in a specially constructed press having a heavy and perfectly true lid. A little warm gelatine solution containing any desired pigment is poured on to the intaglio mould previously greased, a piece of prepared paper laid on the top and the heavy lid brought down and clamped firmly. This squeezes out the excess of coloured gelatine, only allowing that to remain which lies in the depressions of the mould, which sets and at the same time adheres to the paper support. The paper when removed has in this manner a gelatine image attached to it, which is dried and hardened with chrome alum. If glass be employed instead of paper, very beautiful transparencies or lantern slides can be made."

To this description I would like to add a word of regret, that this beautiful process is not in common use; and a word of hope, that it may be utilised for the production of coloured lantern slides for the Ives process.

In Europe, collotype is the name not infrequently given to the group of photo-gelatine process, Kollos being the Greek word for glue or gelatine; but gelatine is the English of it, and I fail to see any good reason why my nomenclature of photo-gelatine—which is the common-sense one—should not be adopted.

Photo-gelatine covers a multitude of names: Albertype, Heliotype, Artotype (barbarous name), Lichtdruck, Indotint, Autoglyph, and I don't know how many more, but they all mean about the same thing, and that is, printing by the lithographic method from a surface of bichromated gelatine which has been acted on by light through a negative. Referring to the method of printing as being new, it is true the principle of lithographic printing—that is, the repulsion of grease and water—applies to the printing of photo-gelatine plates; but, in practice, the method differs so greatly from that of lithographic printing, that I am justified in calling it a new and peculiar method. The photo-gelatine process in common use consists in the preparation on a glass plate of a layer of bichromated gelatine on which light is allowed to act through a negative. By exposure to light, the parts where light has acted strongly are rendered waterproof; they do not any longer absorb water, the parts where light has acted not so strongly only partly absorb water, while the parts where light has not acted retain their normal property of absorption. Consequently such a plate, being sponged with water, absorbs it variously, and in parts not at all. In those parts where it has not absorbed water at all, there is no reason why grease should not adhere, and it does adhere. Where water is partly absorbed, grease also partly adheres, whilst, where the gelatine has fully absorbed the water, grease will be wholly repelled. Lithographic ink is grease with colour added to it, and a roller charged with such ink, and passed over such a plate after it has duly absorbed its quota of water, speedily reveals the light produced image. The picture so produced is transferred by pressure to paper, and the operation repeated. Of late years power presses have been used in the production of photo-gelatine work, both in this country and abroad.

* Concluded from page 107.

The last decade has seen the rapid development of the production of photographs in printers' ink, and the application of photography to the printing press. The next decade will see the rapid development of the production of photographs in their natural colours in printers' ink, and the application of photography in natural colours to the printing press. I venture the prediction that this result will be attained by that three-colour process, which, though now only in its infancy, is producing the most remarkable results the world has yet seen.

It is well understood that there are only three primary colours, yellow red, blue. From varying combinations of these three, all the colours in nature or in art are constructed. The possibility of the application of photography to the reproduction of colours on these lines was propounded long ago by the fathers of photography, and in the early history of the art it was suggested that three negatives should be made, each representing one of the primary colours. There was one difficulty that had first to be overcome. Till a comparatively recent date photography was unable to give correct colour values; we all know that yellow, which in nature is light, was reproduced as dark, whilst blue, which in nature is dark, was reproduced as light. Thus photography did not reproduce the correct relations of light and dark, but gave an entirely different rendering of them. Of late years, the advance in the science has enabled us to secure results giving the true or orthochromatic effects. As soon as this became possible, it became also possible, by means of coloured screens, to exclude either of the three primary colours from the action of light in the formation of a negative. The three-colour process is based on this power. Three negatives are made, one through a coloured screen allowing only the red rays of the spectrum to pass, one allowing only the blue rays to pass, and a third transmitting only the yellow rays. These three negatives, each representing a primary colour, are printed in the three primary colours, and superimposed. Just as the three primary colours give all combinations of colour, the superimposition of the pictures should give all their combinations. It does so, not perfectly, but approximately; approximately only, for various reasons. In the first place, the colour screens, or ray filters, being, of necessity, of artificial colouring matters, can only approximate the true colours of the spectrum. Again, the pigments used in the reproduction of the prints are only approximate and imitative. After all, pigments are only man's efforts to imitate nature. Can an artist do more than imitate nature? Is the blue of the artist the true blue of the sky? How can photography, using the same pigments, be expected to approach nearer to nature than the artist? Again, is it necessary always to insist on an exact facsimile reproduction, and, failing this, to say that the process has failed and is no good? Take the case of the reproduction of a painting—is a photogravure of it a failure because it does not reproduce any of the colours of the original? Then, why should a three-colour print be a failure because it does not reproduce exactly all the colours of the original? It seems to me that a three-colour print, if it is pleasing and harmonious in colour, gives to-day the truest rendering of the artist that has yet been achieved.

Perhaps the most formidable difficulties yet to be overcome are in connexion with the printing of the plates, whatever the process that may be employed for that purpose. But that these difficulties will be overcome is to my mind a certainty. We have to speak to-night only of the methods so far used. These are—surface printing from half-tone—lithographic printing—and the photo-gelatine method. Whatever method be employed, the keystone is, first of all, the three-colour negatives. If the method of surface printing is to be used, half-tone plates are made from the three negatives and superimposed impressions printed from them in the primary colours. The objection to this method is, that there is no true gradation, each colour consisting of a series of uniform dots of colour varying only in size and separation. Working however, under this system, additional printings are often added to obviate this objection and to increase the colour effect. The advantage of surface printing is in the rapidity and certainty of production.

The method of lithographic printing is also advantageously used in three-colour printing. But the want of a reliable process of making a transfer, where the gradation is broken up into a fine grain, has not yet been filled—it probably will be in the near future. The results, I think, will then be better than in surface printing from half-tone plates.

The advantage of the photo-gelatine method of printing—and it is a very great advantage, so great that I believe it to be the best method yet used—the great advantage of this method is that it gives true photographic gradation. Hence, in the superimposition of the three colours, each one having every gradation of its colour, the completed picture has every gradation of every combination of the three colours, and that is every gradation of every colour.

The process of printing is slow, and the want of uniformity in the editions has been referred to. In reply, I would say that it is but a short time ago the possibility of producing such results at all, as we have in this room to-night, would have been doubted. But they have come, and they have come to stay. By persistent effort the difficulties ahead will be overcome, for they are surely no greater than those which have been already conquered. Even at the present time, editions of considerable number and reasonable uniformity are being produced from power presses in three colours by the photo-gelatine process, and I have no doubt that, presently, sufficient uniformity in printing will be secured. After all, what method of printing is uniform? Even in engravings do we not distinguish between artists' proofs, proofs before letters, prints, and so forth?

I can only express my belief—a belief born somewhat of experience—that the photo-gelatine method is that which gives the truest and best three-colour reproductions.

I should like now to show you some lantern slides which may serve to illustrate some of the points I have endeavoured to establish.

What is to be the outcome?

Wood-engraving has almost ceased to exist, steel-engraving is suffering, engraving on stone will suffer, but at the other end it is progress—and progress means, when one industry dies, two new ones are born. Art never dies. Art originates. Art invents. Art produces, not reproduces. Our future is to reproduce art faithfully, and any process which tends to that end is progress. I believe there is no future for the wood engraver, the steel engraver, the lithographic artist, so far as they only reproduce. As such, these industries will die out and their places will be taken by those photographic methods which faithfully reproduce without the intervention of another's hand. And I believe too that, where ten men have lived by the old industries, a hundred will live by the new ones.

Looking backward! How nearly true it is, there is nothing new under the sun. I shall place on the table for your inspection two or three books, one twenty-two years old, published in St. Petersburg by Scamoni, in 1872, containing photogravures. A volume of *Art Pictorial and Industrial* published in London in 1871, containing Woodburytype and Heliotype illustrations. A work on photography by Blanquard Everard, published in 1869, containing illustrations by almost all the processes in use to-day. I am not afraid to make the assertion that the work contained in these books compares more than favourably with the work done to-day. Going further back, we find photo-lithographic work which is not excelled to-day. Shall we go further back still? I have in my hand a work by L. L. Hill, published in this city in 1856—nearly forty years ago—of which I will read you the title-page.

A Treatise on Heliochromy, or the Production of Pictures by Means of Light, in Natural Colors. Embracing a Full, Plain, and Unreserved Description of the Process known as the Hillotype, including the Author's Newly discovered Collodio-Chrome, or Natural Colours on Collodionized Glass, Together with Various Processes for Natural Colors, on Paper, Velvet, Parchment, Silk, Muslin, Porcelain, Wood, &c., and Elaborate Essays on the Theory of Light and Colors, the Chemistry of Heliochromy, and the entire range of the Author's Nine Years' Experience in Sun Coloring. By L. L. Hill.

The book itself is a study. It does not give much valuable or useful information, but it reveals the gropings of the inventor after what we are to-day realising. Incidentally—and pathetically—it reveals the truth of the saying that the way of the inventor is hard. The author writes: "After earning and spending over ten thousand dollars, and at the end of five years of the severest toils, brain-racking investigations, and bitter trials, I find myself a few hundred dollars worse than a poor man. I am aware that the impression is abroad that I have amassed an immense fortune. One writer has taken the pains to figure up my gains, and he made out about forty thousand dollars. But the whole truth is given in the foregoing statements, with the exception of the fact that the very house I live in, and of which I hold a deed, has been under mortgage for three years past." Incidentally, also, his investigation of the use of chlorophyl in connexion with colour photography is to be noted. This is the substance which forms the colouring matter of leaves, to the use of which Mr. Ives attaches so much importance.

Shall we look still further backward?

"The glorious sun stays in his course and plays the alchemist," says Shakespeare. Here is a line that fits well to photography—"Secure the shadow ere the substance fail." Or how is this from *Richard III.*: "Shine out, fair sun, till I have brought a glass, that I may see my shadow as I pass?"

But we, disciples of the Light, may claim the oldest origin of all for our art, and date it from that ancient of time, when the Great Creator said: "Let there be light; and there was light. And the evening and the morning were the first day."

ERNEST EDWARDS.

DR. P. H. EMERSON ON THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[Journal of the Royal Photographic Society.]

THOUGH I submit that it is possible to overrate the value of Exhibitions in furthering photography, yet they are of use in publishing the best work, though that function is weakened by the publishing of much inferior work with the best. Nor does quantity draw a public. In 1893, when I had the honour to be one of the Judges and selectors, we rejected more photographs than ever before or since, and yet the gate money taken that year was the largest sum on record.

Exhibitions are overdone all over the country, and awards have become so cheap that it will soon be a distinction never to have taken a medal at all. Nevertheless, the one Exhibition that will always be held in highest esteem will be our own, and therefore I offer one or two criticisms, for we must keep moving as we have done hitherto.

Nothing could be fairer than the way Judges are now chosen—though

I for one should like to see one or two good artists amongst the number—but not old-fashioned and second-rate painters as we have had, but some good black-and-white men like D. Hardy, Strang, F. Short, Phil May, Wilson, J. Pennell, &c. I submit, too, that the plan of the Judges selecting the pictures is excellent and most desirable. But the changes I would suggest for the consideration of the Council are in the arrangement of the gallery.

As a Society we are bound to encourage the three great branches of photography—scientific, commercial, and pictorial—and we cannot, therefore, arrange (with such a mixture) our gallery artistically, nor can art judges satisfy commercialists.

My suggestion, then, is that the gallery be divided into three parts by curtains, a *small* section to be set aside for science, and the rest of the gallery to be equally divided between pictorial and commercial photography; we should then have three galleries in one.

The number of pictorial works of *real merit* are so few—a first-class painter counted *two* at last year's *Salon* and *five* at our gallery—that no work of real merit would be excluded.

Different Judges could be nominated and appointed for the different sections, as they now are for science and art, and exhibitors could state on their entry forms which section they wished to exhibit in—as they did last year for "art or *technical*," which, I think, is a confusing division—it should be, "pictorial," "commercial," and "scientific."

I think, if some such arrangement is made, all classes of exhibitors will be encouraged and satisfied, and the public would, for their shilling, get three distinct "shows" for their money. By separating the gallery by curtains each section could be decorated and arranged to the best advantage, and it should be felt that to be hung at all in any section was an honour, but to get a medal a real distinction.

I am for less photographs and less medals, and, as I have said before, if we may augur the future from the past, such an arrangement would pay us better—let alone giving satisfaction to *all* our members—which is more important than the shekels.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 4538.—"An Apparatus for Stereoscopic Photography with One Lens." F. L. Stainsby.—*Dated March*, 1895.

No. 4585.—"Improvements in Photographic Developing Dishes." W. L. Barrett.—*Dated March*, 1895.

No. 4638.—"An Improved Photographic Camera." J. Willans.—*Dated March*, 1895.

No. 4818.—"Improvements in Plates Used for Photographic Purposes." W. H. Cook and T. Cook.—*Dated March*, 1895.

No. 4821.—"A New or Improved Washing Rack for Flexible Photographic Films." F. A. Schierwater.—*Dated March*, 1895.

No. 4997.—"A Needle Plumb Indicator for Photographic Cameras and Similar Purposes." J. Warboys.—*Dated March*, 1895.

No. 5016.—"An Improved Change-box for Photographic Plates." A. Murray.—*Dated March*, 1895.

No. 5017.—"A New or Improved Telescopically Collapsible Walking-stick Camera Stand or Tripod." A. M. Morrison.—*Dated March*, 1895.

We are sorry to learn of the death, on February 26 last, of Mr. Maurice Zimmermann, of the firm of Messrs. A. & M. Zimmermann, Cross-lane, E.C.

From the Photo-Autocopyist Company, London Wall, we have received a singularly excellent specimen of their work, on rough paper, the subject being Kirkstall Abbey.

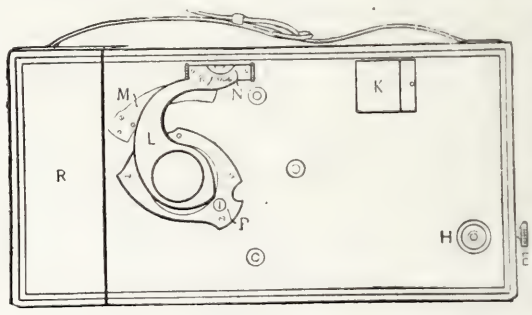
The South London Photographic Society will visit Salisbury on Easter Monday. Permission has been kindly granted by the Dean to members to photograph in the Cathedral.

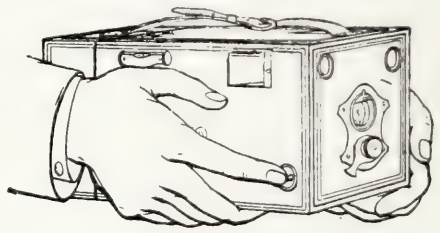
Camera Club Photographic Conference, 1895.—The 1895 Conference will be held at the Camera Club, Charing Cross-road, on Tuesday and Wednesday, April 2 and 3, under the presidency of Captain W. de W. Abney, C.B., R.E., D.C.L., F.R.S., P.R.A.S. On Tuesday, April 2, at 4 p.m., the President will open the Conference at the Club, and papers will be read from 4 to 6 p.m. At 8 p.m. the Conference will be continued, and papers will be read from 8 to 10 p.m. On Wednesday, April 3, at 4 p.m., the Conference will be renewed from 4 to 6 p.m. At 8 p.m. the Conference will be continued, and papers will be read from 8 to 10 p.m. On Thursday, April 4, at 7.30, the Annual Dinner for members and friends will be held. On Monday, April 8, a Lantern-slide Exhibition will be given at the Society of Arts (by kind permission of the Council), and for this special tickets will be required. The members' annual Exhibition of photographs will be commenced at the Club on the first day of the Conference. A complete programme will be issued later and distributed. Visitors are cordially invited to take part in the discussions. Tickets of admission may be obtained through any member of the Club, or on written application to the Secretary.

THE No. TWO FRENA.

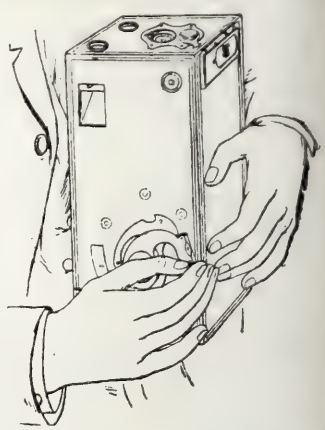
Since we last had occasion to write about the Frena hand camera of Messrs. R. & J. Beck, it has been subjected to such modifications as are born of experience, thoughtfully acquired and carefully applied. It is seldom that any idea or any invention jumps into full fruition all at once, and to this the Frena forms no exception. We think, however, that this neat little instrument may now be considered as permanently located amongst us. It was the No. 1 Frena which formed the subject of our last descriptive article; our present one has reference to the No. 2 of the same name, and which is characterised by a similar system of storing and changing the films, for, like its predecessor, it is intended for flat films, and contains within itself a supply to last for an outing, all stored "like a pack of cards."

The outline cut shows a side view of the No. 2 Frena, in which E is the knob for setting the shutter, H the discharging button, K one of the two finders, L the handle of a lever, in the upper end of which is N, a spirit level, M being a register spring; P is a small hole, showing an indicator of the number of films exposed, and R a receiver of films. In the front are situated the lens, the shutter, and the diaphragms, shown in the next cut, which also indicates the manner in which the camera is held, the forefinger being on the exposing button. The knob on the front, just below the lens aperture, is that by which the shutter is set, while a short lever on the same axis changes the diaphragms to whatever is desired.





As soon as the exposure is made, the Frena is held, *lens upwards* as shown in the next cut, and the lever shown in the first figure is rotated backwards as far as it will go, which effects the changing of the exposed film for a fresh one, the former being now stored away into the receiver. If a hitch occurs at all, it will arise from inattention to the very simple instructions given as to pointing the camera upwards while rotating the lever to change the film. Once this is realised, the rest is easy.



In connexion with this lever there is, as stated, a small spirit level attached to its upper end. This, when the lever is returned to its normal, indicates when the camera is levelled; but it has another use which is peculiar to this instrument alone, it provides for the means of directing it upwards or downwards. A tall edifice can be taken by tilting the Frena, while the verticality of the film is ensured by a slight rotating of the lever until the air bubble in the level is shown to be at the centre. This presupposes the employment of a stand, and, of course of a small stop, and circumstances often arise in which it must prove a real convenience to point a camera upwards without having buildings distorted by convergence.

The size of films for which the No. 2 Frena is adapted is the quarter-plate, and forty of these films are capable of being stored in it ready for use. One of the Beck Autograph rapid doublets of five-and-a-half inches focus is fitted into the Frena, and covers the plate with an aperture sufficiently large to permit of an instantaneous view being obtained of any object beyond twenty-five feet, although, by means which we have explained in the opening article, it is capable of taking objects as near as three and a half feet to the camera. The shutter—a circular one—travels always at a uniform rate of speed; but variation in

the duration of the exposure is provided for in the ability of lengthening or curtailing the opening in the metallic shutter, the narrower this slot the quicker being the exposure.

Like all hand cameras, the Frena must be held quite steady while the exposure is being made to ensure sharp results.

Our Editorial Table.

Herr Wilhelm Knapp, of Halle-a-S., sends us the following: Part I. of *Lehrbuch der Praktischen Photographie*, by Dr. Meithe; *Die Photographische Aufnahme von Unsichtbarem*, by Ottomar Volkmer; *Der Platindruck*, by A. F. Von Hubl, a study of the principles and practice of the various methods of platinotype printing and toning; and *Die Photo-lithographie*, by George Fritz, a very exhaustive treatise on the subject, with illustrations. The last two volumes are included in Herr Knapp's Encyclopædic Series.

From Messrs. Gauthier-Villars et Fils, Paris, we have received a copy of *Instructions Pratiques pour Produire des Epreuves Irrepróchables au Point de Vu Technique et Artistique*. By A. Mullin. This is a book of some 200 pages, written in a clear and simple language, and treating of what we might call pure photography only, that is, of exposure, development, and silver printing. Doubtless, by following the very lucid instructions given, the neophyte would soon boast of being able to produce technically and artistically good prints.

How to Use the Binocular Camera.

The London Stereoscopic and Photographic Company, Limited.

By the "Binocular" camera in the title of this pamphlet is meant the special one manufactured and sold by this well-known firm. In effect, it consists of two cameras united into one, both having similar lenses, but one of them being relegated to the function of a focusser and finder, with its appropriate ground glass, the sensitive plate or film being contained in the other. All this, together with a rapid-rectilinear lens, a shutter, and a dozen plates or thirty films, are put up in a form and space not very unlike to a field-glass, and which, when not in use, is carried in a sling case. In the taking of a picture the camera is held up to the eye, and, when the image on the finder side is seen to be sharp and in proper position, the exposure is made while the image is still visible on the ground glass.

The pamphlet gives full directions for using the "Binocular" and also describes the apparatus and means for making enlarged prints from the small negatives originally obtained. The brochure, containing forty pages, is well written in a practical style, and no one possessing a camera of the "Binocular" class can fail to take photographs by making it his guide. Price 1*s*.

Shadowit.

By C. Menton, Disraeli-road, Putney.

Shadowit is a retouching medium. It is a saponaceous paste to be applied to the negative by means of a piece of soft rag stretched over the finger. It appears to have a reducing action by abrasion, and when such toning down is required in small places an ordinary paper stump is used.

Catalogue of Thornton-Pickard Specialities.

In this Catalogue the first place is naturally given to the shutters so long and well associated with the name of the firm, and we have them here in every variety. Not only so, but there are several illustrative pictures given taken by their agency. Next follow rectilinear lenses, to be followed in turn by cameras respectively for the stand, the hand, and for stereoscopic work. A perusal of the catalogue will prove useful to those who aim at high speed.

Price-list of Camera Cases and Cameras.

R. T. Adams & Co., St. Ann's-road, Stamford Hill, N.

This Catalogue is a wholesale one and contains an extended list of camera cases, together with stands, dark slides, and cameras, all of which can be obtained through the trade. It contains several illustrative cuts.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
18.....	Camera Club	Annual General Meeting.
18.....	Glasgow and West of Scotland .	
18.....	Leeds Photo. Society	*Pictorial Work with the Hand Camera.* W. Thomas.
18.....	North Middlesex	*Elementary Hints on Composition.* E. R. Mattocks.
18.....	Richmond	Open Discussion.
18.....	South London	*The Art Craze.* Walter D. Welford.
19.....	Ashton-under-Lyne.....	Elementary Photographic Class.
19.....	Birmingham Photo. Society ...	
19.....	Bournemouth	Prize Slides.
19.....	Brixton and Clapham	
19.....	Derby	
19.....	Exeter	*F-14, or the Fatal Fascination.* C. Cole.
19.....	Gospel Oak	General Meeting.
19.....	Hackney.....	
19.....	Halifax Camera Club.....	*Art as Applied to Photography.* J. E. Fry.
19.....	Hastings and St. Leonards	
19.....	Keighley and District	
19.....	Munster	*Photographic Shutters.* Captain Cook.
19.....	North London	
19.....	Paisley	
20.....	Brechin	
20.....	Bury	
20.....	Croydon Camera Club	Photographic Chat.
20.....	Leytonstone	
20.....	Manchester Camera Club	
20.....	Midland	Demonstration on *The Use of the Eastman Company's Papers.* Mr. Baldwin.
20.....	Photographic Club	*Modern Lenses.* J. R. Gotz.
20.....	Southsea..	
21.....	Ashton-under-Lyne.....	Annual Meeting.
21.....	Birmingham Photo. Society ...	
21.....	Camera Club	*Evolution of an Illustrated Paper.* W. Hodgson.
21.....	Ealing	*Picture-making by Photography.* Charles Whiting.
21.....	Glossop Dale	
21.....	Greenock	
21.....	Hull	
21.....	Liverpool Amateur	Lantern in Use for Members.
21.....	London and Provincial	*Photography and Cycling.* E. H. Bayston.
21.....	Oldham	
21.....	Oxford Photo. Society	
21.....	Putney.....	*A Voyage to New Zealand.* G. E. Martin.
21.....	West London.....	Discussion: *Bromide and Carbon Printing.*
21.....	Woodford	*Canoeing in Denmark.* H. Wilmer.
22.....	Cardiff.....	
22.....	Croydon Microscopical	
22.....	Holborn	
22.....	Maidstone	
22.....	Southport	Prize Slides.—Mr. Neubert will exhibit and work the Lawson Saturator.
23.....	Hull.....	

ROYAL PHOTOGRAPHIC SOCIETY.

March 12.—Ordinary Meeting.—The President (Sir H. Trueman Wood, M.A.) in the chair.

Before proceeding to the business of the evening the President thanked the members for having elected him to the Presidency of the Society for the year.

Sixteen new members were elected, and the nomination papers of twelve candidates were read. The Hon. Secretary read the names of a large number of members who had been admitted to Fellowship since the last meeting, and stated that the five honorary members of the Society had been admitted as Honorary Fellows. Mr. W. Ackland had also been elected an Honorary Fellow.

The President stated that the Council had appointed a Committee to draw up a number of suggested qualifications for members desirous of being admitted as Fellows, and a form to be filled up by applicants had also been drafted. The President further said that it had been decided to abandon the technical meetings of July and August, on account of the smallness of the attendances, and also stated that the Council had arranged for a series of special meetings devoted to photo-mechanical process subjects. Referring to the question of more suitable premises for the Society, he said that a Committee had the matter in hand, and suitable accommodation was likely to be obtained at an early date.

Mr. T. R. Dallmeyer read a paper on *Inequality of Illumination in Photographic Lenses*, and described the mechanical remedy for the defect, devised by M. de la Crouée. After pointing out the extent to which the illumination fell off as the edges of the plate were approached, particularly where a diaphragm was not used, Mr. Dallmeyer briefly referred to methods which had been suggested for equalising illumination, including a movable diaphragm for cutting off the middle of the picture, producing a kind of reversed vignette in the centre of the lens by deepening the colour there, &c. After touching upon shutters and their properties, he said that those with the iris opening fulfilled the ideal conditions. The method employed by M. de la Crouée consists of a kind of shutter having as aperture the sector of a circle, which is revolved by mechanical means in front of the lens. This allows of the light being cut off in the centre of the plate, and also admits of the exposure being varied on different parts of the plate, so that selective exposures on the one plate may be given.

Mr. Dallmeyer showed lantern slides illustrating the equalisation of the

illumination by this method, and also pointed out that where a very small aperture was employed, the light was cut off too much in the centre. This suggested the possibility of using the device for photographing against the sun. Positives, in which the exposure for the shadows was much increased, were also shown.

In the discussion that followed, Mr. T. Bolas referred to the suggested use of an opaque star stop for the same purpose as that mentioned by Mr. Dallmeyer.

Mr. W. E. Debenham also described an arrangement he had devised for the purpose. This consisted of a disc supported on wire uprights, and rocking to and fro inside the camera.

In reply to various remarks, Mr. Dallmeyer described M. de la Crouée's device as a handy kind of shutter, which would probably be useful for time-exposure work.

After other discussion, a vote of thanks was passed to Mr. Dallmeyer.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

March 7,—Mr. H. C. Rapson in the chair.

By the kindness of Messrs. Elliott & Son, of Barnet, about forty packets of Barnet matt bromide paper were distributed among the members for trial.

Mr. A. Haddon referred to an article on *Ceramic Enamels*, in *Photography Annual*, 1894, and invited comparison of it with an article on the same subject by Mr. N. K. Cherrill, in the *Year Book* for 1886. That article had been reproduced in Abney's *Instructions* and Woodbury's *Encyclopædia*, and acknowledged by those gentlemen. The article in *Photography Annual* was (said Mr. Haddon) practically a reproduction of what was published by Cherrill in 1886, but no word of acknowledgment was given of the source of information. He submitted that any one would infer that the gentleman who wrote the article in *Photography Annual* was the author of the process, instead of which it was in every respect a facsimile of what was published in 1886 by Cherrill. The gentleman in question would probably give some explanation.

Mr. E. D. Bartlett having inquired whether it was agreed by the members that there was a resemblance between Cherrill's article and that in *Photography Annual*,

Mr. G. W. Atkins (the Hon. Recorder) read Cherrill's article, Mr. Thomas Bedding comparing it with the alleged reproduction.

Mr. Bedding said it appeared to him that the points of resemblance in the two articles outnumbered the points of difference. The essential passages and formulæ in the two cases were virtually identical, and his opinion was that it was a most extraordinary coincidence.

The matter thereupon dropped.

Messrs. Marion & Co.'s representative attended, and passed round for examination two of Voigtlander's new collinear lenses. He also showed negatives taken with one of the lenses, and others with a lens of the rapid rectilinear type.

A brief conversation concerning the new lens took place, Mr. W. E. Debenham referring to the advantages which a lens having a flat field possessed.

Votes of thanks were passed to Messrs. Marion & Co., as also to Messrs. Elliott & Son.

PHOTOGRAPHIC CLUB.

March 6,—Mr. Broad in the chair.

Messrs. Elliott & Son sent down a number of packets of "Barnet" platino-bromide paper for distribution.

Mr. Birt Acres remarked that the prints should not be exposed to white light until they had been well rinsed with water, otherwise a brown stain would ensue.

Mr. E. J. Wall was unanimously elected a member.

Mr. F. Haes read a paper on *The Collinear Lens:* "By the kindness of Messrs. Marion & Co., I have the pleasure this evening of showing you the collinear lens of Messrs. Voightländer & Sons, so called because they claim for it that it has not, as they say, the bad quality of astigmatism, which they define as the splitting into two lines every point of the object near the margin of the picture, but it gives instead an image coming very near to an absolutely geometrically correct or collinear one. They say that the principle of construction is quite new, not being based upon the application of normal and abnormal glass couples, but that the refraction takes place between two positive lenses. The glass used is from the Jena manufactory, but I have not seen any account of the densities employed. The lenses consist of two trebly cemented halves, which, according to the makers, have only their symmetrical quality in common with the Goerz double anastigmat. This is a No. 6 collinear:—

Equivalent focus, 300 mm. = $11\frac{13}{16}$ inches.
Diameter of lens, 50 mm. = $1\frac{31}{32}$ inches.
Covering power, *f*-6·3, 16×21 centimetres = $6\frac{5}{16}\times 8\frac{1}{4}$.
,, *f*-12·5, 18×24 centimentres = $7\frac{1}{8}\times 9\frac{7}{16}$.
,, *f*-18 to *f*-36, 24×30 centimetres = $9\frac{7}{16}\times 11\frac{13}{16}$.

This lens at full aperture covers the whole plate well, and gives a round and good image as a portrait lens, for which only I tried it on a standing figure. The vertical lines of a door were well given. At *f*-18 it covers a 12×10 fairly well to the edges, though there is a slight falling off. The illumination appeared equal over the plate; but, as far as the weak daylight early in January, when I tried it, allowed, it did not seem to give a perfectly sharp image on the screen at the extreme edges at *f*-71. I should not like to say that it is not sharp enough; but, although the day was bright, the feebleness of the light made correct observation uncertain with so small a stop. The image of a two-inch watch-dial, focussed in air, with full aperture, was everywhere good, the seconds divisions being quite distinct, and these and the larger figures were perfectly black, not grey. All examinations of image were made with a Zeiss eyepiece. As a universal lens I should think it would be very useful. The exposure with an ordinary Ilford plate for full-length figures on $8\frac{1}{2}\times 6\frac{1}{2}$ plate, quite in the shade, at north end of conservatory, lighted from the south, was three-quarters of a second, which was correct. The 12×10 plates, with *f*-18, wet collodion, were exposed for 100 seconds. The definition on the screen for 12×10 was excellent for extreme distance. The lens was focussed for this only, the same as when using a Zeiss objective, and no attempt was made to focus on the middle distance. The farthest chimneys are 600 feet away. In the street view a particular pattern in a window curtain was focussed on. As this lens is not catalogued to cover 12×10 at *f*-18 to the edges, due allowance must be made for the trial plates being that size. The lens being symetrical, either half can be used for groups or landscapes, and would, doubtless, cover a larger plate. I regret having been unable to try this form."

Mr. Foxlee drew attention to the fact that the aperture of the diaphragm of the smaller lens shown was the same as the diameter of the lens itself, whilst the larger one had a diaphragm about three-eighths of an inch smaller than the lens itself. He very strongly remarked upon the fact that English opticians were at a disadvantage when a comparison of the apertures of foreign and English lenses was made.

Mr. Fry said that it would not be difficult to find people who recommended a foreign lens in preference to an English, *on account of the larger aperture obtainable*.

Mr. Foxlee said that was just his point; the sizes given were fictitious when compared with English sizes.

Mr. Bridge referred to the remarkably brilliant image on the screen with a Zeiss lens, which was not perceptible on the negative.

Mr. Foxlee said that this was due to the high polish given to the lenses. He had never seen such highly polished lenses as the Zeiss. For copying purposes such lenses were advantageous, but there, he thought, we had to rest. An ordinary rectilinear would give a better result in ordinary work.

Mr. Staley agreed with the foregoing remarks, which he had confirmed by actual experience.

Mr. Gower, representing Messrs. Marion & Co., showed their registered trimming shape. This was graduated for various sizes.

A vote of thanks was passed to Messrs. Marion, Haes, and Elliott & Son.

Mr. Birt Acres showed some interesting slides, specimens of work on the frozen river.

Croydon Camera Club.—The Fifth Annual Dinner was held last week, the President (Mr. Hector Maclean) being in the chair.—The toast of the evening, "Prosperity to the Club," was proposed by Mr. Horatio Nelson King, who, in the course of a delightful speech, treated his audience to many interesting reminiscences. Thus, in "the sixties," one particular day, when *cartes-de-visite* were the rage, Mr. King's appointment list showed the names of no less than *three* bishops, Madame Celeste, Tom Sayers, and Heenan! One of the bishops was Wilberforce—"Soapy Sam"—who inquired whether the portraits of bishop or boxer sold best. "Fifty to one on the pugilist," answered Mr. King. On another occasion Livingstone was "operated upon;" after two long hours the eminent explorer escaped, and, rushing out from the photographer's clutches, meets Mr. Glaisher, now one of the Vice-Presidents of the Croydon Camera Club. "Has he taken you?" the latter inquired. "Taken me! Yes, in every conceivable position, except standing on my head," answered Livingstone. "You are in error," replied Mr. Glaisher, "for probably the only position in which he did take you *was topsy-turvy*." In the course of his acknowledgment on behalf of the Club of Mr. King's good wishes and kind promises, the President, having glanced at the past work and future prospects, both of which were painted in bright colours, dwelt upon the value of photography and the Club in raising the status of individual members.

Gospel Oak Photographic Society.—March 5.—Mr. W. E. Debenham gave a lecture on *Portrait Photography: Lighting and Posing*, which proved of very great interest to the members. Mr. Debenham supplemented his remarks by a liberal use of the blackboard, by which he was enabled to point out the different effects of lighting the subject. At the close of the lecture Mr. Debenham answered several questions that were put to him.

Hackney Photographic Society.—March 5.—Mr. E. J. Wall presiding.—Mr. R. Beckett read a paper on the *Comparative Rapidity of Various Plates*, in the course of which he compared the old system of Warnerke with the more scientific method of Messrs. Hurter & Driffield. He explained the use of the grease-spot photometer, and also Messrs. Cadett & Neall's system of speed determination, by which the density ratios were registered by dots connected by lines upon a chart. It was found that, on the much under and much over-exposed parts, the lines joining the dots were curves; but, on the whole of the central portion, the lines were straight, and, when produced to the base line, the speed was read off on the logarithmic base line. Mr. Cadett then occupied the attention of the meeting with slides shown through the lantern, whilst he explained the whole process. He said that, if the formula of the developer were constant, continued development gave, of course, greater density, but the lines connecting the new series of dots would in all cases meet the base line at the same place. If the formula were changed, the speed number was altered, and, as different makers of plates recommended different formulæ, care must be taken not to confuse the speed number of one make of plates with that of another. Plates were now to be marked with two speed numbers, one to be used for Hurter & Driffield's standard ferrous-oxalate developer, and the other for the formula issued by the makers of the plates, and which they recommend as the most suitable for that particular brand of plates. In the subsequent discussion the following further information was elicited: That the speed numbers on the boxes were a decided aid to workers when using an exposure meter; that there was no ready means of testing orthochromatic plates; experiments in connexion with these would yet have to be made through the spectrum; that time affected to some extent the keeping qualities of plates, the most rapid being the worst in this respect; there was a slowing of speed, a possible trace-

of fog, and loss of density, this last particularly with lantern plates; that the first formula of the Velox developer discoloured the negative, but the improved formula did not.

Putney Photographic Society.—March 4, Mr. L. S. Zachariasen in the chair.—Several slides by Messrs. W. F. Gorin and L. S. Zachariasen were passed through the lantern, after which the Hon. Secretary (Mr. W. Martin, jun.) gave a short demonstration on the making of lantern slides, those plates developed being afterwards thrown on the screen.

South London Photographic Society.—March 4, Mr. C. F. Dickinson in the chair.—A members' competition for the best set of six lantern slides from negatives taken at the Society's excursions in 1894 was held. The Judges, Messrs. Bull, Dickinson, and Maull, declared Mr. J. A. Sinclair to be the winner.

On Thursday, the 7th inst., the first *Conversazione* and Cinderella Dance was held at the Public Baths, Church-street, Camberwell, and was well attended by the members and their friends, and a most enjoyable evening was spent. There were sixteen dances in all, the music being supplied by Hellstern's Quadrille Band, and the limelight effects by Messrs. French & Mountjoy. The following vocalists contributed towards the success of the evening: Mr. C. S. Smith, Miss L. O'Callaghan, Miss Lily Taylor, and Mr. E. S. Whitby. Mr. J. W. Bouffler gave a couple of banjo solos and Mr. A. Cooper Cameron recited.

Woodford Photographic Society.—March 4.—The members of this Society gave their second Lantern Exhibition. The entertainment consisted of specially selected lantern slides by the members of the Society and music. An excellent arrangement for use in cold weather had been devised and made by the President. It consisted of a kind of water jacket standing in a tray to catch condensed moisture, and heated by a small Bunsen burner within, the top being corrugated to allow of a current of air passing beneath the slide boxes, which were placed on top, the bottoms of the boxes having first been slid out, all but a beading sufficient to hold the slides, and the tops raised a small distance. The hot air rising from the heated water jacket quickly warmed the slides to about 90°, although the temperature outdoors was a painfully long way below freezing point. The slides were therefore perfectly free from condensation when shown from the lantern, which, by the way, was worked with a gridiron saturator, and gave an admirably clear even illumination. The President (Mr. E. B. Caird), in opening the proceedings, briefly referred to the formation of the Society sixteen months ago, and spoke of the enthusiasm which was being shown by members in carrying out the object of the Society, as stated in the rules, "The advancement of photography technically and artistically." After alluding to the Exhibition held in connexion with the Society in November last, and to the excellent work then shown by the members, the President gave some interesting particulars respecting the so-called magic lantern, stating that its invention dated as far back as 1261. The display started with a slide of the George Inn, High-road, Woodford, a capital presentment of the old hostelry, including the modern policeman on point duty at the opposite corner of George-lane. We were then transported with magic speed to places far apart, as Devonshire, Wells Cathedral, the Scottish Highlands, many parts of Epping Forest, &c. Curious old churches in out-of-the-way places, where the old Norman carvings still remain in wondrous preservation, were also shown. Many of the architectural slides were particularly fine. We specially noticed two of parts of the carved doorway of Lincoln Cathedral, and one of Canterbury Cathedral. Then, by way of variety, we were shown several scenes on the river Thames during winters on record, the river being shown as a veritable sheet of snow-covered ice. The forest scenes were unusally interesting in their selection, and we think the Woodford Photographic Society is to be congratulated on the devotion shown by its members in securing such delightful records of the changing seasons, each of which gives new beauties to the grand old Forest. Some showed the calm delights of warm, leafy summer-time; others the denser growths of early autumn; while the fleeting beauty of the hoar frost was charmingly displayed by several. Then, to please those of a lighter vein, several excellent snap-shots of children and holiday-makers by the sea were shown. The very good plan was adopted of breaking the entertaiment twice in the course of the evening for music, several songs being charmingly rendered by a musical party, arranged by the President; "Douglas Gordon," by Miss Sangain, and a "Hunting Song," by Mr. Franklin Clive, displaying great taste and ability. We were sorry to hear that several prominent members of the Society were prevented from being present by the prevailing epidemic of influenza. The names of the members whose slides were exhibited were not mentioned, so we cannot congratulate them individually, as we most sincerely do the Society as a whole on the excellence of all parts of the display; slides, screen, lantern, and music, all were of the best.

Bath Photographic Society.—February 27, Annual Meeting, Mr. A. F. Perren (President) in the chair.—The report set forth that the anticipations expressed in its predecessor had been partly realised. If important improvements showed a dearth, solid work inside and outside the immediate precincts of the Society had been achieved. Other societies had benefited by help from the Bath Society, which was the stronger and better therefor. The appeal for an increased subscription and a larger roll of members had been cordially responded to, thereby placing the income in an easy position. Lectures and demonstrations had, as usual, taken place in the winter months, and excursions in the summer. In July the members visited the Rev. C. W. Shickle at Langridge, and afterwards took tea at the Rectory. Towards the end of the same month the Very Rev. Monsignor Williams again entertained the Society at Prior Park. Several interesting excursions took place; a few, however, had to be relinquished on account of the weather. Two dinners were held; the first was arranged soon after the fifth annual meeting, and the second took place at the end of January. These were pronounced successes. A *conversazione* also took place in January, when the Society filled the programme of the Literary and Philosophical Association. The survey photographs had been increased in number of subjects. It recommended an officer should be appointed as Librarian, and one to fulfil the duties of Curator. Financially the Society is better off by some 10*l.* than when the previous report was submitted. Thanks are due to the Auditors, Messrs. Appleby and Howe; also to the photographic press and the proprietors of *Bladud* for publicity given to the proceedings, and to those journals which furnish copies of their papers. The Chairman moved the adoption of the report and balance-sheet as read. He considered it satisfactory, especially the increased membership, and he thought it probable there would be a further improvement in the coming season. Mr. F. J. Moody seconded the adoption of the report, &c., which was carried *nem. con.* Mr. Perren then vacated the chair, which was temporarily taken by Mr. Austin J. King. Mr. G. F. Powell said Mr. Perren had so ably filled the position of President during the past year that he proposed his re-election. Mr. Austin J. King spoke of Mr. Perren as a typical President, and his re-election was unanimous. Mr. Perren, resuming the chair, thanked the Society for the honour they had conferred on him, and said he would earnestly endeavour to earn to some extent the eulogiums passed upon him. He then moved the re-election of Messrs. Powell and Lambert as Vice-Presidents. Mr. W. Pumphry seconded.—Carried unanimously. Miss R. M. Sotheby proposed, and Mr. J. F. Howe seconded, the re-election of the Committee, with thanks for past services.—Carried unanimously. Mr. E. J. Appleby proposed, and Mr. E. Lambert seconded, the re-election of Mr. W. Middleton Ashman as Hon. Secretary and Treasurer.—Carried. Mr. Appleby proposed, and Mr. Williams seconded, the appointment of Mr. Lambert as Librarian.—Carried. Mr. King proposed, and Mr. Ashman seconded, the appointment of Mr. Perren as Curator.—Carried. The Chairman drew attention to a novel form of plate-rack and other useful articles sent from Birmingham; some view-finders of an improved pattern from Marion & Co.; and the Eastman Company sent for exhibition one of their new Kodet hand cameras. The Hon. Secretary (Mr. Middleton Ashman) gave a practical demonstration upon printing by development, with especial reference to the various developers advocated by manufacturers. The advantages appeared to be in favour of a one-solution metol.

Rotherham Photographic Society.—March 5, Dr. Baldwin (President) in the chair.—One new member was elected. Mr. T. A. Scotton, Hon. Secretary of the Derby Photographic Society, demonstrated the working of the *Carbon Process* most successfully. The various operations of this very beautiful printing process were lucidly explained, and the resulting pictures from Mr. Scotton's own negatives were much admired. The tissue had been kindly supplied by the Autotype Company. At the close a hearty vote of thanks was accorded.

Sheffield Photographic Society.—March 5.—Mr. J. W. Charlesworth gave a practical demonstration, *How to Manipulate the Society's New Optica Lantern.* He proceeded to explain that, in using this lantern and a cylinder, with ordinary care there need be no fear whatever of an explosion, unless the gases were allowed to come in contact. He then showed how to couple up the cylinder, adjust the lime, and ascertain when the most brilliant light was obtained.

Glasgow Photographic Association.—February 21.—A popular meeting of members and friends was held in the Philosophical Society's Rooms, 207 Bath-street, Mr. John Stuart (President) in the chair.—Mr. J. Craig Annan gave an interesting account of his visit last spring to northern Italy, and showed a large and excellent series of slides from negatives taken in, or near, the three picturesque towns, Genoa, Venice, and Florence. The lecturer, in a racy and humorous manner, described the personal incidents of his tour. Many of the subjects thrown on the screen were the same as were exhibited by Mr. Annan at the recent Salon Exhibition in London. Altogether, the lecture was an excellent one, and was much appreciated by a large audience which turned out to hear Mr. Annan, notwithstanding the extremely low temperature of the night. At the close, on the motion of Mr. Lang, a very hearty vote of thanks was awarded Mr. Annan.

FORTHCOMING EXHIBITIONS.

1895.			
March 18–20	.....	West Surrey Photographic Society. Lavender Hill, S.W.	Public Library,
25–30	.....	*Brixton and Clapham Camera Club. 11, Corrance-road, Brixton, S.W.	F. W. Levett,

* Signifies that there are Open Classes.

News and Notes.

The Leeds Photographic Society held their Annual Lantern-slide Exhibition in the Albert Hall, on March 7th, in the presence of a large number of spectators, who passed a most enjoyable evening. The lantern used was that of the Corporation of the City of Leeds, which they make use of in the Council Chamber in broad daylight to throw plans of schemes on the screen, and the electric lamp was that invented by Mr. F. J. Borland, who himself, with Mr. A. E. Nicholls, superintended the arrangements. A large number of selected slides, embracing all manner of subjects and treatment, were thrown upon the screen. Mr. J. H. Walker, the President of the Society, who acted as cicerone, in his introductory remarks congratulated the Society on an increased membership roll, an increased balance at the bank, an increased enthusiasm among the members, and consequently an improvement in the quality of the work produced.

An Unfortunate Photographic Speculation.—A case of considerable interest to photographers was heard at the Blackburn County Court on March 5. James N. McNeil, photographer, Blackburn, sought to recover 50*l.* from James Herriott, photographer, 8, Castlegate, Berwick-on-Tweed. The action arose out of the disposal of plaintiff's business as a photographer to the

defendant. Defendant made a counter claim for 100*l.* for misrepresentation. Mr. McNab, barrister, represented plaintiff, and Mr. Withers appeared for Herriott. Plaintiff stated that he formerly carried on business at Preston New-road. Defendant, who said he was in business in Bury, called at his place and said he wished to have a larger business. Witness was desirous of disposing of his business. Defendant was shown over the premises, and witness gave as the reason for wishing to leave the business that he was in indifferent health. He told Herriott that the business was "down," as he had, through the illness of his mother, not been able to devote his whole time to it. He did not say it was an increasing business, and that it was of the yearly value of 400*l.* Witness fixed the ingoing at 250*l.*, but no price was agreed upon at the interview. Witness wrote to the defendant on April 24 to the effect that he could not give the takings for 1893, but in 1892 the books showed the receipts to be 379*l.* Correspondence afterwards followed, and on July 16 defendant entered into possession of the premises, and on the following day paid 30*l.* as a deposit on the 150*l.* purchase money. Witness also claimed 4*l.* 14*s.* for boarding Mr. and Mrs. Herriott and their son, and 11*l.* 4*s.* for goods detained. In September defendant wrote to the effect that the business was not worth 100*l.* He intended to keep in his possession the articles claimed until he was satisfied as to the business, or he would hand over the business to Mr. McNeil for the deposit of 30*l.* and expenses. Cross-examined by Mr. Withers, witness said that, when he took the business in August, 1879, it was worth 470*l.* a year. He did not tell the defendant that the takings, owing to his inattention, had dropped from 700*l.* to 400*l.* In November, 1892, he discharged an assistant named Reeves because the business was slack. Defendant had been established at Preston-road a few weeks when he threatened to shoot witness. Defendant, who was of an excitable temperament, did not say that he had been "done." In 1893 his takings would average 5*l.* or 6*l.* a week. Mr. Withers thought his Honour would come to the conclusion that the defendant had been "done." When defendant saw plaintiff he was told that the takings were formerly 700*l.*, but were now 400*l.* Defendant relied entirely upon the statement of McNeil. For the few months that the defendant had the business, he only made about 10*l.* Mrs. Herriott said that, at the suggestion of Mrs. McNeil, his wife came to stay at Blackburn. For three weeks there was possitively no business. Mrs. McNeil said, "Try to bear up; the business will be all right." He remained in the premises fourteen weeks, and his receipts were 10*l.* He considered he had been "had" in the business. Something had been said about him going to shoot McNeil. Mr. Withers: Never was going, mind that. Witness: I was going to go for him. (Laughter.) James Reeves, assistant to Mr. Jennings, photographer, Blackburn, said he was in plaintiff's employ from April to November, 1892. He estimated Mr. McNeill's takings at 35*s.* per week. His Honour said there was practically no answer to the plaintiff's claim, as it was obvious that Herriott entered into the contract to purchase the premises. With regard to the false and fraudulent representations, he must say that, of all cases he had heard, that was the strangest. There was no evidence to support the question of fraudulent representation. The evidence was the other way. On his counter claim defendant had no case. There would be a verdict of 45*l.* 6*s.* for plaintiff on his claim, and a verdict for him also on the counter claim.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

THE SPEED OF PLATES.

To the EDITOR.

SIR,—Letters of the style of the one by "Senex" teach nothing to any one. If argument is to be settled because an individual considers himself an "old hand," the sooner we say good-bye to progress and learning, the better. I trust "Senex" does not consider himself too old to learn, and may I humbly suggest that he will ask himself the relation of density to speed, and, when he has found the answer, to try and determine a way to give the actual value of this relation in camera testing. In certain cases it is difficult to be truthful and courteous at the same time—I endeavour to be both—yet I am bound to say that, when "Senex" declares it has been "conclusively proved" that the Hurter & Driffield scale of densities has in practice nothing reliable in it, his statement is *absolutely without foundation*, but he makes it, and all scientific authorities will agree with me that argument with him is not possible.—I am, yours, &c., JAMES CADETT.

Ashtead, Surrey, March 9, 1895.

To the EDITOR.

SIR,—The influence of fog upon the speed of plates is a very important one; but, so far, Mr. Watkins does not seem to have obtained sufficient evidence to warrant any departure from Messrs. Hurter & Driffield's method of total deduction.

The consideration of the subject falls under two heads.

1st. Fog due to light other than that used to form the picture and which may have been received by the plate during manufacture, or in the hands of the user before or during exposure, or before or during development.

2nd. Chemical fog.

The first must be subdivided thus, because the effect is different.

(*a*) Before development.

(*b*) During development.

As I have nothing new to add to what has been given respecting the first head (*Auxiliary Exposure*, BRITISH JOURNAL OF PHOTOGRAPHY, 1883, p. 686), I will pass on to the second, which Mr. Watkins thinks of so much importance.

Chemical Fog.—The new theory seems to be, that the density ratios throughout the correct period are constant, provided that chemical fog is prevented, and that, when chemical fog occurs, it alters the speed reading by adding more density to the shadows than the high lights.

A very simple test as to the correctness of the theory is easily made, for it is manifest that, if the whole of the increase in fog is added to the smallest density which comes upon the straight line, and none to the highest, we have a fresh line which, when produced to the base line, will indicate the greatest possible increase which the theory will permit, supposing that the whole fog is chemical, and not in any way due to light.

A plate was chosen, which was known to be specially sensitive to variations in the proportions of the developer, and exposures from one to thirty-two centimetres were given. The plate was then cut in half and one portion developed with a pyro-ammonia developer, and the second with half the quantity of ammonia, but for a longer time, so as to obtain approximately equal development. The densities found were as under:—

CMS.	Density.		Mr. Watkins's Theory. Fog Difference, ·10 added.
	Pyro Amm.	Half Amm.	
1	·25	·03	—
2	·60	·16	—
4	1·02	·49	·59
8	1·42	·97	1·02
16	1·69	1·44	1·44
32	1·94	1·82	—
Fog ...	·19	·09	—
Inertia ...	·72	1·9	1·5
Speed ...	·47	18	23

It is thus seen that the greatest possible addition to the speed which could be obtained by the addition of the whole increase of fog would be 5, whereas, in fact, there is found to be 29, and three times the amount of fog found would be required to confirm the theory.

The experiment given above will be seen to confirm Mr. Cadett's point that *some* makes of plates require a careful adjustment of the constituents of the developer to obtain the highest results.

For about a year from the time of adopting the Hurter & Driffield method of speed testing (midsummer, 1891), my experiments coincided in the main with what they had found—that is, that little material change of speed was noticeable by varying the proportions of developers containing a restrainer, but by that time I had fully recognised that *no bromide*, also eikonogen and para-amidophenol, did vary the speed reading materially.

In July, 1892, however, a plate came to my notice exceedingly variable in speed, not only with different reducing agents, but also with different proportions of the constituents, as will be seen from the following extracts from my note-book:—

Number.	Date.	Developer.	Speed.
188	27 July, 1892.	Double ammonia.	28
189	do.	Normal do.	14
190	do.	Half do.	8½
208	1 August, 1892.	Quarter do. no brom.	40
209	do.	3% rodinal, no brom.	70

No other plate since found has ever shown such marked variations as the above, but from that time I have assumed that varied conditions might be expected to give more or less varied readings, and have rigidly kept to uniform conditions in my own work when comparisons were required.

Since 1891 the highest speed of plates has risen from about sixty to one hundred and sixty or more, with ferrous-oxalate developer, whilst the fog has been greatly decreased, and it is not therefore surprising that much stronger developers may now be used, and acceleration obtained which was formerly impossible on account of fog.

Now that Messrs. Hurter & Driffield have decided upon standard conditions to which all variations may be referred, the peculiar characteristics

of different makes of plates can be readily indicated, and the makers also show what they find to be the conditions suited to obtain the best possible results from every improvement in the manufacture.

I am glad to see marking the same plates with different numbers according to the developer used now recognised as a necessity, having myself adopted it for over three years, and have repeatedly ascertained the variations for friends also.

From a letter in to-day's BRITISH JOURNAL OF PHOTOGRAPHY, I see there are still some who delight in stating that the Hurter & Driffield system has "in actual practice nothtng reliable in it;" but I have failed to find any one who would allow his results in proof of such assertion to pass through my photometer.—I am, yours, &c., J. STERRY.

Redhill, March 8, 1895.

RE HALF-TONE NEGATIVES.

To the EDITOR.

SIR,—In your brief report of my remarks at the recent meeting of the London and Provincial I am made to say that I "quoted Mr. Max Levy as saying that the greatest vigour was obtained with the square-shaped stop." What I did say was to point out that of the specimens I showed the proof obtained from a negative made with a square stop showed the greatest vigour, and that this seemed to accord with Mr. Levy's recommendation of a square stop. I wish now to emphasise that I should not care to commit myself to the unqualified statement that a square stop would in all cases give the greatest vigour. Nor would it be right to credit Mr. Levy with such an assertion; otherwise there would be no object in that gentleman patenting an apparatus for forming a diaphragm of square aperture with rectangular extensions at the corners.

Whilst writing, I may take occasion to say that I do not quite see the spider analogy of Mr. Whiston's theory; but, undoubtedly, the production of larger and smaller dots in a half-tone negative (and the vignetting of the dot of which Mr. Bolton writes) is an effect of vibration in accordance with the undulatory theory of light and the phenomena of diffraction gratings. Thus it may be expressed: That the luminiferous ether in the transparent intervals of the grating becomes simultaneously disturbed and kept in vibration by the light from the diaphragm aperture, and in proportion to the intensity of such light. Therefore, light of varying intensity reflected from different parts of a picture produces discriminating dots on the sensitive plate.—I am, yours, &c.,

WILLIAM GAMBLE.

PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—For the last year I have been literally flooded with circulars, &c., of the Photographers' Copyright Union, and lately I received a friendly and direct hint from one of the hard-working members of the Committee to join the Photographers' Copyright Union, which, I am informed, is now on a broader basis. I must confess I look on this broadness with suspicion, as I cannot help thinking it approaches rather closely the protection of a patent form of a free-portrait idea. Must I give an explanation of this idea? I think it will be better.

In how many towns do you find the so-called high-class business exclusively patronised by clergymen, doctors, lawyers, &c.? Oh, not for money! oh, dear, no! but for the copyright and thanks returned, accompanied by one or two dozen cabinet photographs.

Gentry and literary men are treated in the same way, and, in fact, if you gain a guinea prize in *Tit-Bits*, and your name appears in print, you are at once illustrious enough to be asked for a free sitting.

With actors it is about the same; the leading artists get the supply for nothing, the others have to pay half price. All over the same, the one who can afford to pay is photographed free of charge for the sake of their patronage and recommendation by people who know no better, and for the sake of the copyright you may perhaps get paid 10*s.* 6*d.*, and have your name inserted in a free advertisement.

I know I can't swim against the stream, so intend to keep away from it, not feeling inclined to help pay to keep afloat concerns who work against the general welfare of the photographic body.

On the other hand, let me assure you I am in favour of copyright, but do not feel inclined to do all the business on spec—that if the celebrity dies, I, or more likely the bromide-decorating academy, have a chance.

According to my idea, business should be so arranged that the one who can afford it should pay, and if I should wish to copyright any photographs I shall do it to prevent copying for illustrated papers, and so protect my patrons.

In writing this I hope to give no offence, and, at the same time, ask you to excuse that AUDACIOUS OPERATOR.

DECADENTS AND THE SALON.

To the EDITOR.

SIR,—It is quite refreshing to turn from such anonymous writers as the "Greek" and 'Cosmos" to the straightforward letter by H. P. Robinson *re* the why and wherefore of "Salon," with its "inmost workings." As a provincial photographer, far away from the "heated personality," let me beg that, for the sake of photography generally, this bitter hitting out, under assumed names, shall cease at once.

May I, through your columns, appeal, as a young professional, to Mr. H. P. Robinson and all members of the "Linked Ring" to take a "vow of abstinence" from replying to *any* anonymous remarks or letters. By so doing, they would confer a great boon upon all *fair-minded* Englishmen, who still love to see fair play—for it still takes *two* to quarrel.—I am, yours, &c., P. E. COE.

Victoria Rooms, Corridor, Bath, March 11, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange Watkins's exposure meter for a time shutter (two-inch aperture) or burnisher.—Address, C. DROBIG, 151, Stamford-street, London, S.E.

Will exchange quarter-plate or 5×4 in case (Swinden & Earp's hand cameras) for 12×10 lens by good maker.—Address, W. V. MORRIS, 34, Parade, Cork.

Wanted, LANTERN RECORD (SUPPLEMENT) for May, 1894, in exchange for *Photographic Society Reporter, Amateur Photographer* (selection).—Address, G. E. BROWN, 167 Park-lane, Swindon, Wilts.

Will exchange a beautiful case of stuffed sea birds, caught on Lincolnshire coast (valued at 9*l.*), for studio-camera, and lens, stand, or accessories.—Address, A. MORLING, 31, Rutland-grove, Chorley Old-road, Bolton, Lancashire.

Will exchange Britannia Company's treadle fret saw and lathe combined, complete with drill, circular saw, grindstones, emery wheels, &c.; cost eight guineas, as new, for a really first-class quarter-plate hand camera, good maker.—Address, W. STARKEY DOWNES, Rembrandt Art Studio, Sleaford.

Wanted, a Watson's 12×10 Premier camera and three slides in exchange for a Meagher's 12×10 camera, one double and one single slide, extending front, and Marion's 13×8 studio panel camera and three single slides (roller blinds) in perfect order.—Address, F. KINGSBURY, 16, Belle Vue-road, Upper Tooting, S.W.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Thomas C. Brooke, Walton-on-the-Naze.—*Two photographs of ss. "Elbe" lifeboat, No.* 3.

John Yeoman, Bedale.—*One photograph of Frederick A. Milbanks, Powlett C. Milbanks, and Frederick Milbanks.*

Harry John Dalby, 82, Wellington-street, Woolwich.—*One photograph of the ice-bound Thames, showing the free ferry across the river, with ice blocks.*

Wilkinson & Co., Norwich.—*One photograph each of the opening of the Norwich Castle Museum, by the Duke and Duchess of York; H. Rider Haggard; and the group of the Norwich Council.*

H. THORNE.—Why not try another make of plate?

C. BANYARD.—A tele-photo lens will not do for a fixed-focus hand camera.

H. HANDS.—1. Yes, the idea has been anticipated. 2. It is not of much commercial value.

CASCIANI.—See pp. 827-90 of the ALMANAC for 1895, where several formulæ for amidol are given.

PYRO (Londonderry).—Black chalk and black crayons are much used for working up bromide enlargements.

H. RENDREW.—Our informant tells us the address ought to have been given as 56, instead of 50, Grafton-street, Tottenham Court-road.

L. S. D.—All the brands of plates named are good and may be relied upon. It is opposed to our rule to recommend any particular maker's goods.

Old Fix.—If you can refer to the *Journal of the Royal Photographic Society* for the last two or three years, you will find the information condensed.

T. E. Bateman.—Your conversion of the formula into English weights is practically correct. The formula is given as it appeared in the journal quoted.

M. C. H.—The table in the Almanac shows the degrees of enlargements with lenses of various foci without any calculation. You can see what you require at a glance by its consultation.

G. W. G.—We do not know of any firm that undertakes that class of work. Possibly an advertisement might put you in communication with some one who would supply your requirements.

P. Krummel.—A final polish may be given to a lens by facing the polishing tool with either thin soft paper or woven fabric, and employing rouge and water as the polishing substance. Some prefer a mixture of rouge and putty powder.

Pyro.—The copyright is vested in the one who painted the cartoon. If he has disposed of it to any one else, or given him a licence to copy it, he is entitled to do so. But, if you have not received a similar licence, and reproduce the work, you are liable to proceedings under the Copyright Act.

W. N. says: "I should be much obliged if you would tell me what is the specific gravity of a ten per cent. solution of ammonia ·880 in distilled water at 15° C."—According to the table of Lunge and Wiernik, as given on page 565 of the Journal for last year, the specific gravity would be 0·960 approximately.

Col. Brom.—If the instructions were carefully followed as given, a good emulsion would have been obtained, supposing, of course, that a suitable pyroxyline was employed. The only suggestion we can make is, that an unsuitable one was used. Get one or two more samples from different sources and try again.

Flash.—1. We should recommend you to protect the idea, which, from your description, seems a good one. 2. Possibly the better plan would be to dispose of it right out to some manufacturer. 3. The effect acetylene is likely to have on the sale of your apparatus cannot be conjectured. Wait till "acetylene" is commercially obtainable.

T. Bust.—If the Electric Lighting Company do not supply the current during the daytime, the only thing we can suggest is that you instal an engine and dynamo yourself, unless you set up a series of secondary batteries, and charge them when the current is on, and use from them when it is not. Communicate with the Company on this point.

Saturator asks: '1. Are ether saturators safe in the hands of any one accustomed to lantern work? 2. In case of accident, what is the worst that could occur? 3. Which would you give the preference to: (1) Lawson's, (2) Gridiron, (3) Timberlake, or (4) Optimus?"—In reply: 1. Decidedly so. 2. A more or less dangerous explosion. 3. All, we believe, are excellent.

Collodion.—1. Place the centres of the lenses three inches apart. That will give you practically what you desire. 2. As we do not know with what the print was mounted in optical contact with the glass, we cannot say how it can be unmounted without injuring the colouring. Probably long soaking in water would separate it from the glass, but how the colouring, which we do not recognise from the description, would suffer is problematical.

Assam says: "I would be glad if you could let me know where I could buy ferric oxalate of known strength (by preference 100 grains per ounce or a twenty per cent. solution) and sensitive to light. I have tried several places including the Platinotype Company and failed. Griffin & Co. could supply ferric oxalate, but it had been exposed to light and this would not do."—Perhaps some reader can give our correspondent the information desired.

George Randley.—1. Not so much as with most other developers. 2. Burton's work on *Photographic Printing Processes*. 3. Any elementary treatise on optics that deals with photographic lenses will show you the difference in construction between the Petzval portrait lens and the rapid rectilinear form. Space cannot be spared to do so in this column, considering it has frequently been done in former volumes. 4. What formula is referred to? There are several formulæ termed "mercury intensifiers."

Sidney A. Stevens writes: "About the middle of last year, if I remember aright, you recorded the discovery by a foreign chemist of a new reagent for rendering gelatine films insoluble. I should be much obliged if you would kindly let me know the name of the chemist, the reagent used, and, if you can do so without trouble, the date of the English patent."—In reply: see the article *Prevention and Cure of Frilling in Gelatine Surfaces*, in the Journal of August 17 last, which gives all the information you ask for.

J. Bean says: "1. I have printed an album of local views (18); I wish to take out copyright. Must I copyright and pay a separate fee for each view, or will one fee copyright the entire album? 2. I wish to make a zinc block of a line drawing, and have made a print on transfer paper in greasy ink and have transferred same on to the zinc. I wish to etch it deeply. How is the ink on the zinc strengthened to allow deep etching? and what is the usual strength of acid solution employed?"—In reply: 1. You must copyright each view separately. 2. The process is described in the Almanac for 1893.

Robt. McConchie.—We have not found either gelatine or arrowroot very messy in our operations, and methylated spirit, though dearer than rain water, is not costly, considering the small quantity required in the preparation of the paper. However, try the solution quoted from the American magazine. It does not differ materially from the first except that there is more water. Some samples of lac form more viscous solutions than others, particularly bleached lacs. We should be very pleased to receive the pictures.

Hants.—The half-print sent is not a platinotype; it is simply a print on bromide paper, and not by any means a good one either. If it was, as you say, supplied as platinotype, it is a fraud on the sitter, and the photographer is liable to prosecution for a wrong trade description. Bromide prints are often, we fear, supplied for platinotypes, but never by respectable photographers. A bromide print can always be distinguished from a platinotype if it be touched with a solution of bichloride of mercury. That will cause the bromide image to disappear, while the platinum one will remain unaffected.

Varnish asks: "Can you kindly give me a formula for negative varnish that can be applied to the *cold* film? Some I have seen is poured on the cold film in the ordinary way, but only requires warming after varnish has drained, the preliminary heating being unnecessary."—Most of the varnishes given in the Almanac may be applied cold if the plate be heated directly the varnish is drained off. A solution of dammar resin in benzole forms a varnish that may be applied cold and allowed to dry without heat. But it is not so hard and durable as those with shellac as a base.

C. Bray says he has bought, second-hand, a pair of stereoscopic lenses of the portrait type by a London maker, and, although they bear consecutive numbers, one is decidedly more rapid than the other.—If the lenses were supplied by the maker as a pair, it is pretty certain that they are. Possibly fresh stops may have been supplied to one, and they do not exactly coincide in size with that of the others. It is more likely, however, that the interior of one of the mounts has become more polished in cleaning than the other. We should advise you to reblack the insides of both the mounts, and then you will probably find the instruments of equal rapidity.

Gerald Wetherman writes: "I should be much obliged if you could inform me whether the actual cost of wet-plate negatives has been exactly arrived at, taking into account the glass, collodion (silver, in each plate, developer, and intensifier) for half-plate to, say, 24×20. If you know of a table giving this information, would you inform me?"—No such table, so far as we know, has been published. If one had been, it would be of little value in practice. No two negatives, when finished, though of the same size, contain the same amount of silver. Again, sometimes a thicker collodion is used than at others, &c.

Ernyad says: "I am wanting to put up a studio in garden (24×12 or about), on brick pillar foundation. Where could I get the necessary instructions for having same built? 1. Do you think a local builder could put up same, or would it be best to get some one experienced in studio-erecting work? 2. Where can I get instructions for vignetting bromide or similar papers? 3. What do you recommend as being the best formulæ for producing black and white tones on a matt printing-out paper? I have tried one or two, but do not get them to a good black, but brownish black."—1. A local builder will do the work quite well if he is supplied with a design as to what is required. 2. No further instructions are necessary than for other kinds of paper. 3. The formulæ supplied by the makers of the particular paper to be employed. A formula that may be the best for one brand may not be the best for another. The papers of different makers are not alike.

A. J. W. writes as follows: "I have been much interested in your article last week with reference to print-washing and permanence, for it seems impossible to get such lasting prints as in the old time of wet plates, hence I have decided, after reading above, to adopt a fresh method; can you suggest improvements to following:—A thorough hand-washing for an hour, by which I mean passing each print from one bath to another, letting prints remain in each for about five minutes, after which removing to blotting-book, made of unbleached calico, ready for enamelling; or, when mounting with starch, a book made of same material for the purpose? I should also like answers to the following:—1. I use a small round wooden tub for fixing; is it best? 2. Should the calico be washed before use? 3. After being in use some time, will the ordinary method of washing linen suffice? 4. Do you know of a reliable spotting medium before enamelling?"—The plan of washing is good if the prints are well drained between each change, though we should prefer the time of washing a little extended. Replies:—1. It matters very little of what the vessel is composed, and, if of wood, it is kept solely for the fixing solution. 2. Yes. 3. The linen should be well washed with plain cold water—nothing else. 4. Ordinary water colour, mixed with white of egg, is what is most commonly used, though special colours for the purpose are sold by most large dealers.

CONTENTS.

	Page
A USEFUL APPLICATION OF SINGLE LENSES	161
TIME DEVELOPMENT	162
FURTHER NOTES ON A MODIFIED EMULSION. By EDWIN BANKS	165
FROM SUNSHINE TO SHADOW AND BACK.—II. By HUGH BREBNER	166
CHILDREN'S PORTRAITURE. By ARTHUR HANDS	167
PHOTO-MECHANICAL PRINTING PROCESSES. By ERNEST EDWARDS	168
DR. P. H. EMERSON ON THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION	169
RECENT PATENTS	170
THE No. 2 FRENA	170
OUR EDITORIAL TABLE	171
MEETINGS OF SOCIETIES	171
FORTHCOMING EXHIBITIONS	173
NEWS AND NOTES	173
CORRESPONDENCE	174
EXCHANGE COLUMN	175
ANSWERS TO CORRESPONDENTS	175

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EQUALISING THE ILLUMINATION OF A PHOTOGRAPH.

It is self-evident that the centre of a plate which is nearer to the lens than its margins must be better illuminated than those margins. For this there are various reasons. The diaphragm in relation to the centre is circular, and transmits the maximum of light, and therefore the angular aperture is larger than that by which the sides are illuminated, for, in proportion to the obliquity of the diaphragm to the pencil of rays that are being transmitted, so does the aperture become elliptical and smaller. The focus of axial rays is shorter than is that of oblique ones, which must be elongated, for, were this not the case, we could not get flatness of field. Here, then, are two factors. From the operation of these factors the conclusion must be deduced that the intensity of light in the centre of the plate exceeds that by which any other portion is impressed, and hence that there is a falling off in illumination as we depart from the centre. Besides, there is a loss from oblique impact of the rays on the plate.

All this is theoretically the case. Fortunately, in practice, unequal illumination is but little observed, unless the covering power of the lens is much strained. We have just examined a collection of photographs taken by almost every variety of lens, and see very little to find fault with as regards equality in their illumination. There is only one exception in the collection, and in it the sides are so dark, as contrasted with the centre, as to lead to the conclusion that it must have been intentionally made so in order to give effect, and cause the eyes to rest upon the chief theme of the picture—a cosy little cottage nestling in a garden, through which meanders a small stream. In this case, if the plate had been equally as well lighted at the sides as in the centre, the pictorial merit of the photograph would have been lost. As we have said, in the ordinary every-day practice of photography, with either a landscape lens or any other objective having a diaphragm between the lenses, the disparity of the illumination need not be taken any cognisance of unless when an angle of view abnormally large is to be included.

To meet the marginal falling off in this latter case, it was one of the claims made on behalf of the now nearly extinct orthoscopic lens that its illuminating powers were more equal than that of the others then existing, and, as we have said elsewhere, much was said and written even by talented opticians of the period (*e.g.*, Andrew Ross) to prove its superiority in this respect over the single achromatic landscape lens; but, although we possess some of the best specimens of this kind of lens that have ever been made, we have altogether failed to discover any superiority in this respect over ordinary lenses.

When it was realised that the orthoscopic lens was no better than the ordinary one, the late Mr. Thomas Grubb, of the Bank of Ireland, to whom the optics of photography owe so much, made the statement that the end would be attained by simply placing a small circular piece of brass or other metal a little distance in front of the aperture in the stop, which had to be larger than the piece of metal spoken of. This diminishes the intensity of the light at the centre of the plate, and allows that which is transmitted obliquely to pass without interruption to the margins.

A system which we adopted some years since with highly satisfactory results consists in placing at a little distance in front of the diaphragm a small piece of blackened brass or black card of a V shape, base upwards. One or two trials will suffice to determine its best position. This fulfils the following conditions:—It gives a proportionately greater illumination to the foreground than to the sky, and, while it diminishes to any required extent the intensity of the light falling upon the centre of the plate, it gives a great increase to that by which the sides are illuminated. Added to these, it costs nothing, and can be applied by any photographer to his lens without any disfigurement of, or tampering with, the brass work, for the whole appliance can easily be made and fixed in a few minutes by means of a pair of scissors, a bit of stiff black paper, and a little mucilage. When making our original experiments with this device we succeeded in actually turning the tables, so that the foreground was better illuminated than the sky, and the margins much more so than the centre, a wide angle of subject being included.

A seemingly complex system for effecting a similar purpose was brought before the Royal Photographic Society at its last meeting. It is the invention of M. de la Crouée, and consists of a sector aperture, cut in a circular piece, capping the lens, the apex of the V-shaped opening corresponding with the axis of the lens. If this is made to revolve during the exposure, it will have the effect of allowing but little light to be transmitted axially compared with what is transmitted obliquely, the result being the equalising of the illumination. The necessity for having this equaliser in motion during exposure will probably lead practical photographers to adopt one of the simpler methods of attaining the same end, that is, if

they should consider it worth while to adopt any of them at all, which we scarcely suppose will be the case.

Were it at all necessary, the opticians could provide for equalising the light through a landscape lens by adopting the suggestion of Mr. R. H. Bow, made many years ago, of having the crown or positive element of a landscape lens formed of glass having a greenish or other slightly non-actinic colour. The thickest portion of this, being in the centre, would interfere with the easy transmission of central rays, allowing the oblique one to pass more readily.

PRACTICAL HINTS ON STUDIO-BUILDING.

THE number of letters we are now receiving indicates that the season is at hand when photographers — professional and amateur — are seriously considering the question of new studios, or the repairing and renovation of such as they now possess. Consequently, some general practical hints on the subject, which may tend to the avoidance of inconvenience in the future, may be acceptable to the uninitiated in studio-building. It is not our intention on this occasion to go into a disquisition as to the merits or demerits of the various forms of studios that have from time to time been advocated, and for this reason, in the majority of instances a studio cannot be erected as its owner would like to have it, but has to be built according to the space and, sometimes, means at his disposal, as well as the aspect available, coupled as well with the requirements of Building Acts, district surveyors, or other local authorities. It may be mentioned, however, that good results may be obtained in all the recognised forms of studio by workers of ordinary ability. The object of this article is merely to call attention to some minor points that are too often overlooked in the erection of new studios.

One very common fault in photographic studios is an unnecessary amount of glass. At one period, in the early days of the art, it was thought that there could not be too much, the idea being that the more light there was in the room, regardless of its direction, the shorter would be the exposure. It is needless to say that that fallacy has long since been dispelled. Yet we find even now new studios being put up in which there is far more glass than is really necessary, the designer's notion, doubtless, being that any excess can be obscured by blinds, and therefore it is better to err on the side of having too much light than too little. Now, as a matter of fact, any excess of glass over what can possibly be utilised is a positive evil. It entails additional blinds, which get dirty; it causes the studio to become unnecessarily hot in summer, and correspondingly cold in winter. Further, a glass roof is much more difficult to make and keep in a watertight condition than is any other, and a leaky roof, by soiling the blinds and curtains, and staining the accessories, causes a studio to have a shabby and dirty appearance quicker than anything else.

One of the most important items to be considered in the construction of a studio is stability, and that is frequently overlooked from the beginning. With the view of obtaining as much light as possible in the room, and sometimes for cheapness, the sash bars are made far too slender for their purpose, and, as a consequence, they bend considerably with a strong wind, the result being that, when the putty has become hard, it cracks, and in the end the roof leaks, and the blinds, &c., become stained. Frequently the sash bars, when of wood, are made of unseasoned stuff, and as a consequence, they shrink considerably with the heat of the sun, and thereby draw the putty away from the glass, thus causing leakage. Few appear to realise the heat that sash bars attain on a hot, sunny day, and it is a noteworthy fact, though not very generally known, that the sash bars are always very much hotter than the glass. Sometimes they become so hot that the hand can scarcely be borne upon them, yet the glass is comparatively cold.

An important thing in connexion with the glazing of a studio roof is the putty employed. That frequently used is quite unadapted for the purpose. Some years ago a nurseryman of our acquaintance, who had quite a small village of conservatories and greenhouses, told us he never intrusted the glazing of them to the builder, but always had it done by his own men, under his immediate supervision. Here is the method he adopted: After the builder had completed his part of the work the sash bars were given a coat of thin paint, which soaked well into the wood as it dried. They were then given a second coat of thicker paint, and, while that was still wet, it was dusted over with fine silver sand, and when dry the excess of sand was brushed off. This was said to give a toothed surface to which the putty held more tenaciously than it does to a smooth one. The putty employed was made by himself. It was composed of the best linseed oil, whiting, and a good proportion of white lead. Of course, such a material as that could not be expected for the price at which the commercial putty is sold. Whether it was the system adopted, or the careful workmanship, or the two combined, we cannot say, but we do know that a leaky roof was a rarity in that nursery. A photographer of our acquaintance, instead of painting the outside of the roof sash bars every spring, gave them a coating of gas tar, his idea being that, while the tendency of the heat is to harden and crack the putty, it would, at the same time, soften the tar, so that it would fill up the cracks in the former. Tar is very repellent of water.

A good slope in the roof is a desideratum, for, with it, there is less liability of the water finding its way through, as well as less liability to breakage in case of hail storms, than when it is flatter. If the studio be large, or there is a great expanse of glass in the roof, it may be desirable to have a stout iron bar —'T or angle iron'—fixed under the sash bars—midway between the ridge and the eaves—to prevent their yielding, and so causing the putty to break in stormy weather. Too great a lap in the panes of glass is as great an evil as having too little, as with deep laps the water accumulates between by capillary attraction, and gets blown inside if the wind be strong. Further, deep laps offer a harbour for dust, and thus obstruct light.

Thicker glass is desirable for the roof than is necessary for the sides. Twenty-one ounce sheet for the former and fifteen ounce for the latter, if the panes are not unusually large, will suffice. As regards the kind of glass to be used, the ordinary sheet glass for glazing purposes, as met with in the market, is as good as any. Some of the whiter and more expensive kinds, which might otherwise be preferable, are prone to change in colour and assume a more or less yellow tint, and thus stop out actinism. This, however, is not of the serious import with gelatine plates that it was in the days of wet collodion. As a matter of fact, however, it may be mentioned that far more actinism is obstructed by the smoke and dirt that accumulates on the glass in the course of a month or two in large towns than is stopped out by any change in the colour of the glass itself, even with years of exposure. It is a well-known fact that some of the cheapest window glass is less

liable to alter in colour than is some of the more expensive ones. Hence it is, as a rule, quite as safe, in practice, to rely upon the cheapest glass as on the most costly kind in the erection of a photographic studio.

INTENSITY FIRST, OR DETAIL?

METHODS of development naturally vary very much with the exposure, and the system that gives the best result under one series of conditions does not necessarily answer under others. Thus, while under ordinary circumstances attention is given to the general gradation and density of the image, in cases of very short exposure everything must give way to the attainment of detail in the more feebly lighted portions of the picture, to, in fact, the production of the best image that can be obtained without immediate regard to the gradation. Under the latter circumstances, the result cannot, of course except perhaps by accident, be better than a compromise, for no amount of care in development will compensate for the curtailment of exposure, although, by the exercise of such care, we gain the power of making the most of such exposure as has been given.

With a fully timed exposure the whole attention may be given, on the other hand, to the gradation of the picture without regard to the question of detail, except so far as the appearance of the latter is taken as a sign of the progress or completion of the development. Where, however, the filling in of the detail is accepted as any test of the density of the image, it can only be when the operator is perfectly familiar with the character of the plate employed, and the exposure has been accurately timed within very narrow bounds; when, in fact, the conditions are so thoroughly in unison that the process of development becomes practically automatic. Under such circumstances, little or no attention need be given to anything but the appearance of the detail, or the whole operation may be conducted on the time system, though the whole question of success or failure hinges on the possibility of adhering closely to normal conditions.

Under ordinary every-day circumstances, and in the production of the very highest class of work, there will be a considerably greater call upon the skill and judgment of the operator than is involved in the mere watching for detail or timing of development; in fact, the whole process will require to be carefully watched from beginning to end, and such modifications made from time to time as the progress of the image seems to indicate; for, without entering into a discussion of the scientific side of the question from the Hurter & Driffield point of view, there can be no doubt that the *art* of development lies in the careful watching of the progress of the image as it forms and its stoppage at the proper moment.

With the older forms of development it was customary to carry the process to such a point that a certain amount of strength or opacity was presented by the half-tones or mid-gradations of the picture, leaving the density of the high lights practically to look after themselves; and, under conditions, the results would be in every way satisfactory, since the visual strength of the image before fixing formed a fairly true guide to its actual printing value when finished. With some of the newer developers, however, this test is a far from reliable one, and the image, after fixing, is too frequently found to be sadly lacking both in density and gradation, although previously it may have been apparently perfect in these respects. In addition to this, with many brands of plates there exists a difficulty in attaining such a degree of density in the high lights as will give the necessary contrast and brilliancy to make a perfect picture, and for various reasons the need of intensification is frequently felt.

To obviate this difficulty, we have recently been experimenting in what may be considered a distinctly new direction, namely, the production of density in the earlier stages of development and of detail in the later, or a direct reversal of the usual process for "getting the most out of an exposure," in which a thin image possessing as much detail as possible is first obtained by means of a suitable developer, to be finally intensified by the addition of more pyro and bromide. In the method we have recently adopted, a strong and well-restrained developer is first employed to bring out what may be termed a hard image, and, when sufficient density has been secured in the highest lights, the details in the shadows are brought out by means of a solution containing less restrainer, and possessing less capability in the direction of density.

It does not matter to any great extent what developers are used, though the newer ones, such as amidol and metol, are especially suitable in the latter part of the process, not only on account of their greater power in searching out detail, but also because the excessive use of bromide appears with them to act less deleteriously upon the more feebly lighted portions of the image. Thus, if pyro be used throughout, there is always a tendency to the production of a hard picture, except in the case of a very full exposure, because of the check put upon development in the earlier stage, which no subsequent modification of the same solution appears capable of overcoming. Employing metol, however, in the final stage, it is immaterial what is used in the first place or within reason, however heavy a check may be put upon the shadows, and it has the further advantage that, while it brings out apparently as much detail as if used at the outset, it adds very little, if any, to the strength or density of the high lights.

For the first development the ordinary pyro developer may be used with shorter exposures than would be possible if the full operation were to be carried through with the same solution; in fact, with plates that offer any difficulty in giving density with metol or amidol, the advantages of pyro or hydroquinone in that direction may be combined with the greater rapidity of the newer agents; or, if preferred, the latter may be used throughout, and either two separate solutions employed, or the same one modified as required. The last-named method necessarily entails the employment of a fresh solution for each negative, while two separate solutions admit of the modern system being adopted of using the same developer over again, one being reserved for the production of density, the other for detail.

In carrying out this system we prefer to rely entirely upon metol, or the combination of metol and hydroquinone, which has been previously described in these columns. For the first development we use the ordinary formula with the addition of from one and a half to two grains of bromide to each ounce, and apply this until the high lights appear perfectly opaque, and perhaps apparently overdone, while the shadows still remain clear, or nearly so. With an image of this kind it is far easier to judge the apparent density than in the case of one possessing full gradations, for the delicate modulations and half-tones of the picture tend rather to distract the eye from an accurate estimation of the real density, besides giving the

false idea of strength that leads to so many of the failures with metol and amidol.

When sufficient density has been arrived at in this manner, the application of a solution of normal strength, without any bromide at all, will very quickly bring out the detail lacking in the shadows, and also strengthen the half-tones up to a certain point without, as already stated, materially affecting the parts already exhibiting full density. Should there be any difficulty in bringing out the details, it will be on account of under-exposure, and, under such conditions, it will be advisable to wash the film well between the two developments in order to soak out as much as possible the free bromide contained in the film. Except under these circumstances, it is preferable to apply the second solution without washing off the first.

Of course, in cases of known under-exposure, we do not recommend this method, but only where it is known that a proper exposure has been given. For ordinary work, and especially landscape, it is particularly suitable, the advantage lying in the greater ease with which the true density can be judged for one thing, and the greater power of arriving at brilliancy and contrast in the other.

"Photo Tea."—A correspondent sends us the following hand-bill which is being circulated in his town; we should assume that the quality of the tea could not be very high—to say nothing of the photographs: "Your portrait in the best style, gratis with photo tea. On every packet of the Photo Tea Company's specially selected full value teas there is a coupon for the amount paid. Ten shillings' worth of these coupons will entitle you to three *cartes-de-visite* of yourself, your child, or your friend, finished in high-class style, free of charge. Fifteen shillings' worth of coupons entitles you to six *cartes-de-visite*, and so on. To be had in quarter-pound, half-pound, and one pound packets at 1*s.* 4*d.*, 1*s.* 8*d.*, and 2*s.* per pound."

An Exhibition of Wood-engravings. — Under the auspices of the International Society of Wood-engravers, an Exhibition of the Wood-engraving Art was held last week at Stationers' Hall. Several of the large publishing firms and illustrated newspaper proprietors sent specimens, many private collectors also contributing. It may be briefly said that the art of the wood-engraver was here illustrated at its highest mark of excellence. It was a rare treat, in these days of photo-mechanical reproductions, to have an opportunity of contemplating works from Bewick downwards, betraying evidences of individuality in style and treatment which the wood-engraver does so much to accentuate or preserve. It is intended to make the Exhibition a periodical one, and it may be permissible to wish the Society every success in its laudable attempt to rescue wood-engraving from the obscurity that is popularly supposed to threaten it.

Colour in the Dark Room.—It has often been observed that a bright scarlet uniform will in a good photographic dark room, with ruby glass windows, appear perfectly white. On this subject, says *Nature*, Herr H. W. Vogel made some interesting communications to the Physical Society of Berlin at a recent meeting. Experimenting with oil lamps provided with pure red, green, and blue colour screens, he found that, when white light was rigidly excluded, all sense of colour disappeared to the observers, and nothing but shades of black and white could be distinguished on objects in the room. He further found that a scale of colours illuminated by red light showed the red pigments as white or grey, which abruptly turned into yellow, and not red, on adding blue light. Hence a colour was perceived which was not contained in either of the sources. Red and yellow patches appeared of the same colour, so that they could hardly be distinguished. But the difference was at once brought out by adding green instead of blue light. How very much the kind of sensation experienced depends upon the intensity of illumination is easily seen in the case of the region of the spectrum near the G line of Fraunhofer. This region appears violet when its luminosity is feeble, blue when it is stronger, and may even appear bluish-white with strong sunlight, so that the assertion often made, that with normal eyes a definite colour sensation corresponds to a different wave-length, cannot be upheld. Herr Vogel comes to the conclusion that our opinion as to the colour of a pigment is guided by our perception of the absence of certain constituents. Thus a red substance is only recognised as such when light of other colours is admitted, and we perceive its inability to reflect these.

Lectures on the Chemistry and Physics of Development.—The second and concluding lecture by Mr. Bolas on *The Chemistry and Physics of Development* was delivered on Monday last at Cordwainers' Hall. Sir H. Trueman Wood again occupied the chair. The lecturer dwelt on the influence of sensitising bodies in the action of light, quoting an experiment of the late Dr. Taylor, which showed that silver nitrate was not decomposed by light, except in the presence of water. Thus, as regards the haloid salts, water, or other sensitiser, might be supposed to attract the chlorine. An excess of haloid present prevented decomposition by light, and actually undid its action. This was not the case with heat, as the lecturer demonstrated by experiment. After noticing the cohesive properties on conductors exerted by the action of the Hertzian radiations, he argued that the same effect took place in light, the conducting power of certain bodies being so increased by that influence. Professor Lodge had put forth a theory of light which implied that the effect upon the retina would he that of a relay action. Mr. Bolas thought the action of development might depend upon the closing of an electric circuit, and quoted Meldola's theory as to minute particles of silver being liberated by light in the presence of a sensitiser, and so giving the necessary connecting link for the circuit. The principle of the development of an image on bitumen was then illustrated, and the *rationale* of Daguerreotype development was glanced at, the theory of accretion being considered by Mr. Bolas as probably rather crude. The Rev. Mr. Kingsley, he said, showed at the Society of Arts, in 1853, that a plain solution of pyro could develop the image on a Daguerreotype plate, the action of mercury in this case, being probably a reducing action, and analogous to that of pyro. An oxidising body, peroxide of sodium, has recently been found by M. Le Roy to exert a developable action. After other experiments Mr. Bolas concluded his lecture by remarking that the line he had taken might indicate that a promising field of investigation was open. Votes of thanks to Mr. Bolas, the Cordwainers' Company, and Sir H. T. Wood for presiding concluded the proceedings.

Bursting of a Gas Cylinder.—On Friday afternoon, March 15, an explosion of an oxygen cylinder took place at Fenchurch-street Station, which was unfortunately attended with fatal results. According to one account, the 3.23 express for the Albert Docks had left only about five minutes, and one or two passengers were pacing up and down, waiting for the next train, when they were startled by a report like the discharge of a cannon, the air being immediately filled with a cloud of dust. A man was then seen lying across a porter's barrow, and, on the bystanders running to his assistance, he was found to be dead. A fragment of a steel cylinder was lying near. An eyewitness, who was among the first to reach the poor fellow, states that, having missed the 3.23 train, he was walking slowly along the platform, and was about thirty yards from the spot where the accident took place, when he saw a flash of red light, which was immediately followed by a deafening report. His first idea was that another electricity and gas explosion had occurred, and he waited a few seconds in expectation of a second crash. As the dust cleared away he saw the man lying on a barrow, and ran up to him, when he discovered that the body had been terribly mutilated, the right leg and part of the abdomen having been blown away. The leg was subsequently found on the line beside the plat-

form. Near the body was a fragment of a steel cylinder, which the gentleman recognised on a second glance as the lower end of a bottle used for the storage at high pressure of gas used for lanterns. About three yards away, in a niche in the wall, was a seat, which was completely shattered, the cast-iron portions of its frame having been scattered in all directions, but, so far as he could see, the platform below was not injured. Overhead a lamp had been smashed, and the clock which faces the station-yard had been stopped, the outer dial being most damaged. About eighteen feet from the wrecked seat is a bookstall, and the man in charge had a wonderful escape. The conclusion arrived at by several of the witnesses was that the man had been sitting with the cylinder by his side when it exploded, with the disastrous result recorded. By great good fortune, the platform was almost deserted at the time of the accident. Had it occurred five minutes earlier, or in a crowded railway carriage, the loss of life might have been still more lamentable. In the evening the deceased was identified as John Holbrook, of 87, Grange-road, Plaistow, a gardener, employed by Dr. Kennedy of that place. It appears that Holbrook had been in the habit of coming up to town at intervals to get the cylinder charged with compressed gas. Various conjectures and speculations have been rife as to the cause of the explosion, but nothing of a reliable or definite nature can be ascertained until the result of the inquest is made known. This was to have taken place on Wednesday forenoon, and we hope to have an account of it in our next.

JOTTINGS.

A MATTER that causes much heartburning among photographic operators and assistants is the detention and misuse of their specimen photographs submitted in reply to advertisements. Time after time has the subject received attention in these columns, the owners of the specimens being always recommended to inscribe their names on them in such a manner as to prevent their being wrongfully used, and so increasing the chances of their return. And yet the old grievance is continually cropping up, and neither the turpitude of the anonymous advertiser nor the folly of the helpless noodles who reply to his advertisements seems to diminish in the slightest degree. Just now the correspondence columns of a non-photographic contemporary are given over to the lamentations of numerous ladies who, having submitted photographs in reply to an advertisement, are unable to get them back. It will thus be seen that the minor grievance of the detention of submitted photographs occasionally agitates other worlds than ours.

Like Henry Mackenzie's "Man of Feeling," I am of a highly sympathetic temperament, so that I am naturally inclined to take the part of the weaker side and condole with the unfortunate assistants who are ruthlessly robbed of their specimens of work by wicked or unprincipled photographers. But, alas! the truth of the matter obliges me to own that the assistant is himself probably, in most cases, more to blame for the detention of his specimens than the advertiser. Chatting over this very subject with one of the largest photographers in England not long ago, he suddenly opened a large drawer containing some hundreds of "specimens" sent in reply to an advertisement he had recently inserted in this JOURNAL. "Look there," said he, "most of those specimens were sent separately, and not with the letters of application, so that it is impossible for me to tell which is which, and very few had stamps enclosed for the return of the photographs. I should be only too happy to put a boy on to the job of sending them away if I knew where to send them! And, oh, the letters of abuse I have received!"

I know from experience how careless most people—particularly female people—are when answering advertisements which ask for photographs to be submitted. Some years back I had occasion to advertise for the services of several young ladies as—well, say as typewriters, and they were requested to send me their photographs. A great many of the photographs came in separate packages, and so could neither be identified nor returned, through the simple precaution of a written inscription being omitted. These photographs, mostly of young and pretty women, remain in my possession to this day, and are the cause of many small outbreaks of jealousy on the part of my excellent wife. The money side of the question we are discussing is also of importance. Says a correspondent of the paper I have referred to, who had advertised for the services of two ladies: "I had 425 answers. Of these, 300 contained photographs, and, of these 300, only eighty-five had stamps for return. Perhaps Miss —— will tell me what I should have done with the 215 photographs for which no stamps were sent?" Quite so. On the whole, I fear it will be found in most cases that the detention of specimens by photographers and others arises from the carelessness and stupidity of those submitting them.

Here is a suggestion made by a gentleman who took part in the discussion above alluded to by which both the public and photographers might gain. Said he in effect: "To save trouble and the loss of photographs, why should not ladies and gentlemen have their photographs lithographed on their note paper?" I think the suggestion an excellent one. Photographically, the idea is perhaps not entirely new, but it is, I repeat, excellent. Where, then, is the enterprising photographer, anxious for a new style of portraiture, who will tempt his sitters with note-paper portraits or at-home views, printed in half-tone or collotype, at a moderate price? I don't hesitate to say that a small fortune here lies ready for picking up by any photographer who will sink a little trouble and capital in the idea. I fully expect one day to read that some exalted or fashionable lady has set the lead in note-paper portraiture, and when this occurs be sure that the common herd will follow, and that a boom will be started of which photographers will take instant advantage if they are wise.

It is of interest to note that the Council of the Royal Photographic Society has decided to set apart a certain number of evenings for the discussion of photo-mechanical process subjects. Although I fear this decision has been arrived at about five years too late to be of much practical value, I congratulate the Society on giving evidence of a desire to fall in with the views or wishes, as far as possible, of all classes of its members. My own sentiment on the point is, that what is required by photographers and others interested in process work is not so much the opportunity of listening to and discussing "papers," but practical demonstrations, and, above all, facilities for experimental work. The last, I suppose, will come in the sweet by-and-by; in the mean while, let us go on talking and discussing. It does no harm; it may do good.

Talking of process matters, I am glad to find that many photographers are at length showing a disposition to add a process department to their businesses, but it is only right to point out that the possible opportunities of success are being daily narrowed down with unfaltering sureness and rapidity. We may broadly divide photo-mechanical work, or such of it as is in general demand, into three branches—photogravure, collotype, half-tone zinc and copper etching. For the first two kinds it is, I think, safe to say that there is absolutely no hope of financial success with new enterprises unless the quality of the work be of the very highest class; the ground is well and fully covered both at home and abroad. Of zinc and copper etching I have more hope, especially away from the larger towns, such as London, Birmingham, Liverpool, and Manchester. The rapidity with which a plate can be etched and mounted type high ready for being placed on the machine, and the fact that all the operations except the latter are purely photographic, should induce many a country photographer to take up the process with the certainty of increasing his business and his income.

I have hinted that in large towns there is little inducement for the photographer to launch out into zinc or copper-block etching. London in particular, I happen to know, literally swarms with process firms that have started recently, and competition is about as keen as it well could be. Of this last point nothing can be so eloquently

illustrative as the gradual fall in prices that has taken place. Three years ago a photo-engraver would quote you, for small orders, eighteenpence per inch, with a minimum of probably 10*s.*; to-day, the same man might ask 6*d.* an inch, with the same minimum. Continental houses quote 5*d.*, and deliver almost as rapidly as London firms. "Still," to make use of the old saying, "there is always room at the top," and it is at the top that I recommend the would-be photographic block-maker to aim. As I know that these "Jottings" of mine are regularly read by large numbers of professional photographers all over the country, some of whom may be writing to me for information on the subject of the last few paragraphs, I will anticipate them by referring them to the ALMANAC for 1893, which has an article on *Modern Methods of Book Illustration*. This gives a nutshell account of the various photo-mechanical processes in present vogue.

I should like to know what a "reverent" reproduction is. The term is being applied to a facsimile of the Holy Coat of Trèves and its cathedral surroundings, which is being exhibited in London at one shilling per head. Reproduction implies fidelity of resemblance to the original, and, as there is no possibility of "irreverence" in that, it is difficult to see why the probability should be canvassed by the use of the term "reverent."

What a laughter-provoking book could be compiled of amateur photographer stories! If there is one pursuit more than another which gives a thoughtless or simple-minded young man the smoothest and most seductive chances of making an amiable ass of himself, it is photography! Here, for example, is a tale—a true one—the hero of which we can all, as it were, identify among our own circle of amateur photographic acquaintances. An amateur photographer called on his dealer, and complained of opaque spots on the plates he was using. Of course he alleged the plates to be at fault, and he was importunately solicitous to know how the spots could be got rid of. Driven to desperation by the amateur's mingled obstinacy, persistence, and ignorance, the dealer's assistant finally recommended the complainant, in answer to the latter's inquiry as to what he should do with the negatives, to take them home and boil them. Two or three days afterwards the amateur reappeared on the scene. "I boiled the negatives," he told the assistant, "*but the gelatine all came off the glasses!*" Fact! To quote funny Mr. R. G. Knowles: "*Tableaux vivants! There's* a picture for you!"

There died the other day an excellent old gentleman, Sir Thomas G. Parkyns, whose name in former times figured in connexion with one or two patents concerning, if I remember aright, modifications of the carbon process. These, however, never came to a head. I last met Sir Thomas about fifteen years ago. He had then caught the fast-spreading cycle fever, and he showed me, with much pride, a ponderous steam bicycle he had invented, and which he confidently expected would be the bicycle of the future. I remember subsequently reading that he put the machine to practical trial over the Kentish roads, with the result that the authorities swooped down upon him, and got him fined for his pains.

There is a letter in the last number from a Mr. Coe, of Bath, which inferentially suggests that, because these "Jottings" are written anonymously, therefore they are not straightforward. Mr. Coe calls himself a "young" professional. Youth, we know, has the unchallenged monopoly of many things, including impertinence, and, on these grounds, it is forgiven numerous *lâches* for which maturity or age is never held excused. When Mr. Coe has arrived at an age that confers the possession of soundness of judgment, he will hesitate to enter controversies in which he is not qualified to take part, and will so reap a rich reward by saving himself from appearing ridiculous.

The following short and enigmatic epistle has reached me: "Envious Yahoos: How these *Christians* love one another!" It is signed "Chevalier Bayard." I wonder what it means? COSMOS.

SCREENS.

OF the screens in use there seem to be three tolerably distinct varieties: those produced photographically, as Wolff's; those produced by ruling lines in the glass, as Levy's; and those produced in Germany by ruling a clear line through an opaque coating on glass. The first class have been produced in many ways—sets of lines have been engraved on stone by means of a diamond ruling machine, as that of Klimsch, the usual course being to coat the surface of a lithographic stone with gum and some colour; through this coating the diamond cuts or scratches a series of lines, into which ink is rubbed, and the usual method of printing from an engraved stone is pursued and impressions pulled.

Stone seldom yields a good rich clear proof, and Kloth, of Stuttgard, produced some wonderfully perfect plates, ruled upon copper impressions, of which about thirty inches square were utilised largely for the production of screens. The proofs were sold either single line or crossed, and were much more suitable and perfect than those produced from stone. From the single-line impressions negatives were made by reduction, and used as screens. In the event of large sizes being required, it became necessary to join up several impressions, and in all large early work such joins may be detected. Many attempts were also made to rule tints upon wood, as used by engravers, for surface printing, but, in attempting to line or tint over large surfaces with a uniform tint, it was found the tool wore altogether too quickly, and a variation in the tint soon appeared. Again, the wood would not stand. To meet this latter difficulty, plates of what is known as "surface" metal were used, but the wear of the tool led to failure only. Max Jaffé, of Vienna, adopted the method of carefully covering a huge blank wall with a material bearing strongly contrasted stripes, and then sought, by reduction, to get the required sharpness. It would seem that Wolff uses a mechanically produced or factitious negative to produce his screens, which, it is understood, are made with a collodion emulsion plate.

The screens produced by Levy, which come under the second class, seem to find most favour, and their perfection is such as to create wonder, more especially to those who, like myself, have attempted something in the direction of making them. It has been asserted that, in the cross-line screen, both sets of lines are on one plate, and the second glass is merely a cover. In all my examples this is not the case, and the practical copper-plate ruler will realise the greater difficulty in securing a "ground" or "resist" that will stand the very fine crossing without chipping or dragging, compared with one to stand the single ruling. By ruling both plates, this tendency is reduced to a very great extent, and, should any mishap occur to one ruling, the other may remain intact and usable, while any slip in the second ruling would spoil both if crossed.

Another erroneous impression is, that the lines are ruled or cut with a diamond into the surface of the glass. Really, a plate is coated with a "ground" or resist, which is "ruled" or lined by means of a ruling machine, revealing the glass surface through the "ground." The glass so laid bare is then attacked or etched by means of hydrofluoric acid, until the lines are of sufficient depth to hold the colour, with which they are then filled in. Formerly the filling was a black pigment and shellac varnish, but latterly a pigment has been used of a peculiar reddish tint, strongly suggestive of rouge. Two of these plates cemented face to face with Canada balsam produce the cross-lined screens, the lines imbedded, as it were, within the glass. Perfect as these screens appear to be, there is usually a slight imperfection here or there, but the maker has stated, that to make them ten per cent. more perfect would increase the cost one hundred per cent.

The third class of screens consists of a glass plate, coated with some opaque waxy substance, and ruled through to the glass, showing clear spaces. The rulings are good, but the surface is delicate, and they should be used to produce negative screens from rather than directly. Certainly in the hands of the ordinary operator they would not last long, especially where wet plate is employed. I have never seen them protected with a cover glass, or placed face to face, to produce a cross-line screen as Levy does.

A few notes, the result of my experience in attempting to rule screens upon glass, may be of interest. The ruling machine used was one I had constructed for other purposes, and may be said to somewhat resemble the planing machine of the engineer. The table or bed will take a plate 18×22. The leading screw has twelve threads per inch, and is of a special character. The division plate having 200 divisions, it follows that the machine is capable of ruling 2400 lines per inch each eighteen inches long. The machine acted perfectly, and the real difficulty cropped up when it came to the resist. The surface of sheet glass being altogether unsatisfactory for screens, patent plate, bare one-eighth of an inch in thickness, is

used; this, having the outer skin removed in the process of polishing, the surface to be worked upon is much softer than ordinary sheet glass. An unwearing point is required, and a diamond naturally occurs first. This, however, was found too hard for the soft surface of the glass, even when tried with a "turned" point, and a turned sapphire was much more satisfactory.

The usual "ground" of glass-etchers consists largely of tallow or white wax, and, although answering well for the comparative coarse work of the glass-etcher, they are totally unsuited for the fine and prolonged ruling of the screen-maker. None that I have met with would stand a finer tint than eighty lines per inch, and were very liable to clog the ruling point. The most satisfactory compound, after many trials, consisted of Brunswick black, to which was added twenty per cent. of Canada balsam, and sufficient benzole to make the solution flow like collodion. Coat the glass as with collodion, and allow to set for ten hours before ruling. This resist will stand pure acid, which will etch to a sufficient depth in about one and a half to two minutes.

A point that will give rise to some astonishment to the metal-etcher is that the stronger the acid the deeper, cleaner, and sharper the lines, just the reverse of the usual experience. One cannot too often impress upon those likely to use hydrofluoric acid its very dangerous character. On no account should the fumes be inhaled or the hands come in contact with it, more particularly the ends of the fingers, as, even when dilute, it attacks at once the "quick" of the nails, producing great pain, and ulcerations which extend under the nails and cause their loss. Rubber finger-stalls should always be used. The etching should be done in a vulcanite or lead dish, the acid stored in a gutta percha bottle, and placed well apart from all other glassware, as, even when stoppered, fumes escape and attack anything in the immediate vicinity. There are two qualities of acid obtainable commercially, the ordinary and that known as the "white." For screen work the peculiar white character of the lines etched by the latter present no advantage, and, as it gives off more fumes than the ordinary, should be avoided.

EDWIN C. MIDDLETON.

LIVERPOOL SPRING EXHIBITION.

THE private view of the Corporation of Liverpool "Spring Exhibition, comprising Works in Black, White, and Water Colours, Architecture, Decorative and Applied Art, Photographic Art and Appliances," was held last Saturday and followed by a *conversazione*. This Exhibition, which is now open to the public, is a good example of how they manage things in the provinces. Under the ægis of a powerful and wealthy Corporation, everything can be, and has been, done to make the show the success such undertakings usually become in Liverpool. Take even the catalogue (price 6*d.*)—so often in exhibitions printed as cheaply as it is sold dear—it is very well printed on good paper, and is illustrated by a large number of process reproductions of examples of the various classes of works shown. Though the temptations to linger over the various unphotographic parts of the Exhibition were great, our duty lay only in the productions of the camera, and of them we may at once say that the collection was specially interesting from several novel points. There were extremely good and representative sets of process work of various kinds, photogravure, half-tone block, and line work; in fact, it is rare to see so large a space covered with this kind of work in photographic exhibitions. Of direct photography there were many good works, but the average was below that associated with the usual show held under the auspices of the Liverpool Amateur Photographic Society.

This Exhibition is, to a great extent, a series of one-man collections. Taking the pictures in the order of the catalogue, we find a series of photographs by Alexander Keighley of Keighley, over one hundred in number. The trained and cultivated eye of the artist is at once manifest in this fine collection, but we must in justice also point out that the trained hand also is manifest, and largely so in many cases. Almost every class of subject is treated by Mr. Keighley, but we think that, if he had exercised a little more self-repression and considerably reduced the extent of the collection, the merits of his work would have been seen to better advantage. His special *forte* is the introduction of figures and groups of figures, and this is done in a very happy manner in many cases, though in others the figure effect is too assertive. His two half-length single-figure pictures, *A Quiet Whiff* (No. 987), an old sailor in oilskin cape enjoying his cutty, and *His Last Resource* (No. 968), a sandwich man in a shocking bad hat, are effective and powerful studies. For clever grouping and harmonious composition we would direct attention to *Castle Building* (No. 998), *The Bird Trap* (No. 1008), and *The Missing Boat* (No. 911). *Springtime* (No. 963) is full of the flavour of the coming season, and the ever-present difficulty of the overpowering mass of reflections from green foliage fairly successfully grappled with. *Examples of Keramic Photography*, by the Midland Keramic Company, include a few portraits and landscapes, the latter pretty and bright, the former flat and devoid of vigour. A set of three pictures (No. 1084), by Arthur C. Balls, are well worthy of note, and we were much struck with Mr. V. B. Sutton's *Saturday Night* (No. 1091), a "skied" work probably on account of its being rather hard through over-exposure, but, nevertheless, one of great merit, simple but excellent composition, and eminently natural pose of the subject aiding in producing a true picture. Now that telephotographic discussions are rife, much interest will attach to *The Fort, New Brighton* (No. 1108), taken, in 1854, by George Thomas, by means of a telescope, with four-inch object-glass and six feet in length, from the town of Waterloo, three miles distant. In this room, under Nos. 1065 to 1076, we have a series of reproductions of drawings, photographs, by the Swan Electric Engraving Company, worthy of the highest praise, the great variety of technique in the original is reproduced in each case with equal merit.

In Room 6, still following the catalogue numbering, the first frames to attract are a series of photogravures by Hanfstaengl of the same high type characterising the process work of the Exhibition—crisp, bright, and rich. Portraits (No. 1124), by Harold Baker, are some good works, though the set we considered scarcely up to this artist's high standard. Messrs. Mowll & Morrison have, in the frames Nos. 1130 to 1159, thirty portraits of local and other celebrities. The Curator of the Exhibition, Charles Dyall (No. 1156), and R. R. Mead King, Esq. (No. 1149), are excellent, as is also a three-quarter-length standing figure of the Rev. G. A. Johnson, a good example of easy pose and fine execution. Our esteemed old friend, the veteran photographer, Mr. Alexander Forrest, loses by the retoucher's art, a fault not confined to this portrait alone, nor to this collection. Paul Lange's snap-shots of scenes on the river Mersey and river Dee, during the great frost, here printed on Hezekiel's paper. Of these it may be said this development paper gives far less crispness and force than is obtained in the lantern slides, though the unique effect of the grain peculiar to the paper is attractive, and, if capable of greater brilliancy from suitable negatives, has in it much promise. Barraud's exhibit comprises very varied types of photography, some extremely good; but the direct life-size portraits possess the failings inherent to that type of photography. Three enlargements, by Paul Lange (No. 1181), should be examined, if only on account of the difficulty of the work. Sunset and sunrise in latitudes where the sun is seen not very long after midnight has struck are here well brought before us, and the cloud studies thus obtained are very fine. Messrs. Robinson & Thompson are well represented by their portrait of Mr. Gladstone (Nos. 1187 and 1189), taken in the open air at Hawarden last year. The grand old man is truly so in an artistic sense, the dark mass of the bole of a huge oak forms an effective background to the figure, while the peep of landscape beyond reminds us of the effects Sir Joshua used to seek for his portraits. Messrs. Medrington too are well to the fore with a very varied collection of portraits; but the obtrusively show-case appearance of such a closely packed frameful of photographs prevents a due appreciation of some very beautiful examples of portrait work. Alfred Tyrer's (Nos. 1202–1204) are pretty pictures, marred by the most indifferent tones they are printed in. W. Tomkinson exhibits three frames, each with three landscapes, half of which are very beautiful examples of photography. He would have been well advised to reduce the number. Why, for example, should he give us two views of the mill in Dovedale, identical except that in one there are some cows introduced which do not appear in the other? Animal studies, by Gambier Bolton, most of which are familiar to us, are splendid examples of his work, his *Court of Appeal* (No. 1232) five bloodhound puppies sitting grave and earnest in a row, looking (slightly to alter an old saying) like Lord Thurlow, "wiser than any dog could possibly be," are exquisite representations of a most difficult set of sitters. Following our course through the room, we come across what at first might be taken to be studies in frames. Plain wood frames, in various shades of dead green, with or without gold lines, memories of the Salon apparently, surround, and in many instances kill, some splendid reproductions by F. Hollyer, mostly in platinotype. The Autotype Company have a large and varied collection of enlargements and reproductions worthy of high praise. A very good frame of studies, in various colours of "carbon," from negatives from nature were well "skied," and thus removed from close inspection; but the harmony of this set was interfered with by the top central picture, which looked quite "rusty" in comparison with the rest. The enlargement, *Rheims Cathedral* (No. 1292), by this firm, is a very fine picture, marred by the over-light sky, which prevents the full richness of this magnificent front from fully revealing its beauties; we have a dark sky overhead just where its effect is least needed. If the Company would take this criticism to heart, and next time they exhibit it make the suggested alteration, it would be difficult to obtain a more beautiful photograph of gorgeous architecture. We again come to fine examples of process work in the Berlin Photographic Company's exhibit. The photogravure, after Alma Tadema, *Unconscious Rivals* (No. 1309), is one of the most successful and beautiful examples of what photography, allied to fine perception, aided, no doubt, by the skilled hand of an artistic engraver, can produce. We must here again repeat our opinion that the whole series of process pictures is worthy of the highest commendation, and of itself is large and attractive enough to make the Exhibition worthy of a visit. The last picture our notes refer to is an interior, *Tewkesbury Abbey* (No. 1324), by Harold Baker, a picture in the true sense of the word and worthy of the highest praise. For skilful selection of subject, pictorial effect and

chiaroscuro, the whole suggesting a beautiful sepia drawing; we have never seen this photograph excelled if equalled.

The skill of the Liverpool Amateur Photographic Society in lantern-slide work is almost proverbial, and a selection of slides by some of the members of this Society shown here embraces some of the finest pictures of this kind ever shown. The palm must be awarded, though, to Paul Lange for his two sets of the subjects before referred to, instantaneous views on the ice on the river Dee during the great frost, and scenes suggesting Arctic views, at the same period, of the river Mersey. Mr. Lange must be as skilful with his skates as he is with his camera, for it is no slight feat to take snap-shots holding camera in hand while standing on the ice. The results comprise some of the best photographs of skaters, and skating scenes ever produced, some three or four being perfect gems of photography and pictorial arrangement. Liverpool and its Photographic Society are to be congratulated on the photographic section of the Corporation Spring Exhibition.

Our Editorial Table.

Cyclopædic Photography.

By E. L. Wilson. London: Dawbarn & Ward.

The idea of presenting photographic knowledge in alphabetic form is a good one. It was initiated in The British Journal of Photography (at that time the *Liverpool Photographic Journal*) so long ago as in 1854, and has since been perpetuated in serials and in book form, as in almanacs, dictionaries, and cyclopædias, several of which have been published since these early days. From the very nature of the thing and the constantly advancing state of the art, an encyclopædia cannot be supposed to be complete for all time, but only up to the date of its compilation, hence a new edition of any work of this class would have to be issued annually.

In Mr. Wilson's *Cyclopædic Photography*, the first thing observable is that the work has been indebted to the services of more compilers than one, and that each has sent his quota to the press without giving the editor a chance of harmonising the various statements to be found therein, or of affording him an opportunity of assimilating phrase with fact, and thus rendering the cyclopædia historically useful. For example, under the various headings of Burnt-in or Ceramic Photographs, Enamels and Porcelain Photography, we find no reference made to the labours and works of Lafon de Camarsac, but in another part, and presumably by some other member of the compiling coterie, that "this process is the invention of P. L. N. Foster, Esq., V.P." What the terminal letters to Mr. Le Neve Foster's name mean we are unable to say, but we do know that he claimed to be no more than the *Secretary* of the Society of Arts at the time when Mr. F. Joubert read the paper, in which he described his process before the Society. Mr. P. Le Neve Foster never claimed any invention for himself, merely because he happened to have an official connexion with the Society at which it was brought forward, and we mention this as an act of justice to the memory of a good man and true. Mr. Wilson tantalises us by some of the entries in his Cyclopædia. For instance, in one headed *Jones's Stereoscopic Glasses*, we are told "the invention consists of optical glasses giving a stereoscopic effect to *single pictures of any kind*, viewed through them with both eyes;" but not another word by way of description of these glasses, which any intelligent student of stereoscopic science is well aware never did, and never can, exist; but, as a set-off against much of the nature of those cited, there are many articles with which no fault can be found, so far as they go. We could have wished, however, that important processes of the present day had received more thorough treatment than some of them have; as an example, that the important subject of photo-micrography (the enlargement of minute objects) had not been dismissed in such a summary manner, whereas four columns are devoted to such a toy of the past as micro-photography (the reduction of photographs to be viewed through a microscope).

The editor says in the preface that the work has been drawn from a thousand authors. As no two think or write precisely alike, we can quite sympathise with him in the difficulty of making everything harmonise, and in his statement that he could no doubt do better if he were to begin and do it all over again. It is only when a book is completed and printed that one can detect errors that have previously escaped him. But surely the American photographers must have somewhat antiquated tastes, instead of being the go-a-head people we have hitherto given them credit for, to justify Mr. Wilson, who of all men ought to know what suits them, in devoting six columns to a reprint from Hints of the Calotype Process of Fox Talbot, three more to the Calotype Process on Waxed Paper, four more to the same thing further on in the book, seven more still further on, and still yet two and a half columns in addition in another place! Truly must the love for this process, which was discarded forty years ago in this country, be grafted deeply in the American mind if we are to judge by twenty-two and a half columns being here devoted to it. It is singular that we never see in modern American journals any allusion to this seemingly much-loved process being now practised. Photography on paper is occasionally still practised, but not the kind to which we are now making allusion. To read the book, one would imagine that the Daguerreotype was still being practised in America, so very detailed are the instructions given for practising it. There is much in both the chemistry and the optics that will cause surprise to a modern reader; but we account for this and other short-comings, by the evident surmise that the compilation had not been submitted to the editor before being issued in book form, and he has our sympathy, as it is he on whom the onus will fall.

But there is much that is interesting and suggestive in the volume for all that, subject to what we have said concerning its variety of sentiment. By the time a second edition is called for, the editor will have had an opportunity of scanning it over, and re-writing where necessary.

It is well got up, the typography being in the usual excellent American style. Price 12*s.* 6*d.*

Messrs. F. E. Jones & Co., of 33, Burlington-road, Bayswater, have sent us their price-list of photographic mounts, printing papers, &c. Mr. Jones was for nine years with the Platinotype Co.

The Epitome is the title of a gratis monthly circular issued by Messrs. Curtis Bros., Suffolk-street, Dublin, and devoted to the sale and exchange of photographic apparatus, &c.

Developers: Their Use and Abuse.

By Richard Penlake.

This forms No. 4 of Percy Lund & Company's "Junior Photographer's" series of handbooks. The author says it is imperative that the operator should know exactly the components of the developer he is using—why such-and-such ingredients are included and for what purpose. He answers this by giving a brief account of the peculiarities of the various developers in use at the present time. Price 6*d.*

The Lighting in Photographic Studios.

By P. C. Duchochois.

Since we last noticed Mr. Duchochois's very practical treatise on lighting, it has been revised and enlarged by W. Ethelbert Henry, and the *locale* of its publication transferred from New York to London. Mr. Duchochois we know to be a thoughtful practical man of great experience in lighting as in other branches of photography, and, although the book is not a large one, it is replete with matter of the greatest utility to those who aspire after having their studios well lighted and thus securing the best effects in portraiture. Mr. Henry's appendix too is of a practical character. Hampton & Company and Dawbarn & Ward are the publishers. Price 1*s.*

Valentine & Son's Catalogues.

One cannot adequately realise the nature and extent of the photographs which form the stock of Messrs. Valentine, of Dundee, until, as in our case, he has before him a set of the catalogues issued by the firm. We say "a set," for there are eighteen, the largest containing no fewer than 181 pages. They are all classified, some being devoted to Scotland, others to England, Wales, Ireland, New Zealand, Madeira, Norway, the West Indies—in short, it is difficult to say where the cameras of this eminent firm have not penetrated.

Birmingham Photographic Society's Exhibition.—The Tenth Annual Exhibition and competition will be held in the Exchange Assembly-rooms, New-street, on May 6, 7, 8, 9, 10, and 11, 1895. Mr. Sam. Timmins will open the Exhibition at 2 p.m. on Monday, May 6, and it will continue open from 10 a.m. until 10 p.m. each following day. Eighteen silver medals, bronze medals, a silver challenge cup, and other valuable prizes (besides certificates), are offered for competition. There will also be an exhibition of apparatus, and lantern entertainments will be given each evening. The Hon. Secretary is Mr. C. J. Fowler, 2, High-street, Birmingham, of whom particulars and entry forms can be obtained.

News and Notes.

MESSRS. ELLIOTT & SON, of Barnet, write:—"We notice an error in our advertisement of bromide paper last week. The size quoted 25×31 *should be* 25×*21*."

EASTBOURNE PHOTOGRAPHIC SOCIETY.—The Judges at the forthcoming Exhibition will be Messrs. Andrew Pringle, F. P. Cembrano, and Lieut.-Colonel Gale.

HOLBORN CAMERA CLUB.—The Annual Cinderella of this Club took place last Saturday evening in Anderton's Hotel. There was a large attendance of members and friends, and a very pleasant and enjoyable evening was spent.

THE West Surrey Photographic Society's Annual Exhibition was opened on Monday last at the Public Library, Lavender-hill, S.W. The display, if smaller than previous ones, comprised some excellent examples of work by Mr. G. H. James, Mr. Seward, Colonel Gale, and others.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, March 26, at eight p.m., at 50, Great Russell-street, W.C. *The Evolution of Photographic Objectives, with an Exhibition*, and a practical demonstration of *The Advantages of the Nicol Prism in Photographing Oil Paintings, Clouds, &c.*, by Mr. Birt Acres.

BRIXTON AND CLAPHAM CAMERA CLUB.—The fifth annual Exhibition of photographs and lantern slides will be held at Brixton Hall, Acre-lane, S.W., on Tuesday, March, 26, 1895, 7.30 to 10 p.m.; Wednesday, 27, 3 to 10 p.m.; Thursday, 28, 7 to 10 p.m.; Friday, 29, 7 to 10 p.m.; and Saturday, 30, 3 to 10 p.m. Lantern entertainments will be given each evening at 8 o'clock as follows:—Tuesday, *In the West Indies*, Mr. Andrew Pringle, F.R.M.S.; *Under the Broad Skies*, Lieut.-Colonel J. Gale. Wednesday, *Half Hours with the Vergers*, Mr. E. Dockree. Thursday, *The Scottish Alps*, Mr. W. Lamond Howie, F.C.S. Friday, *In Shakespeare's Country*, Mrs. Catherine Weed Ward; also the slides sent in for competition. Saturday, *The Rhine and Moselle*, Mr. F. Goldby. The prize slides will also be shown each evening.

BEVERLEY PHOTOGRAPHIC AND SKETCHING SOCIETY.—The Second Exhibition of Photographs, Paintings, and Drawings, in connexion with this Society, will be held in the Assembly-rooms, Beverley, on Easter Monday and Tuesday, April 15 and 16, 1895. Numerous silver and bronze medals and certificates will be awarded as prizes. The following are the Photographic Classes:—Section A (Open Champion Classes), for winners of *first* prizes at this, or any other public exhibition, during the past eighteen months: 1. Prints, any subject or process, Hand-camera Work and Enlargements admitted; 2. Lantern Slides (set of six). Section B (Open): 1. Landscape, Seascape, and Architecture; 2. Portraiture, Figure Study; 3. Hand-camera Work (six direct prints on one mount); 4. Enlargements (accompanied by print from negative); 5. Lantern Slides (set of six); 6. Photo-microscopic Work. Section C (Members): 1. Landscape, Seascape, and Architecture; 2. Portraits, Figure Study; 3. Club Excursion work; 4. Enlargements (accompanied by print from negative; 5. Lantern Slides (set of six). All entries and other communications should be addressed to the Hon. Secretaries, T. J. Morley, A. W. Pickering, Toll Gavel, Beverley.

"A PHOTOGRAPHER IN A COUNTY COURT."—An unusual incident occurred at the Exeter County Court yesterday afternoon. It occupied only a few minutes, but was interesting. During the time it lasted, the silence, following lengthy arguments, and the rustling of briefs and papers by a large number of gentlemen attired in bands and gowns was most marked. The cause for the sudden change of scene was the presence of a photographer. He appeared in Court to "take" the Judge and his surroundings. Nobody seemed to have any suspicion of what was going to happen until the said photographer approached the learned Registrar, and, in an under tone, hinted that it was a good light if his Honour would consent for a photograph to be taken. At that moment the learned Registrar in his wig would have made a fine picture. He smiled; so did one or two others who had heard the suggestion. With wonderful alacrity the Registrar mounted the seat under the Judge's bench, and silenced two advocates who were arguing over a case, while he made his Honour aware of the presence of the gentleman learned in the "black art." Then the Judge smiled. The photographer appeared as if he would like to smile too; but he glanced at the usher, and walked out of Court looking as serious as he could. But his request had been acquiesced in, and speedily he entered at another door with his apparatus. Immediately the secret was out, and everybody smiled. A light, nervous coughing was heard in various parts of the Court, and one or two persons discovered that their ties were a little out of order. All this took place while the photographer was busy fixing his camera. He was a careful man, and worked silently, and business was in no way interfered with until he intimated that he was "ready." After a little waiting, the signal was given, and his Honour was asked to kindly lean forward. At this point the Judge humorously intimated to the Court that a photographer was desirous to have a picture. Then everybody laughed again; but only a little, because the photographer is a dangerous man. If he had had a "shot" he would have been possessed of an interesting and amusing picture; but he waited a few seconds. The Judge, with his wonted pleasantry, consented to lean forward, remarking, "I think I had better look at Mr. Beal." "Mutual admiration, your Honour," replied Mr. Beal. To the discomforture of the photographer, there was a little more laughter. Eventually silence reigned, and no Judge of the High Court could have looked more serious than one or two of the gentlemen in bands and gowns who came within the focus of the camera. It seemd to be a great effort, but they did it very well. A few minutes later, in order to get a better picture, if possible, the photographer moved to another part of the Court, and was allowed to have a second "shot." Then he marched off triumphant.—*Devon and Exeter Gazette.*

AN ELECTION CARTOON.—COPYRIGHT PROCEEDINGS.—At the Worthing Petty Sessions last week, before Lieut.-Colonel Wisden (in the chair) and other magistrates, Edward Edwards, photographer, New-street, was summoned by E. Baruch Blaker for infringing a copyright of a photograph of a certain election cartoon, of which complainant claimed to be the proprieter, and asked that all negatives in the possession of defendant might be forfeited. Complaintant produced a letter written to him by Mr. E. Compton, who painted the election cartoon exhibited in the town on Thursday, giving him permission to photograph the cartoon and copyright it, Complainant sent a letter to Stationers' Hall, which was the same as sending the photograph or the actual painting, and he produced a receipt from Stationers' Hall, dated March 9. The Clerk (Mr. M. Goodman) advised the Bench that this was a fatal objection. The summons charged Mr. Edwards with infringing the copyright on the 7th inst., whereas the copyright was not actually obtained till the 9th. The Act said that no proprietor of any copyright should be entitled to the benefit of the Act until registration, and no action was sustainable or penalties recoverable in respect of anything done prior to registration. Mr. Blaker became owner of the copyright on the 7th, but in any event registration did not take place till the 8th, and he was not entitled to the protection of the Act until after registration. He would be entitled to protection in respect of anything that happened on the 9th and afterwards. It was a technicality, but he was bound to call the attention of the Bench to it. The Chairman: I gather you want to restrain Mr. Edwards from selling any photographs, notwithstanding they were taken before the registration? Complainant: He must not sell now I have the copyright. The Clerk said Mr. Blaker could decidedly take fresh proceedings. Mr. Blaker: I can obtain an injunction to prevent him selling copies from that negative. The Clerk: Certainly you can. Defendant wanted to know why the complainant should threaten him, and give him all this trouble before he had registered his photograph. The Clerk read the letter written to defendant, calling his attention to the infringement, and said a most offensive letter was written by Edwards in reply. It was decided by the Bench to dismiss the summons, the Chairman reminding defendant, however, that after this warning he would be liable to a penalty of 10*l.* for every copy of the photograph he sold. The ex-Mayor: Have not the historical personages there represented some rights under the Copyright Act? The Clerk: I should say the historical personages have pretty good rights against the painter. The ex-Mayor: So should I. The Chairman agreed that it might be possible for the people depicted in the cartoon to obtain an injunction to restrain the further sale of the photographs by any one. Mr. Edwards presented Colonel Wisden with a copy of the photograph in respect of which the dispute had arisen.—*Worthing Gazette.*

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 5102.—"Improvements in Electric Arc Lamps for Optical Lanterns, Projectors, and the like." A. BARRETT.—*Dated March*, 1895.

No. 5250.—"An Improved Method of Producing Photo-chromic Pictures." Professor E. STEBBING.—*Dated March*, 1895.

No. 5303.—"An Improvement connected with Photographic Cameras." Complete specification. HANS VON ELPONS.—*Dated March*, 1895.

No. 5346.—"Improved Photographic Camera." D. S. JONES and W. D. HUGHES.—*Dated March*, 1895.

No. 5370.—"Improved Photographic Stereoscope." H. S. GATES and T. T. TUTTLE.—*Dated March*, 1895.

No. 5483.—"An Improved Screen for Optical Projection Purposes." L. WRIGHT and J. ANDERTON.—*Dated March*, 1895.

No. 5558.—"Improvements in Photographic Cameras." A. B. MEES.—*Dated March*, 1895.

PATENTS COMPLETED.

IMPROVEMENTS IN MAGAZINE CAMERAS.

No. 2363. SAMUEL DICKINSON WILLIAMS, Moorlinch House, Clytha Park, Newport, Monmouthshire.—*January* 19, 1895.

I DIVIDE the camera at the centre with a partition, thus forming at the back a separate chamber, in which I stack in a horizontal plane the pack of plates or films with their sensitised faces downwards. In this partition, which serves the function of one fixed opaque backing for all the films or plates, is a slot or opening at the bottom, sufficient to allow the passage of a plate or film when drawn from underneath the pack, and a similar opening at the top to allow the passage of a plate or film back on to the top of the pack. The width of this slot or opening may be regulated by a screw device, to adapt the same to the varying thickness of plates or to the difference between plates and films. Opposite each slit or opening, and close thereto, I arrange a pair of rollers covered with rubber or other holding or elastic surface. Each set of such rollers is journaled in a suitable frame held together by transverse parallel rods, such frame being pivoted in a manner so as to enable it to be turned through an angle of 90° and back again. A central driving wheel at the side gears into toothed wheels on the nearest members of the top and bottom sets of rollers, imparting motion thereto. The roller frame of both sets has an extension arm, of fork or cam shape at the end, into which a pin on the driving wheel engages, with the result of turning the frame and the rollers from the vertical to the horizontal, a link lever connexion or cam motion also operated by the driving wheel restoring them at the proper moment to the horizontal. Jointed to the driving wheel, or worked by a pin or crank or cam shape projection thereon, is a lever at the side connecting by rods a tranverse bar with one or more suitable projections, to act as a selecting or separating device by giving the bottom plate a start out into the bottom set of rollers,

just at the moment they are set in motion and take hold of the plate or film, which is thereby rolled out from underneath the pack. The continued rotation of the driving wheel for a short space makes the pin first mentioned engage with the fork-shape arm or extension on the roller frame, and turn same up with the plate or film retained by its bottom edge therein into the vertical position, a similar pin has simultaneously engaged with the corresponding arm of the frame of the upper set of rollers, bringing them from the vertical to the horizontal, the general action of the machine enabling said rollers to receive the top edge of the plate or film, in which position the plate or film is retained for exposure. After exposure the continued motion of the driving wheel produces in the bottom set of rollers the release of the plate or film, and the return of the frame containing said rollers back through the angle of 90° to the vertical in readiness to receive the next plate or film from the bottom of the pack. Meantime a similar movement takes place with the top frame, which has the effect of turning the plate or film from the vertical to the horizontal, when the rollers deliver it on to the top of the pack or stack from the bottom of which it has been taken. The two sets of rollers in their respective frames, instead of turning back through an angle of 90° may be made to continue and go forward with the same result. Bare plates or films, *i.e.*, without any sheaths, or carriers or backing may be used, or films or plates may be used held in hollow frames; that is, consisting of a rim like a picture frame, but with a retaining flange or flanges, but without any opaque or other backing. The selecting or separating device already described I employ preferably with plates where there is a convenient thickness of material to deal with. For films I employ horizontal projections, which act as a spring foot, or presser, or support, or detent at the points in the compartment which would be coincident with the corners of the films which are packed on these projections in such a way that, starting with the first film, the same is set with the projection or foot engaging it at or near each of two of the corners thereof; the second film is then set on the first so that the corners of the two, instead of being coincident, overlap on two of the sides, thus forming an angular recess as between the edges of the two plates or films at those two corners which are furthest from each other. By this means two opposite sets of double corners are formed, and in the recess mentioned the spring foot operates by first engaging the corners of one film and then the corners of another, *i.e.*, the spring foot at each such corner, as it moves from engaging one film and thus releases or separates it, with the same motion engages with the second film, retaining it until it is moved back again on to the third film, when the second film goes free, and so on throughout a whole series. Instead of a spring foot with an alternate motion from side to side, circular or cam-shape discs with projecting arms having a continuous rotary motion may be used, but in either case the action of the above devices is arranged in conjunction with the general mechanism of the camera. The film on being so released drops on to a frame or slide with a cross bar bearing a knife-edge flange or other similar device, which engages the back edge of the film and draws it into the changing device.

An Improved Porous Saturator for Producing the "Etho-oxo" Limelight for Single, Biunial, or Triunial Optical or Magic Lanterns.

No. 2462. Thomas Timberlake, Queen-street Cycle Works, Maidenhead, Berkshire.—*January* 19, 1895.

An improved porous saturator to fit into an optical or magic lantern, for producing a brilliant illumination, by burning oxygen gas, saturated with ether, benzoline, gasoline, or other volatile hydro-carbon. The said saturator being L-shaped, and constructed with any suitable metal, having within itself a novel means of conveying and mixing the heavy saturated portion of oxygen with the pure oxygen by means of a special metal block containing the passages in connexion with, and conjunction to, a concentric mixing chamber, communicating with a special non-return valve, under which the gases thoroughly commingle, issuing thence to the nipples or burners, the said valve acting as check to, and preventing any flame from passing into the saturator, thereby ensuring perfect safety from the accidents hitherto attributable to the "flying back" of the mixed gases.

On the said saturator, when used for two or more lights, is placed above the said non-return valve, and in connexion with the passage to the burner or burners, a special revolving valve, acting as a stopcock with one light, a dissolver with two lights, and a regulator for one, two, or three lights, as the case may require.

If for more than one light, the said saturator has an improved connexion applied to the extension of the lights, whereby the necessary adjustments for the second and third lights are made by means of telescopic tubes attached to the holder of the revolving valve, and connecting the passages with the channels on the said valve, which is actuated by a connecting rod having a cranked handle at the back, acting in its turn upon a quadrant, with certain guides or stops made therein or fixed thereto for the purpose of indicating the number and conditions of lights in relation to the movements of the said cranked handle.

Improvements in or relating to Appliances for the Manufacture of Photographic Films.

No. 4627.—Thomas Henry Blair and The European Blair Camera Company, Limited, both of 9, Southampton-street, London, Middlesex.—*January* 19, 1895.

This invention relates to the apparatus employed in the manufacture or production of photographic films. Hitherto photographic films in rolls or long lengths have usually been manufactured by pouring the fluid material from a suitable hopper on to a table, or, in some more recent instances, applying it to the periphery of a revolving drum. As, however, this drum has to be of large diameter, in order to have sufficient distance from the place at which the fluid material of which the film is formed is applied to the drum and the point at which it is removed to allow the film to form and dry, only a limited space of the drum can be inspected without climbing. Also, since the solvents employed, if not of such a nature tha they will very rapidly evaporate, are apt to "run," owing to the coating surface being of cylindrical form instead of a level surface, some difficulty is experienced in commercially working such an apparatus.

In our invention we dispense with the drum, and we employ a belt or band carried upon suitable drums or pulleys at each end, and between which and the belt a suitable table or other drums or rollers are placed to maintain a level even surface, over which the belt or band moves, and upon which the fluid material is applied. After the belt has received the fluid material which forms the film, and has passed around the first drum, it hangs freely without support, the film having become set while the belt has been maintained in a level position, the length of belt being governed by the length of level surface required to set the fluid material sufficiently to prevent running when the band is changed into a cylindrical form by passing around the pulley the returning side of the belt carrying the film until sufficiently dry to be removed, which is preferably done as the belt turns around the second drum or pulley.

This band may be formed of any suitable material presenting a sufficiently smooth and even surface, and adapted to pass round the drums; conveniently we employ thin metal, say, for example, brass or bronze, connecting the ends in any suitable manner, so as to provide a perfectly smooth joint in order that the material may be worked continuously, although with a long band, even if the joint were not smooth, a considerable length of film without a break in it could be obtained.

The periphery of the pulleys or drums may be covered with fibre, rubber, or other suitable substance, to ensure the belt from slipping, or the inner side of the belt may be likewise covered with the same material for the same purpose; the belt may be connected at the sides with a gear chain travelling over cog wheels, which ensure a positive movement.

The drums may be driven by any suitable means.

The band and its appurtenances may be suitably cased in, and any necessary means provided to facilitate the drying of the film and to protect it from dust or damage.

An Improved Instrument for Calculating the Time of Photographic Exposures.

No. 8515. William Henry Phillips, 191, Stanhope-street, London, N.W. *January* 19, 1895.

My invention relates to that kind of photographic exposure meter in which an actinometer for finding the intensity of the light is not required to be used, the intensity of the light being taken from well-known tables compiled for this purpose, a copy of one of such tables being supplied with the instrument.

An instrument of this kind to be complete must embrace four factors: First, subject; second, plate; third, light; and, fourth, diaphragm.

In practice, photographic cameras are not usually provided with shutters capable of working at any required speed, or of giving any required rate of exposure, and it is usually to vary the size of the diaphragm in order to bring the length of exposure within the capacity of the shutter of the camera, and also to bring it to a suitable amount for the subject to be photographed. It is highly important, therefore, that a photographic exposure meter should show, when once set, and opposite the scale denoting the sizes of the diaphragms, the time of exposure suitable for each diaphragm simultaneously, and the photographer will then be able to choose such diaphragm as will require an exposure within the capacity of his shutter, and still at the same time a suitable one for the subject to be photographed; for instance, if moving objects are to be photographed, he must choose the shortest exposure at which his shutter can work, as indicated on the scale, and use the diaphragm of the size indicated for that exposure.

My invention consists of a slide rule, having upon it a date table for the intensity of light, and five different scales, namely, subject, plate, light, diaphragm, and time combined together in one instrument, and arranged in such a way that the time scale slides adjacent to the fixed diaphragm scale, and shows for each size of diaphragm simultaneously the time of exposure necessary. The other three scales may be arranged in any order possible without affecting the action of the instrument, any two of them being upon a movable slider, and the third one fixed, although I prefer to have the subject scale fixed, and the plate and light scales upon the movable slider; thus, although my instrument has upon it five different scales, yet there are only two movable slides, and therefore only two adjustments to make. The instrument is set by moving the slider until the number representing the speed of the plate is opposite the name of subject to be photographed, the time slide then being set so that a pointer which it carries is opposite the number on the first slider representing the intensity of the light. The time of exposure will be found simultaneously opposite each diaphragm on the scale. I thus arrange my instrument so that it not only indicates the necessary length of exposure, but also a suitable diaphragm to use.

Although I prefer to arrange the above scales in the form of a straight slide rule, yet another form of the instrument consists in arranging them as segments of circles, the scale of time being marked on the circumference of a central disc revolving on its axis and carrying a pointer, the other slider with the two scales upon it being a segment of a larger disc, and moving in a semicircular slot adjacent to the circumference of the central revolving disc, and the diaphragm scale and the other fixed scale occupying various segments of a larger fixed disc, and in positions adjacent to the scales to which they have reference, the setting of this form of the instrument being exactly as described for the previous one.

Improvements in Dark Slides or Plate-holders for Photographic Cameras.

No. 24,607. John Edward Thornton and Edgar Pickard, Altrincham, near Manchester, Chester.—*January* 19, 1895.

This invention relates to dark slides or plate-holders for the sensitive plates by which they are placed in and removed from photographic cameras, and is designed to render such holders more efficient in holding the plates, and the

operation of inserting the plates therein and withdrawing them therefrom more convenient.

It consists essentially in constructing that part of the frame into which the plate is inserted with a fixed ledge on every side between which the plate is placed, and fitting closely thereto with a rabbet or under cut recess at the top edge, and a movable strip or spring bar at the bottom to slide over the fixed ledge, to form a groove or recess at the bottom edge, a spring or springs being placed below the same, and with a spring or springs to press the plate outwards when released, and render it easy of being handled or taken hold of.

A Novel Stereoscopic Magic-lantern Apparatus.

No. 24,821. Willem Geldolph Grottendieck 26, Laan von Meerdervoort, The Hague, Holland.—*January* 26, 1895.

The present invention relates to a novel stereoscopic magic-lantern apparatus or arrangement of magic lanterns to show views stereoscopically, *i.e.*, by applying the idea on which stereoscopes are based to a number of magic lanterns, and advantageously with the aid of coloured glasses in said lanterns.

The accompanying drawing illustrates—diagrammatically in plan—an arrangement of this kind.

The pictures or views to be projected are made in a similar manner to those for stereoscopes or stereoscopic viewing apparatus; that is to say, they are representations or views of one and the same object from two different points.

The two pictures are inserted into the magic lanterns, each of which is or may be provided at its forward end with devices for allowing the light to issue coloured. The angles of projection of these two magic lanterns (*a*) (it is obvious that their number may if desired be increased for the purpose of heightening the effect) are adjusted with reference to one another in such a manner as to cause the two pictures to coincide together on the surface of projection (*b*). For colouring the light complementary colours are advantageously selected in such a manner that the pictures represented (which are observed through a special viewing device) shall appear as far as possible in their natural colours. The viewing device is advantageously made of glass, but may also be made of gelatine coloured liquid, or other similar materials or otherwise suitably arranged.

It is to be noted that the left-hand picture should be projected with the colour which is shown by the view apparatus that is in front of the left eye, and so on for the other eye.

By this means the eye of the observer receives a curious and realistic impression of the object represented.

The constructural arrangement of the whole apparatus is, of course, capable of the most varied execution; that is to say, the invention is capable of being carried into practice in a variety of ways.

Thus, for instance, the viewing device may consist of a simple pair of spectacles.

It may, however, also be that the viewing holes of a box or case enclosing the entire apparatus are so arranged that the observer on approaching the box can see nothing except the two coloured glasses through which it is intended he should look. The entire remaining portion of the apparatus can then be arranged in a suitable manner inside the box.

The claims are:—1. The employment of two or more magic lanterns arranged in combination, and acting in conjunction with stereoscopically arranged magic-lantern slides or views, to produce stereoscopic-like effects substantially in the manner hereinbefore set forth. 2. A stereoscopically acting magic-lantern apparatus arranged, combined, and acting substantially in the manner and for the purpose hereinbefore described, and illustrated in the drawings hereunto annexed.

Improvements in Apparatus for Developing, Fixing, and Toning Photographs.

No. 6866. E. F. Mackusick, 15, West 24th-street, in the City, County, and State of New York, United States of America.—*February* 2, 1895.

This invention is especially adapted to the developing, fixing, and toning of photographs that are printed upon a long sheet or strip of paper, which for convenience is wound up in the form of a roll, it being understood that the paper is first prepared with proper chemicals and then exposed under negatives to the action of light, after which the strip of paper is rolled up, and contains the latent or undeveloped pictures.

This part of the operation is to be performed in any suitable manner, and my present improvements relate especially to the apparatus that is used for developing, fixing, and toning the pictures, which operations are performed in a dark room until after the pictures have passed through the fixing solutions.

I provide a series of tanks for containing the various chemical solutions and water, and at the top edges of the tanks, and crossing the range, rollers are provided in adjustable bearings, and driven at a uniform speed by a shaft running along the range of tanks, and provided with gearing, such as screw pinions, acting upon gear wheels upon the respective rolls, so that these rolls are all driven at the same surface speed, and, to prevent the paper that passes over these rolls retaining bubbles of air between the wet paper and the rolls, such rolls are grooved to allow for the air to pass out, the grooves sometimes running longitudinally, sometimes circumferentially, and sometimes helically, or in opposite inclined directions, for acting upon the web in the proper manner as the web is passed over these rolls, and in lower portions of the tanks there are rolls, the axes of which are received into and guided by channel bars, affixed to the inner surfaces of the tanks, and preferably receiving slats of wood or similar devices for holding down the arbors of the tank rolls; and endless belts are provided, usually of metallic wires or strips, covered with indiarubber, and passing into grooves at the ends of the respective rolls, so that the belts go over the upper rolls down into the tanks and below the lower rolls, and so on throughout the whole series, and a cross bar is connected to these belts, and the advancing end of the strip of paper is connected to the cross bar, so that the belt, as it is moved progressively throughout the range of tanks, carries the advancing end of the strip of paper over the upper rolls and down into the slots below the lower rolls, and up again, until the strip of paper has passed all through the respective tanks, and the latent pictures have been developed, fixed, and toned, and the strip is passed off to a suitable dryer, usually upon an endless belt of muslin or similar material.

It is advantageous at one or more places to provide a sufficient distance between one tank and the next for the strip of paper to hang down in the form of a loop, and be distended by a roller lying in such loop, and a water pipe is provided over the roller and perforated, so that sprays of water are directed upon the paper to thoroughly wash the same at the desired places, and one of these sprinkling or washing devices is usually provided for acting upon the paper immediately before the strip is received upon the belt that conveys the same away to the drying chamber, and a "squeegee" acting upon the strip of paper adjacent to one of the belt rolls serves to remove surplus water.

A lead-lined trough is usually provided beneath the range of tanks for the washing water, and also for running off spent solutions, the tank being provided with stoppers in the bottom, by the withdrawal of which the contents may be discharged.

A Process for the Reproduction of Objects, either in Relief or in Intaglio, with the Aid of Photography.

No. 3121.—Mario Russo, 97, Via Pedacchia, Rome, and Giovanni Battista Zanardo, 154, Via Sicilia, Villa Ludovisi, Rome.—*February* 9, 1895.

This invention has reference to a process wherein the action of suitable light, such as solar light or electric light, on chemical preparations, is employed in the production in relief or in intaglio of objects of various kinds capable of being photographed, and whereby reliefs and intaglios can be produced whereof the various parts will be more or less prominent according to the relative prominence, or representation of prominence, of the corresponding parts in the originals, and quite irrespective of the colour or colours of the various parts of the originals.

In carrying out this process we first obtain a negative of the object to be reproduced in relief, and from this negative we make a transparent positive of approximately the same density. It is necessary that the negative be very clear and exact in all its details, and in it the more prominent parts be the better illuminated. The negative should also be strongly developed, but without having its transparency impaired.

Having obtained a suitable negative and positive, we proceed to the preparation of a sensitive plate, which is made in the following manner:—We first prepare sheets or plates of non-sensitised gelatine as follows: We take of white gelatine, 100 grammes, which we soften in 400 grammes of water, and afterwards dissolve in a water bath heated to a temperature not exceeding 45° Centigrade. To the solution we add thirty-five grammes of pure glycerine, and fifteen grammes of ammonia, and the whole stir gently, preferably with a glass rod. When this solution is nearly cool, but still capable of flowing, we pour it gently, so as to form a thickness of about five millimetres of the composition, over well-polished glasses, which are covered with talc and surrounded by a border or frame, and we allow the sheets thus formed to dry as rapidly as possible. When the sheets thus prepared are well dried, we detach them from the glasses in the form of sheets or plates of gelatine, and preserve them between sheets of paper. These plates thus prepared will keep indefinitely, and a stock of them may conveniently be prepared and kept ready for use.

When it is desired to prepare a relief we make a sensitised plate in the following manner:—We first prepare bichromated gelatine by heating and mixing in a water bath four grammes of very pure gelatine, 100 grammes of distilled water, and one gramme of bichromate of ammonia, and filter the resulting mixture. We then spread the bichromated gelatine thus prepared in an even layer over the surface of a finely-ground plate of glass on the ground side. By using ground glass the gelatine firmly adheres to the surface of the plate, and will not become detached when the plate is immersed in water for swelling, as would be the case if a polished surface were employed. We then place upon this layer very carefully one of the sheets of dry gelatine prepared as above mentioned, taking care that no air bubbles remain between the glass and the sheet of gelatine. This being done, we spread over the dry gelatine a coating of the bichromated gelatine, allowing it to flow over the sheet in such a manner as to form a perfectly level and smooth surface. We then allow it to dry in a place protected from light and dust. This operation should always be performed in a place from which natural light is excluded, or is only admitted through red or orange glass; or, if artificial light is used, a lamp or candle is employed, protected by red or orange glass, as is usual in a photographic dark room. The sensitive plate, which must be carefully kept shielded from light and dust, is now ready to receive the impression, which is effected in the following manner: We superimpose upon the sensitive plate thus prepared a negative and positive, produced as before mentioned, in such a way that the details shall almost, but not exactly, correspond or register. We then clamp the negative, positive, and sensitised plate together, and expose to the light. The following indicates the approximate duration of exposure:—Sun, three to four hours; diffused light, six to eight hours; electric light, five to six hours.

The purpose of placing the negative and positive slightly out of register is this: If a negative and a positive of substantially the same density be exactly superimposed one over the other, the result is that the transparent parts of the negative will be blocked by the opaque parts of the positive so as to present a practically even opaque appearance; but, if the position of one of the plates be shifted slightly so as to have the details of one slightly out of register with those of the other, it will be noticed that there is at once produced a relief effect, and it is this fact that we take advantage of. By using a negative and a positive of substantially the same density, the difference of colours is practically eliminated, because the colour effect of the negative almost counteracts the colour effect of the positive.

After the plate has been exposed as before stated, we proceed to the development, first allowing the sensitive gelatine plate to cool if it has been exposed to the sun. The developing is effected by immersing the plate in water and moving it frequently until it presents the desired relief. If the plate be

immersed for a comparatively short time, the relief will be slight; if it be immersed for a longer time, the relief produced will be greater, and we may take advantage of this fact to regulate the amount of relief according to the subject or the effect desired to be produced. When the desired relief has been obtained, we remove the plate from the water, and immerse it for several hours in a five per cent. solution of sulphate of iron or other hardening agent. We then remove it from this bath and thoroughly wash it, after which it is ready for use to produce the mould, from which reliefs may be produced by electrotyping, or by any other process, in the usual manner.

In cases where the larger part of the figure to be reproduced is of a uniform light colour—that is to say, where there are only one or more transparent spots in the negative which are to be rendered opaque, we have found it advantageous to only apply to the negative the parts of the positive corresponding to such portions of the negative as are to be rendered opaque.

Claims:—1. The herein-described process of reproducing objects in relief or in intaglio, whereby there is obtained the proper relative relief of the various parts of any subject, irrespective of its colour or colours, the same consisting in first superposing upon an ordinary negative a positive, or part of a positive, as described, so as to be slightly out of register, and in contact with a suitably prepared sensitive plate, then exposing the plate thus arranged to light, then subjecting said sensitive plate to a bath of water, substantially as described. 2. The process herein described of reproducing objects in relief or in intaglio, whereby there is obtained the proper relative relief to the various parts of any subject, irrespective of its colour or colours, the same consisting in the first superposing upon an ordinary negative a positive, or part of a positive, as described, so as to be slightly out of register, and in contact with a suitably prepared sensitive plate, then exposing the plate thus arranged to light, and then subjecting said sensitive plate to a bath of water, and then to a hardening bath, substantially as set forth. 3. The process herein described of reproducing objects in relief or in intaglio, whereby there is obtained the proper relative relief to the various parts of any subject, irrespective of its colour or colours, the same consisting in first superimposing upon an ordinary negative a positive, or part of a positive, as described, so as to be slightly out of register, and in contact with a suitably prepared sensitive plate, then exposing the plate thus arranged to light, then subjecting said sensitive plate to a bath of water, and then to a hardening bath, and then making from the said plate a mould of plastic material, substantially as set forth. 4. The process herein described of reproducing objects in relief or in intaglio, whereby there is obtained the proper relative relief of the various parts of any subject, irrespective of its colour or colours, the same consisting in first superimposing upon an ordinary negative a positive, or part of a positive, as described, so as to be slightly out of register, and in contact with a suitably prepared sensitive plate, then exposing the plate thus arranged to light, then subjecting said sensitive plate to a bath of water, then to a hardening bath, then making from the said plate a mould of plastic material, and finally making a relief from said mould, substantially as set forth. 5. The process herein described of preparing sensitive plates for use in the production of objects in relief or in intaglio, the same consisting in first applying to the ground surface of a glass plate a coating of bichromated gelatine, prepared as explained, then applying to the surface thus coated a layer or sheet of dry gelatine, prepared as explained, and finally spreading over the surface of the dry gelatine layer a coating of the bichromated gelatine, substantially as set forth. 6. In a process of reproducing objects in relief or intaglio, the sub-process, which consists in superimposing a negative upon a positive in such a manner that the details are slightly out of register, and then submitting a sensitive plate to the action of light through the so-arranged positive and negative, substantially as described.

Improvements in Photographic Camera Apparatus.

No. 6868. George Francis Horne, 21, St. John's-square, Clerkenwell, London.—*February* 9, 1895.

The invention relates to photographic cameras, and is designed to facilitate their use and the closing and opening of the parts.

In carrying out my invention, I form the folding sides, bottom, and top of the dark chamber of the camera of sufficiently strong but flexible material, capable of folding, or extension, into a light-tight chamber at will, and the extended walls thereof are retained at their full extent by means of pairs of articulated arms, or rigid leaves, hinged to the front and back framework and to each other, so that the folding of the sides is followed by the folding of these arms.

These hinged arms can be straightened out and passed a little beyond, but only a little, when they are stopped by a projection on one or both coming against its fellow arm, so as to prevent the bend or elbow protruding through the side of the chamber.

The shutter to this light-tight chamber is hinged or articulated to the framework or front wall with spring pressure, having a constant tendency to close it. This cover, shutter, or flap, has a connexion, say, of sheet indiarubber, or other convenient material, which is attached to a vessel of like or other convenient elastic material, air-tight and extensible, by means of a flexible or other pipe passing through the intervening wall of the chamber when the shutter is applied inside, and the inflation may be effected by compression of the usual or other convenient pneumatic ball, or equivalent forcing means operated by the hand or otherwise. The inflation of the vessel causes it to assume a projecting position, and the lifting or removal of the shutter, whilst its deflation and collapse allows the shutter to fall or close the lens aperture.

The lenses I sometimes, for lightness and cheapness, mount in wood cylinders, which may be screwed into correspondingly threaded wood casings, with facility for focal adjustment.

Claims:—1. The combination of the front and back frames and limp or flexible sides of a collapsible camera for photographic use with folding, distending, and connecting hinged arms so as to dispense with the aid of spiral or other springs, as set forth and shown by the drawings. 2. The construction and arrangement of parts of apparatus for operating a photographic camera shutter pneumatically, substantially as set forth. 3. The construction or arrangement in combination of parts of a collapsible camera for photographic use with pneumatically operated shutter apparatus, substantially as set forth.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

March.	Name of Society.	Subject.
25–30	Brixton and Clapham	Fifth Annual Exhibition.
25.....	Camera Club	Description and Demonstration of *Mr. Warnerke's Half-tone Relief Process.* Leon Warnerke.
25.....	Lantern Society	
25.....	North Middlesex	Demonstration on *The Speed of a Plate.* R. Child Bayley.
25.....	Putney	
25.....	Richmond	*Home-made Apparatus.* H. Bickerton.
26.....	Birmingham Photo. Society ..	
26.....	Bournemouth	*Photographic Chemistry.* William Jones.
26.....	Exeter	*Photo-micrography.* Messrs. Huggins and Cheese.
26.....	Hackney	*The Lakes of Northern Italy.* J. A. Sinclair.
26.....	Lancaster	
26.....	Leith	
26	Munster	Prize Slides.
26.....	Newcastle-on-Tyne & N. Counties	
26.....	Paisley	
26.....	Rochester	
26.....	Royal Photographic Society ..	*The Evolution of Photographic Objectives*, with an Exhibition.—Demonstration of *The Advantages of the Nicol Prism in Photographing Oil Paintings, Clouds, &c.* Birt Acres.
26.....	Warrington	
27.....	Bath	
27.....	Burnley	
27.....	Croydon Camera Club	Last Lantern Show of the Season.
27.....	Leytonstone	
27.....	Midland	Members' Lantern Night.
27.....	Photographic Club	*The Far East.* R. P. Drage.
27.....	Southport	Slide-making.
27.....	Stockport	
28.....	Camera Club	*The Illustration of Books.* Joseph Pennell.
28.....	Dublin Y.M.C.A. Camera Club	Annual Prize Competition.
28.....	Ealing	Technical Lecture by E. J. Wall.
28.....	Glossop Dale	
28.....	Halifax Photo. Club	
28.....	Hull	
28.....	Ireland	Demonstration: *Warm Tones in Bromide Printing.—Views in Switzerland.* R. M. Inglis.
28.....	Leigh	Lantern Evening, Members' Slides.
28	Liverpool Amateur	*A Tour in the Highlands.* William Harvey.
28.....	London and Provincial	Open Evening.
28.....	Oldham	
28	West London	*Jottings.* Leslie Selby.
28.....	Woolwich Photo. Society	Demonstration by the Autotype Company.
29	Ashton-under-Lyne	Annual Social Meeting.
29	Cardiff	
29.....	Croydon Microscopical	
29.....	Halifax Camera Club	
29.....	Holborn	
29.....	Maidstone	
29.....	Swansea	
30.....	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

March 14,—Mr. G. W. Austin in the chair.

This was a Lantern Night. Mr. E. W. Parfitt showed a series of slides of the recent eclipse of the moon, taken with a reflector telescope and a Barlow lens. The exposures given were about one second. The size of the image obtained was nine-sixteenths of an inch.

Mr. T. E. Freshwater showed slides of snow crystals photographed on a conservatory window.

The Chairman and Mr. Chapman showed slides of clouds, seaside subjects, Devonshire and Yorkshire views.

Mr. Snowden Ward showed a number of slides of Irish scenery taken during the late Dublin Convention, following them with a series illustrative of scenes in and about Stratford-on-Avon associated with Shakespeare. This comprised views of Anne Hathaway's cottage, Mary Arden's cottage, the Grammar School, Charlecote Park, and other interesting Shakespearian spots, interiors, relics, portraits, churches, monuments, &c. Mr. Snowden Ward gave a brief but interesting little historical talk on the subject of the views, which were the work of Mrs. Catherine Weed Ward, to whom, at the conclusion, a cordial vote of thanks was passed for kindly sending the slides that evening at short notice.

PHOTOGRAPHIC CLUB.

March 13,—Mr. F. A. Bridge in the chair.

Mr. Welford presented his usual monthly donation of forty English and foreign photographic magazines, for which he was unanimously thanked.

Arising out of the minutes, Mr. Nesbit asked why a watch dial should be used in the testing of a lens? In his opinion it was no guide at all as to the quality of a lens.

Mr. Haes said that it had been laid down by eminent authorities that it was one of the best tests.

Mr. Sinclair pointed out that the camera would be moved so that the dial would be successively in all corners and all parts of the plate.

Mr. Tottem said that Mr. Haes simply tested by focussing, and not by actually photographing the dial.

Referring to the falling off of the illumination at the edges of plates, Mr. FRY said that a good test was to put into the enlarging camera an unexposed plate upon which a series of lines had been scored with a knife. Then, if this was projected upon a clean piece of paper, the falling off of illumination was more easily detected.

Mr. Fry passed round three prints :—First, on the smooth platino-bromide paper given by Elliott & Son last week; second, on the rough; third, on platinotype paper.

Mr. EDWARDS asked if Mr. Fry preferred metol to ferrous oxalate for developing bromide paper? Could he obtain better results?

Mr. FRY said that he could not obtain better results, but the same result could be more easily obtained.

Mr. Tottem showed an illustration in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC of ten years ago on Alpha paper, which was now quite yellow.

Mr. BELLOT said that it was only a few days since that he destroyed one of the same illustration simply because it had practically disappeared.

Mr. Bulbeck passed round the specimen oleograph issued by Messrs. Fuerst in their competition recently, also specimen prints from negatives on various plates corrected and uncorrected. Mr. Bulbeck also showed a number of collotypes of the Passion Play at Ober-Ammergau.

A vote of thanks was passed to Mr. Bridgeman for his trouble in bringing down his stereoscope and fifty glass slides, also an album of fifty 10×12 enlargements, all of which were well examined and voted excellent. The stereoscopic slides and enlargements were Mr. Bridge's work.

Mr. Welford showed a series of slides from negatives taken in Holland, Mr. Wilkes a series of snap-shots.

A series by Mr. Birt Acres, *Reminiscences of the Ice-bound Thames*, was also shown.

MANCHESTER PHOTOGRAPHIC SOCIETY.

MARCH 14,—the President (Mr. H. M. Whitefield) in the chair.

Mr. F. W. ANDREW introduced the subject of the evening, *Enlarging*, by exhibiting Hume's cantilever enlarging apparatus, and explained his method of working. The light is derived from an oil lamp; the time of exposure ranges from seven to fifteen minutes.

The HON. SECRETARY, Mr. A. E. Casson, next exhibited an apparatus for enlarging and reducing, which he had himself made, having been coached in its structure by the President. It was fitted with the incandescent gas light, and appeared to have all the essentials of a good workable instrument, the outcome of experience gained by practical work. The condenser is nine inches in diameter, and, in reducing from half-plate to lantern size, the exposure ranges from two to four minutes with this method of illumination.

Mr. F. EDWARDS exposed and successfully developed an enlarged photograph from half-plate to fifteen by twelve size, by means of the cantilever apparatus. The following notes were given by Mr. Edwards (who has had considerable experience in enlarging) :—"My experience is all with the Ilford rapid paper; I find the developer ought to be modified to suit the negative and the result required. A thin negative, full of detail, gives the best result. Developer, ferrous oxalate, five to one; or, for hard negatives, six or eight to one, adding some old developer along with the new; for thin negatives about equal quantities; for a dense, harsh negative, add very little old developer. It is an important point to watch and time the first appearance of the image with a normal developer—equal quantities of old and new solutions. About one minute would be the correct time for the appearance of the image; if much sooner, expect over-exposure, and pour off the developer, and again flood with old developer only. If the image is longer in coming out—say, takes more than a minute and a half—then add more new developer, about half as much new; if much under-exposed, finish with all new developer. Much can be done by local development with a brush, first flooding the print with acid solution—acetic acid, one drachm; water, thirty ounces—to stop development, and afterwards applying with the brush, locally, fresh developer."

The interest of the meeting was maintained until a late hour, two other communications being left over for a future meeting.

Hackney Photographic Society.—March 12.—Mr. R. Beckett presiding. Mr. Roberts showed enlargements on Alpha and bromide papers produced by means of the incandescent gas light. He found the latter to greatly lessen the necessary exposure. Mr. GRANT spoke of having had similar experience.

North Middlesex Photographic Society.—March 4.—Mr. BIRT ACRES gave a lecture on the *Polarisation of Light in Photography*. Mr. Acres showed a number of experiments with apparatus mostly of his own manufacture. The use of the Nicol prism was explained, and its value in photographing clouds was clearly demonstrated by the aid of a tank of water placed in front of the lantern. A very pleasing experiment was shown by Mr. Acres, the production of colours from the three primary colours, red, green, and violet; with these the lecturer produced yellow, orange, blue, &c. The lecturer also demonstrated the use of screens in orthochromatic work. At the conclusion, a hearty vote of thanks was passed to Mr. Birt Acres for his most successful lecture.

ON Monday, March 11, before a large audience, Mr. RAMSAY, of the Eastman Company, gave a demonstration upon *Platinum-toned Solio Paper*. After explaining the merits of this particular form of toning, the demonstrator toned a considerable number of prints, carefully explaining the particulars whilst toning and fixing was proceeding, the resulting tones being a brownish-purple and of very pleasing appearance. In answer to a query as to the fading, Mr. Ramsay said that, as far as they had been able to ascertain, the prints toned by platinum were quite as permanent as prints toned with gold. At the conclusion, the lecturer came in for a warm vote of thanks.

Woodford Photographic Society.—March 7, Mr. E. B. Caird in the chair. —A short discussion took place upon backing plates. Mr. Marriage submitted wo specimens of backing, and Mr. Malby also showed some plates backed according to Mr. Teape's formula slightly modified. A sample of the backing was also shown. Mr. Malby submitted for the opinion of the members present four plates and prints (flower studies of the same plant). The exposures were made on two different occasions, two Ilford isochromatic and two Edwards's isochromatic plates with various screens being used. The majority of votes were in favour of Edwards's isochromatic plates with Burchett screen. Notice of alteration of Rule 7 reducing subscription was given by Mr. Emler.

Bolton Photographic Society.—March 6.—Mr. Brown, of the Zenotype Company, attended, and gave a practical demonstration of the process. Various good tones were well produced, a dark green with the aid of "Zenochrome" being admired. The Thornton-Pickard patent plate-holder was exhibited, and very favourably commented on.

Bradford Photographic Society.—March 14.—Mr. F. O. BYNOE lectured on *The Modern Hand Camera and its Capabilities*. The President (Mr. Alex. Keighley) occupied the chair, and the Lecturer expatiated upon the advantages of celluloid films over glass plates on account of their lightness and less liability of fracture, and their greater portability. He deprecated the use of roll-holders as a changing device and of sheaths and carriers. He also spoke of the difficulties encountered in producing a satisfactory automatic changing device for cut films without the use of sheaths, and by the aid of the lantern and mechanical slide illustrated the Frena system. He strongly advocated the use with hand cameras of the swing back and a fixed focus lens combined with magnifiers for near objects, and, with the aid of several diagrams, confirmed his points. The lecture was brought to a close by a series of admirable views taken in all parts of the world by the Frena hand camera. Mechanical and other slides illustrating the lecture were shown by limelight lantern, manipulated by Mr. R. J. Appleton, of Manningham-lane. A hearty vote of thanks was accorded to Mr. Bynoe at the close.

Derby Photographic Society.—March 9, an Exhibition of Photographs.—The last Exhibition of the kind was held at the School of Art a couple of years ago, and was largely patronised. Amongst those who contributed are Mr. C. J. Bennett, Mr. C. Bourdin, Mr. G. W. Rich, Mrs. F. H. Gandy, Mr. E. Fearn, Mr. W. R. Bland, Mr. Geo. Walker (vice-president of the Society), Mr. G. Moore, Mr. G. Cornwell, Mr. T. A. Scotton (photographer to the Midland Railway Company), Mr. F. C. Sidley, Mrs. Highton, Mr. J. Fleet, Mr. F. Bassano, Mr. R. Wilkin, Mr. J. Barlow, Mr. G. H. Crundy, Mr. W. Tolley, Mr. A. W. Stone, Mr. G. W. Matthew, Mr. R. Woods, &c. Mr. Bourdin had some very pretty French views, and one real novelty showed the action of the recent severe frost upon a bottle of Hunyadi Janos water. The cork had been forced out, and was frozen to a thick stick of ice, which projected from the mouth of the bottle. Mr. Bland exhibited some capital specimens of a new process—cold-bath platinotype prints—and Mr. Bennett and Mr. Cornwell had some very beautiful enlargements. Mr. Scotton's photographs were of charming bits of scenery, and Mr. Fleet and Mr. Fearn were the bronze medal winners of the outdoor competition—1894. A lantern Exhibition on Saturday evening was a marked success, and was followed by a second on Wednesday. Each evening during the week the photographs were on view, and there was a smoking concert as a wind-up to the Exhibition.

Leicester and Leicestershire Photographic Society.—March 14, Mr. Councillor Squire (President) in the chair.—The PRESIDENT read the awards of the Judges of the prints and lantern slides sent in by the members in the late competition, which were as follows :—Whole-plate and over, no class. Half-plate, silver medal, Mr. J. Porritt; bronze medal, Mr. H. Pickering. Quarter-plate, silver medal, Mr. Howard; bronze medal, Mr. Murray. Snap-shots, no class, Lantern Slides, silver medal, Mr. George Bankart; bronze medal, Mr. Cowdell. Mr. E. STUART NORFOLK, gave a demonstration on *Enlarging*, with the Hume cantilever lantern, which was a great success, the enlargement from quarter-plate to 10×8 being sharp and crisp and the exposure well timed. A hearty vote of thanks was passed to Mr. Norfolk.

Llandudno Scientific and Literary Society.—March 15.—A lecture was delivered by Mr. W. A. WHISTON on *Photo-chromotypy*. The lecturer first explained that photo-chromotypy did not treat of photography in natural colours. That was but a partly accomplished fact, Lippmann having obtained a copy of the spectrum, as also of a garden and a laboratory, in natural colours, which were fixed and permanent; but the subject of the lecture dealt with the production of sets of half-tone blocks by means of photography, which should be printed in such colours and in such a manner as to represent vividly the colours of nature. Photo-chromotypy was an assimilation of various processes, and its successful issue was due solely to the experiments of Mr. F. E. Ives, of Philadelphia. The commercial advantages of the process as an economical method of natural colour printing was shown, and the lecturer proceeded to explain, first, the principles of letterpress printing, and then of negative-making. Lantern slides and various objects demonstrated the working of these, after which Mr. Whiston explained the beautiful property of bichromated gelatine or fish glue, whereby the portions exposed to light were rendered insoluble in water, the unexposed portions washing away, or, in the case of the gelatine, rendered capable of absorbing moisture, and so resisting fatty inks. The printing from a "line" negative—black and white—was illustrated, as also the burning in of the altered emulsion, forming a protective enamel. Samples in this condition were exhibited, showing the enamel *in relief*, but not sufficiently so for printing; thus the parts whence the emulsion had been washed down to the bare zinc were to be further deepened by etching in acid. Slight reference was made to collotype, but time precluded any detailed explanation. The production of the "screen-negative" was next dealt with. A diagonally ruled cross-line screen, having 125 lines to the inch, was put into the lantern, and the production of rectangular and circular dots illustrated by several enlarged illustrations which the lecturer had magnified 600 times by means of photo-micrography. The peculiar action of light through the screen was a subject never yet explained, though many theories had been advanced, favour being given to diffraction. Mr. Whiston suggested that he favoured a theory of vibration, which theory he had recently communicated to a scientific journal, and a response to which he anticipated with interest. Again explaining the printing on zinc or copper, and so completing an explanation of the production of half-tone blocks

the lecturer ventured to predict that the introduction of half-tone work was the death-knell to silver printing, and that soon, instead of paying 30*s.* for a dozen cabinet silver prints, we should pay a sovereign to the photographer for the block and get our photographs printed by letterpress at a trifle more than the price of a common handbill, plus the price of the better paper. The production of portraits was illustrated, several beauties being thrown on the screen. Some striking chromotypes, kindly lent by Messrs. Hare & Co., were exhibited and admired. The next point was the theory of colour. By some beautiful experiments and an ingenious slide of his own the lecturer illustrated the undulatory theory of light and the division into primary and secondary colours. A brilliant spectrum was produced by the limelight, and by means of coloured screen it was demonstrated that the spectrum consists mainly of three colours, blue-violet, green, and red, and, if three photographs be taken from nature, interposing these three screens in turn, the resultants would be negatives representing these three colours, from the mixture of which all other colours are produced. Some pretty experiments illustrating popular delusions as to the compositions of colours were followed by slides showing the theories of refraction and dispersion. The principle of complementary colours was enforced by requesting the audience to gaze for 30 seconds at a red spot on a screen. Then, by suddenly withdrawing the colour and lighting up the whole screen, a greenish-blue spot of the same size was plainly visible. Mr. Whiston then showed that a block made by means of a certain coloured screen negative should be printed in the complementary colour; hence the violet-blue screen gave the block to be printed in yellow, the green in red, and the red screen in blue; thus these three printings gave natural colour values, of which many specimens were shown. Prints illustrating the difference in a set of blocks were handed round, being impressions from blocks kindly lent by Mr. F. C. Clarkson, of Fenchurch-avenue, London. Length of exposure was the only thing that prevented the production of portraits by this method. Reference was made to the photo-chromoscope and other applications of the process, and plates were exhibited illustrating the transfer of ordinary photographs to earthenware, the development of the process being heartily cheered by the audience. Mr. Whiston modestly claimed that this invention was his own, and we understand that he has taken out a patent for its protection. After moralising on the fascination of photography and the study of the kindred science of light, the lecturer resumed his seat amidst hearty applause.

Dundee and East of Scotland Photographic Association.—March 11, Mr. Andrew Stewart (President) in the chair.—Three new members were admitted. The Society resolved to secure club-rooms at 87, High-street. The premises consist of two rooms, one of which is to be used as a workroom for enlarging and other photographic purposes, and the other as a sitting-room, where the photographic papers and journals may be read. The prizes in the President's competition for the best six snap-shot lantern slides were awarded as follows:—Mr. David Ireland (first prize); Mr. Peter Feathers (second); and Mr. James R. Stewart (third). The winners in the lantern-slide competition for six slides in any subject, were:—First prize, Mr. William Salmond; second, Mr. David Ireland; third, Mr. W. Bertie.

Kilmarnock and Ayrshire Photographic Society.—March 16, Mr. J. Mack Wilson presiding.—Mr. Smith, of the firm of Messrs. Smith & Lee, process engravers, Dixon-street, Glasgow, gave a demonstration on *The Half-tone Process*. The examples shown abundantly proved the excellence of the workmanship performed by this firm. At the close there was a limelight exhibition of members' slides.

Ulster Amateur Photographic Society.—March 6.—A very successful demonstration, under the auspices of this Society, was given in the Museum, College-square North, Belfast, by Mr. A. C. Baldwin, of the Eastman Photographic Materials Company, Limited, London. The President (Mr. W. Gray, M.R.I.A.) occupied the chair, and the attendance, which included several of the leading professionals of the city, was both large and appreciative. Before proceeding with the practical part of the demonstration, Mr. Baldwin gave a lucid description of the Kodak and Kodet cameras. He handed round for inspection a large number of prints from film negatives taken with the Kodak, and also a number of contact prints and enlargements on Nikko, bromide, and platino-bromide papers, which were very much admired, especially those on the last-mentioned paper, for their richness and soft appearance. Nikko paper, he said, was introduced to satisfy the desire of those who prefer the glossy surface to the matt. It can be used for enlarging or for printing by contact from negatives. The room was then darkened, and a large number of prints, made by contact or enlargement, were successfully developed by Mr. Baldwin, who was ably assisted by Mr. Allison, of the Vienna Photo-Art Company. The exposures of these prints were made at the Company's works at Harrow.

Photographic Society of Japan.—January 29, Mr. K. Ogawa in the chair.—Mr. K. Nakahara showed a cyanotype print, much superior to anything of the kind generally seen. It was from a mechanical drawing, line sectioned, and showed deep, black, clear lines on a perfectly white ground. Mr. Nakahara described the precautions necessary to get this effect, and the difficulties that were likely to be met with. Briefly put, the process is as follows: A paper highly sized should be used. Small sheets can easily be worked, but the difficulty increases greatly with dimensions, a sheet about 20×18 being the largest that he had, so far, been able successfully to manipulate. Want of equality in the depth of the lines, and staining in the whites are the defects difficult to overcome. All manipulations are with a view to avoid these. The sensitising solution is as follows: Gum arabic, 15 grammes; water, 110 c.c.; tartaric acid, 2 grammes; chloride of sodium (common salt), 9 grammes; sulphate of iron, 10 grammes; iron perchloride, 15 grammes. In mixing the solution, the gum arabic is first dissolved in the water by the aid of heat, and the other salts are added whilst the solution is still warm. The solution is spread over the surface of the paper with a sponge, and, after allowing a little time for it to penetrate the surface, all superfluous moisture is removed, using the sponge again, well wrung out. If this precaution be not attended to, the depth of the lines is not equal. The paper is then dried as quickly as possible. If the drying is not rapid, the whites stain. Exposure is somewhat longer than would be needed with sensitised albumenised paper. The colour of the sensitised paper is yellow. During exposure, all but the lines turns to white. Development is by a plain, aqueous solution of gallic acid, the strength of which is not important. Care must be taken not to leave the print too long in the developer, otherwise staining will result. After development, the print is rapidly washed, when superfluous moisture is carefully sponged off the surface. If this precaution be not observed, inequality in the depth of the lines will result. The success of the process would appear greatly to depend on the sponging off of superfluous sensitising solution and water from the surface of the paper, and on quick drying after sensitising. Mr. R. Konishi showed a moderate-power tele-photographic lens, consisting of a Dallmeyer rapid rectilinear of eight and a quarter inches focus, with a negative element of four inches focus by the same maker. The rapid rectilinear was fitted with a pair of the new Burchett colour screens—one green, the other yellow. These are used for getting orthochromatic effects, which it is claimed can be got, with their aid, even on ordinary plates.

FORTHCOMING EXHIBITION.

1895.		
March 25-30	.....*Brixton and Clapham Camera Club.	F. W. Levett, 11, Corrance-road, Brixton, S.W.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

THE AMMONIUM-CARBONATE DEVELOPER.

To the Editor.

Sir,—I observed in last Friday's number of the Journal an interesting letter from Mr. W. B. Bolton in criticism of my recent article. Mr. Bolton's position as an authority on the subject of photography is such that I should be exceedingly unwilling to dissent from him on this or any other technical matter, were it not that I have sought to establish my few contentions on a basis which is purely experimental.

But, after all, as I find nothing in his letter to which I can justly take exception on theoretical grounds, I am inclined to think that the point on which we differ is one which owes its origin to individual preference.

The advantages of the ammonium-carbonate developer will, of course, be most appreciated by those who, like myself, are in favour of slow development, and who have found the ordinary developers (even when employed along with a bromide restrainer) too energetic to permit of their obtaining anything like latitude of exposure.

Mr. Bolton expresses his preference for an energetic form of developer (he instances pyro and ammonia), and this, unless I misinterpret him, seems to show that he for one is an advocate for rapidity in development.

I may say that I have employed the pyro and ammonia developer in my daily practice for upwards of fourteen years, so that, at any rate, I cannot be said to be blind to its good qualities. Even now I am conservative enough to retain it in all cases where there is nothing to be gained by employing the carbonate developer.

The claims of the latter, as I have endeavoured to show, must rest not so much upon its merits as a developer *per se*, as upon the power which, when employed in conjunction with a restrainer, it gives us of making wide variations in the duration of the exposure. When I say wide variations I do not mean that we are intentionally to commit a photographic sin and over-expose. What I do mean is, that we are at liberty to give an exposure which, though the correct one for this developer, would be actually an over-exposure were we to employ in its stead a rapid developer, such as pyro and ammonia.

In regard to the alleged instability of the sesquicarbonate, I must say that, personally, I have found it stable enough in the crystalline state, which is the state in which it should be procured and preserved for photographic purposes. In solution it decomposes slowly, especially when exposed to the air, which is one reason out of several which might be given for our not preparing our solutions until they are wanted.

The fact that this compound is a sesquicarbonate does not, I think, wholly account for its extremely slow action in development under the conditions to which I have made reference, for I find that, in the absence of a bromide, the development proceeds with comparative rapidity, so rapidly indeed that it is usually completed in about a third or a fourth of the time which would have been required had the additional restrainer been present. There can, however, be no doubt that the presence of the bicarbonate does exercise considerable influence in retarding the action.

What Mr. Bolton says of the other alkaline sesquicarbonates deserves to be more widely known. If he could be induced to favour us with a paper on the subject, it would, I am sure, be very acceptable to the readers of the Journal.—I am, yours, &c.,

March 14, 1895. Matthew Wilson.

STUDIO-HEATING.

To the EDITOR.

SIR,—The accompanying photograph of a "burst" will give you the result of my experience of studio heating. It is of the high-pressure system, and had only been in use for one week, when, on the morning of the 9th ult., as a lad was renewing the fire, bang went the coil and furnace, blowing parts of it a considerable distance, and the lad a distance of twenty feet. He most miraculously escaped with a slight scalding, a few bruises, and the shock, while other three of us had just left the spot some two or three minutes previously. Some or all of us three must have been killed or seriously mutilated, and after such a narrow escape I do not feel justified in persevering with this system; hence my query to you of last week as to a practical stove for heating our glass room of $36 \times 18 \times 17\frac{1}{2}$ feet high at ridge.

What I cannot understand is that, although the fire of furnace was not out day or night since it was lit a week before, yet the makers (an Edinburgh firm) affirm that nothing but freezing could have made such a smash. Now, Mr. Evans states in last week's JOURNAL that his fire *had* been out, but "even then the pipes did not cool." There are 300 feet of piping in mine, and possibly the coil and furnace were scarcely sufficient to create a heat in the return pipe able to resist a severe frost; and, as the engineers, trying their best, could only get the thermometer up to 55° (although 60° was that agreed upon by the makers), I am the more like being convinced that this is the explanation. I read with interest, and am obliged for, Mr. Evans's experience, and shall feel benefited with that of others, as I am undecided how to heat the glass and dark rooms. After my experience with the high-pressure, I cannot have much favour for it, especially as there are such unthought-of dangers with the ordinary attendant, who, seeing that the fire was never out, might not be expected to examine for ice. In at least one church here, with a similar system, the fire was completely out every night during the severe frost with no ill effect.—I am, yours, &c.,

R. STEWART.

Photographic Studio, 137, High-street, Elgin, N.B., March 12, 1895.

CERAMIC ENAMELS.

To the EDITOR.

SIR,—My attention has been called to some remarks made at the London and Provincial Photographic Association on March 7, by Mr. A. Haddon, on an article on the above-named subject in *Photography Annual*, 1894, written by me, and calling upon me for an explanation as to the similarity of my article with that on the same subject by Mr. N. K. Cherrill in the *Year Book* for 1886. The explanation, sir, is simple. Having previously, when answering a question in *Photography*, vol. iii. p. 270, acknowledged my indebtedness to Mr. Nelson Cherrill, I did not consider it absolutely necessary to do so again in an article merely descriptive of the method of making an enamel. At the same time, no doubt it would have been better to mention Mr. Cherrill's name. With regard to Mr. Haddon's remark that any one would infer from my article that I was the author of the process, I can only consider such an idea far-fetched and absurd.

Surely, sir, when my second paragraph commences, "There are two processes in use for the purpose," &c., there is no likelihood of any one thinking that I invented the process. Similarly, no one would be so absurd as to think, on reading Mr. Haddon's paper on *Enamelled Tablets for Ceramic Photographs*, that he was the inventor of a process which is centuries old, and working particulars of which I find in a book dated 1824. I may state that I obtained my information of Mr. Cherrill's method from neither of the works mentioned by Mr. Haddon, but from Spon's *Workshop Receipts*.—I am, yours, &c.,

G. ARDASEER.

Richmond, Surrey, March 18, 1895.

PORTRAITURE FOR AMATEURS.

To the EDITOR.

SIR,—I have often noticed in your JOURNAL advice given to amateurs, but I never saw a more extraordinary article than that which appeared in this week's issue. Mr. Arthur Hands advises them to go in for portraiture; well, all I can say is, let them go in for it, and, if they do not succeed better in this than they have in landscapes, we professionals have not much to fear from them.

As however, I think this advice is likely to cause a still further extension of the amateur's already inflated opinions of his powers, I would ask Mr. Hands and others, when they address the amateur to tell him of a few of his faults, and not pander to the vanities of the enemies of his craft.—I am, yours, &c.,

TONING PRO.

March 19, 1895.

PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—I have observed in the photographic papers, both by remarks made at meetings and in correspondence, that credit is scarcely given to this Society for work which has actually been done. It is, nevertheless, a fact that we have not only undertaken successfully a large amount of general work in connexion with copyright questions on behalf of members, but we have been instrumental in obtaining large sums of money for them from papers and journals who have pirated their copyrights, and this without resorting to the law courts.

The following gentlemen can testify to the truth of this statement: Messrs. Frith & Co., Reigate; Messrs. G. W. Wilson & Co., Limited, Aberdeen; Mr. H. N. King, of Shepherd's Bush; Messrs. T. C. Turner & Co., of Barnsbury; Mr. Resta, of Bayswater; Mr. T. Griffin, of Weybridge, and many others, the total sum obtained for them amounting to many hundreds of pounds.

Then, again, the Union is written about as if it were composed of a clique of London photographers and publishers, who work exclusively for their own benefit. Such is not the case, and the earnest desire of the Committee is that every photographer in the land shall participate in the benefits which the Union undoubtedly confers on all who belong to it, and if provincial photographers hold aloof it is their own fault, and they themselves are alone to blame.

The efforts of the Committee are devoted impartially to the interests of the profession generally all over the kingdom. At a meeting of the principal view publishers, held at the Manchester Hotel, London, a short while back, this was fully recognised, with a result that they one and all joined the Photographers' Copyright Union.

In conclusion, I may say that I have known many cases of photographers in provincial towns who, from want of knowledge of how to act, have missed chances of making four or five pounds, and I confidently ask every one concerned in their own interests to join a Society which is daily becoming more popular and useful.—I am, yours, &c.,

HENRY GOWER, *Secretary.*

Botolph House, Eastcheap, London, E.C.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, whole-plate camera and backs, for Hughes's Pamphengos quarter-plate (square) condensers, enlarging lantern.—Address, F. CHERRY, 40, Great James-street, W.C.

A 9×7 field camera, collapses, single dark slide, perfect condition; wanted, quarter-plate camera or whole-plate lens in exchange.—Address, S. E. KELF, 189, Southampton-street, Reading.

Wanted Lancaster's or cheap stereo camera and slides (or adaptable half-plate) in exchange for half-plate studio camera and slides, or first-class interior background 8×8.—Address, H. WARD, 98, Edith-grove, Chelsea, S.W.

Will exchange half-plate studio camera, eight-inch bar burnisher, large head rest, for whole-plate camera with three slides in good condition.—Address, CHISHOLM & Co., Photographers, Kinloch, Campbeltown, N.B.

Will exchange burnisher, seven-and-a-half inch bar, cost 32s. 6d., good as new, used but little, also two No. 3 Darlot lenses for a twelve-inch X. L. C. R. rotary burnisher or other good rotary twelve-inch burnisher.—Address, AMERICAN PORTRAIT STUDIO, New Frodingham, Doncaster.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

A. SMITH (Derby).—The address is Winterthur, Switzerland.

HAMLET.—By far the most exhaustive articles on the subject are those that appeared in this JOURNAL last year.

FLINT.—The knees and hands can be got into focus equally with the face by slightly swinging the back of the camera.

W. BENNINGTON.—Thanks for the enclosure. We have recently taken the opportunity of denouncing these Free Portrait Swindles.

LOST IN THE COUNTRY says: "Please state the addresses of the leading foreign lens-makers."—In reply: Steinheil, Munich; Voightlander, Brunswick; Zeiss, Jena; Goerz, Berlin.

MR. J. STERRY writes: "Is there not a mistake in the answer to 'W. N.,' page 176? He asks for specific gravity of ten per cent. of ·880 ammonia, but the answer gives ten per cent. of NH_3. Should it not be ·985, instead of ·960?"

BLINDS.—It must depend upon the form of the studio and its size. Green or dark blue "blind holland" is about the best material when the sun is shining on the studio. Their arrangement is more a matter of convenience in working than anything else.

THORNTON writes, asking the cause of spots on an enclosed print, which was toned in an ordinary sulphocyanide bath.—The spots are due to air bells adhering to the paper for some time while the print was in the fixing solution, or it might be while it was in the first washing water after fixing.

EXCELSIOR.—If the studio is of good width, the present idea will do; but, if it be narrow, it will be desirable to have some lower side light. The height to the ridge should be governed by the width of the studio with that form of roof. Four feet six or five feet at each end opaque, the rest may be of glass.

COPYIST.—The triplet can scarcely be called an obsolete lens, as it is still used by some of the best workers as a copying lens. For this purpose it answers admirably. We notice that it still finds a place in the latest catalogue of one of our principal opticians. The price required is not by any means too much.

NOVICE (S.E.)—If you make the enlargements by daylight, no condenser is required; simply make the arrangements according to the diagram quoted. The nine-inch focus rectilinear will do quite well for enlarging from half-plate negatives; for the whole-plate size, use the eleven-inch one, or even one of longer focus if you possess it.

J. E. asks how much formic acid per ounce should be used as a preservative of pyro, and will it render sodic sulphite unnecessary; also if ammonium carbonate would injuriously affect Ilford isochromatic plates if used in development?—We do not ourselves employ formic acid for this purpose, preferring sodic sulphite. Ammonium carbonate will not act injuriously.

S. asks: "Can you give a suggestion as to the possible cause of the spots and fading on enclosed prints? Is it that they are not properly fixed? Combined toning and fixing bath used."—Imperfect fixation is the cause of the trouble. It is a rather common one with the combined fixing and toning bath, particularly in inexperienced hands. Why not tone and fix separately? There would then be a greater chance of permanency.

A. BENDON.—Because the pictures are not sharp, you should not condemn the lens without knowing whether or not it is at fault. Many negatives taken with so-called "fixed focus" lenses are unsharp, though it is not the fault of the lens, but on account of its not being fixed at the right focus. That may be, and probably is, what is the matter in your case. Try the lens on another camera, if you have one, and see that the image is sharply focussed.

B. SIMES.—Canada balsam may be obtained from any of the optical and philosophical instrument makers. If you have had no experience in the work, you will do better, perhaps, to take the lens to an optician and let him recement the glasses for you than attempt to do it yourself. If you have not a lathe and proper tools, you will, doubtless, find a difficulty in getting the lens out of the cell and burnishing it in again after the glasses have been cemented.

PROFESSIONAL says: "I shall be glad if you could oblige me with the name and address of a French photographic paper, weekly, similar to your own, the JOURNAL, containing advertisements such as situations wanted and situations vacant. I have sent for several French photographic papers, but they all turned out to be monthlies, and not the kind of paper I want."—In reply: There is no French photographic resembling this JOURNAL in the respects named.

R. SHORTER.—There is no "trade union" amongst photographic *employés*. One or two attempts have been made to form one, but they ended in total failure. With regard to the desirability of forming such a union, we do not see what useful purpose it would serve. Photography is not, in any way, like the trades in which the unions have proved successful. In it all depends upon the individual skill and artistic ability of the worker as to the remuneration he is able to obtain.

C. W.—If the apprentice's indentures are not stamped the document is not a legal one, and therefore the young man can leave you at any time. We should not be surprised if he does so, considering what he says and the long hours he is working and the nominal wages he is receiving. If he is such a valuable hand in the studio and in outdoor work, had you not better make some equitable arrangement and retain his services? Certainly you cannot hold him by an invalid document.

J. E. G. (Westward Ho!)—1. One object in registering a photograph in which you have copyright is to enable you to bring an action against any infringer. No action can be brought until it has been registered at Stationers' Hall, and then the action is prospective, not retrospective. A registration fee of one shilling must be paid at the time. One penny is charged for the printed form, on which the description of the photograph is written, and it is desirable, although not absolutely necessary, that an unmounted copy of the photograph be attached to the form. 2 and 3. We have not heard anything further about acetylene or the new battery mentioned.

R. EATON.—1. The most simple test to apply to the lens is to see if it defines sharply, has a fairly flat field, and works to focus. 2. The maker you name has made many lenses of great excellence, and you will be quite safe in selecting one bearing that name.

S. S. J.—As the water is supplied to you "by meter," you will not, of course, be charged with what you have not had through it. Indeed, in that respect you are better off than those who have not a meter, as they will have to pay, or have already paid, for what they have not had. We fear there is no redress for loss of business and inconvenience through the failure of the water supply. Frost seems to be a saving clause in the Water Companies Acts. Photographers, like many others, must "grin and bear" the loss as best they can.

OMEN writes: "What are the bad effects, if any, of not using a focussing glass with constant studio work? I find that I use my right eye by bringing it nearer the ground glass than the left, and it seems to me to affect it, as I find it misty after, and specks float before it, and a slight nerve pain. Do you know of any similar case, and is it caused by not using the focussing glass? Also I should like to know a good man to consult or a hospital."—Evidently the focussing strains the eyes. Probably a focussing glass would be an assistance, or spectacles may be required, as the sight may be failing. If spectacles are necessary, no time should be lost in obtaining them, and of a suitable kind for the case.

J. & H. J. ask: "What composition would be best to cover the wooden sides of large glass-bottom dishes for developing bromide prints? Also what kind of taps would be the most adapted to fix in the bottom of them, because they are too large to be tilted, and where could we get them?"—Paraffin wax is as good as anything, or a mixture of asphaltum and beeswax may be used; both answer well. Glass or ebonite taps will answer. The former may be obtained at the chemical-apparatus manufacturers, and the latter from the Silvertown Company. If the dishes be strongly made, there will be no need for taps, as they may be emptied by tilting. We have seen them five feet by four, and larger, being so used.

NEW COMER writes as follows: "I have just commenced business in this place, and while the studio was being built and the premises fitted up I filled up my time by taking views of the chief places of interest in the neighbourhood. These I have put into the window and am offering for sale. I have just received a letter from another photographer in the town threatening to put the matter in his solicitor's hands unless I at once withdraw the pictures from sale and publicly apologise to him, as he had previously taken the same subjects and copyrighted them. Can he stop me? If so, he will, as he is much annoyed at my coming here."—Simply laugh at him for his stupidity or "bluff." He cannot interfere with you, as he has no copyright in the subjects themselves, though he may have his photographs of them, and these you have not copied.

BRIGHTON says: "Would you be good enough to tell me what would be necessary to fit up the zinco process, or whatever the process may be named, in which the line or stipple block is used, as in the publication of Newnes' *Round the World*, or Marion's *Men of To-day*, all being published at 6*d*. each. As these pictures are excellently well done, they seem to be driving collotype pretty hard, and, as I thought of publishing, I should be glad to learn if there is any book published that would guide one in the early stage, and also your kind advice in the matter as to the best way to set about the working of the process."—The process is described in the ALMANAC for 1893, in the article *Modern Methods of Book Illustration*. This will give you a fair insight into its *rationale*, but for practical purposes you will require some personal instruction. Consult Mr. Calmels, of Furnival-street, Holborn.

PUZZLED writes: "I shall esteem it a great favour if you can assist me in stripping wet-plate films. The formula I have been using is—water, 300 parts; gelatine, 30 parts; glycerine, 4 parts; glacial acetic acid, 3 parts; and the procedure is, dry the negative level and pour on a given quantity, say one ounce for a half-plate; allow to dry spontaneously, then cut round edges, and away they should come; but they do not. I have tried all kinds of glass; some come off, some don't—same treatment. Can you help me? The plates, before cleaning, are soaked all night in nitric acid and water, equal parts. Then I have tried beeswax, chalk, and benzole during the final polish, and all of no certainty. I enclose some samples."—The trouble is due to the glass not being rightly prepared in the first instance. If it be well polished with French chalk, or waxed and polished, there would be no difficulty in stripping the film when the gelatine becomes dry. Indeed, there would be a greater difficulty in keeping it on the plate. More care in the polishing with the French chalk, or in the waxing, will overcome the difficulty. By the way, we notice that the pyroxyline with which the collodion is made is of a very rotten kind. One of a tougher description would give a firmer film.

CONTENTS.

	Page
EQUALISING THE ILLUMINATION OF A PHOTOGRAPH	177
PRACTICAL HINTS ON STUDIO BUILDING	178
INTENSITY FIRST, OR DETAIL?	179
JOTTINGS. By COSMOS	181
SCREENS. By EDWIN C. MIDDLETON	182
LIVERPOOL SPRING EXHIBITION	183
OUR EDITORIAL TABLE	184
NEWS AND NOTES	185
RECENT PATENTS	185
MEETINGS OF SOCIETIES	188
FORTHCOMING EXHIBITION	190
CORRESPONDENCE	190
EXCHANGE COLUMN	191
ANSWERS TO CORRESPONDENTS	191

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CARBONATES.

From time to time we have have had occasion to refer to the fixed alkalies and their carbonates in connexion with modern development, and, as during the last two or three weeks ammonium carbonate has been referred to in the same connexion, it may not be out of place to say a few words on the carbonates of ammonium, and of the alkalies generally, or, at least, those commonly employed for photographic purposes.

Of those more commonly employed—those of sodium, potassium, and ammonium—there are usually stated in the text-books to be three definite salts of each base, namely, the normal or neutral, the acid or bicarbonate, and the half acid or sesquicarbonate, although it is doubtful whether the latter salt, even of the fixed alkalies, is really a definite compound, or only a mixture of the other two. About the carbonates of ammonium, however, there seems to be such a difference of opinion amongst the authorities on the subject, that they stand on a still more doubtful basis. Carbonate of lithium, which has also been proposed for use in photography, is only recognised in one form, that of the normal carbonate, Li_2Co_3, and appears to be a stable, though somewhat insoluble, salt. In this case too, from the fact that the recognised compound is more soluble in water impregnated with carbonic acid, it would appear possible that there may exist other compounds that have never been isolated; at any rate, the carbonates generally appears to be open to a great deal of uncertainty.

Commencing with the neutral ammonium carbonate, we have a salt which is only known in solution, and is supposed to be formed by saturating an alcoholic solution of the sesquicarbonate with ammonia; but, from the circumstance that, on evaporating this solution to crystallisation, only sesquicarbonate is formed, it would appear rather as if the solution consisted of the latter salt merely, with excess of ammonia, as, in plain fact, it does.

The acid or bicarbonate seems to be the only compound of really definite composition that has been isolated, and is represented by the formula NH_4CO_3. This is formed by saturating a solution of ammonia or its sesquicarbonate—still to be mentioned—with carbonic anhydride, or, it is stated, by treating the sesquicarbonate with alcohol, which separates the normal carbonate, and leaves the acid salt. The sesquicarbonate, as may be inferred, thus has the composition of a mixture of the acid and the problematical normal salt in the proportion of 2 : 1, and, though it can be obtained as a definite substance, it is so liable to change, from the easy manner in which its constituents separate from one another, that it is a very dubious salt to rely upon. In fact, the complete volatility of the whole of the constituents of these salts and their easy separation render it extremely difficult to fix their exact constitution.

According to Gmelin, the acid carbonate, if kept in solution, and especially if exposed to the air, gives off carbonic anhydride, and becomes more of the nature of the sesquicarbonate; while, on the other hand, the latter salt in the form of crystals gives off ammonia, and is converted to the acid form, but in solution, especially at a raised temperature, gives off carbonic anhydride, and is converted into a solution of the normal carbonate. Finally, by boiling, crystals of the acid carbonate are formed, and the remaining solution consists of a more or less indefinite mixture of normal carbonate and free ammonia.

From what has been said it will be seen that, if we wish to employ these salts, especially the sesquicarbonate, we must procure them of good quality and use them fresh. As a matter of practice, the sesquicarbonate of ammonia is the only one that enters into photographic use, and a very good test of the quality of this is found in its appearance. It is found in commerce in hard fibrous cakes or lumps, having a very powerful ammoniacal odour, with, if fresh, a translucent appearance, which gradually, on exposure to the air, gives place to a dead white powdery look on the surface. On breaking up the lumps and exposing a fresh surface, it will be seen to possess this same transparent character, and if only that be used, and the powdery outer surface rejected, a solution of fairly definite constitution may be relied upon.

Although, this change is supposed to take place with some rapidity, and, from the powerful odour of ammonia given off, it might be supposed that the sesquicarbonate became wholly changed to the acid form in a very few days, we a few days since examined a sample that had been preserved in a stoppered bottle, in cubes not quite so large as ordinary lumps of sugar, for a period approaching thirteen years. Although it has not been opened for many months, probably for a couple of years, the bottle was at one time in constant use, yet, on opening it recently and applying the nose, the odour was too pungent to prove comfortable, and, on examining the contents, a great portion of them retained the fibrous and translucent character of the fresh salt, though some of it had become quite opaque as well as moist from the action of the H_2O set free in the decomposition.

A portion of this salt dissolved in water gave off very little smell until a small quantity of slaked lime was stirred in,

when it became as pungent as if made from fresh salt and, applied in development in conjunction with pyro, behaved in every way as vigorously as if really fresh. This forms a ready plan of revivifying the salt when it has lost a portion of its ammonia, but the energy thus restored is more probably that of free ammonia than of the sesquicarbonate, though it is possible, from what has been said in the earlier portion of this article, that it is a mixture of indefinite character.

There is another ammoniacal compound of which we hear very little, namely, the carbamate, which has the same composition as the normal carbonate minus the elements of water. This, from its composition, would seem to promise more energetic developing powers than any of the salts already mentioned, but we had it on the authority of a leading operative chemist some years ago that there was a great deal of so-called carbonate in the market that was really carbamate, and that it possessed practically no developing power at all. Certainly one very frequently comes across very anomalous behaviour when using ammonium carbonate that may possibly be traceable to this cause.

The fixed alkaline carbonates as usually found in commerce, if of fair condition, are more reliable, the only disturbing element in their cases being the amount of water contained, though even these, in solution, are liable to gradual alteration and deterioration.

Death of Mr. James Ross.—By the death of Mr. James Ross, of Edinburgh, photography loses its oldest representative of the profession; at any rate, in the north. The firm of Ross & Thomson, photographers to the Queen, was in existence long anterior to the introduction of collodion; and in the "forties" they were renowned for the singular excellence of their views taken on albumen plates. When Mr. Thomson retired from the firm, now many years ago, Mr. Pringle assumed his place as a partner, and the firm of Ross & Pringle was long favourably known. By the removal of Mr. Ross, who had attained the ripe age of eighty-one, and whose death took place on the fifteenth of the present month, all the partners of this once celebrated firm are now dead.

Filling Gas Cylinders.—The recent fatal cylinder explosion at the Fenchurch-street Station has formed a fruitful theme for conversation and discussion at some of the photographic societies since its occurrence, and the Photographic Club has been no exception. At its meeting last week, while the topic was under consideration, one of the members asked if those who supplied the gas would, if requested, put less in a cylinder than it was intended to hold—say, for example, fifteen feet in a twenty-feet cylinder. The reply given by several present seemed somewhat anomalous, They would not. They, it was stated, would only charge the cylinders to their full capacity. If that be correct, we have little doubt that the compressors have a good reason of their own why they will not. There is no question that the late unfortunate accident will again, for a time at least, shake the confidence of the public and the users of oxygen in cylinders. Many nervous persons would feel more secure if their cylinders were only filled three-fourths full, and would be content with that for the twenty-five per cent. of extra safety secured or supposed to be secured.

A Painter's Costly Freak. — A somewhat amusing case was decided in the Paris law courts, one day last week. Sir W. Eden paid Mr. Whistler, the well-known painter, 100*l.* to paint a portrait of Lady Eden. When the portrait was finished it was exhibited in the Salon, and then Mr. Whistler came to the conclusion that he had not been paid sufficient for the work, and refused to give it up, and afterwards scratched out the face and painted in that of another lady, who then claimed the portrait as hers. Sir William took legal proceedings, with the result that Mr. Whistler was defeated. He was condemned, firstly, to deliver up the portrait of Lady Eden, as he originally painted it, under a penalty of a fine in case of delay; secondly, to refund to the plaintiff the 100*l.* he had received as the price of the picture; and, thirdly, to pay Sir W. Eden 1000 francs by way of damages. This case shows that it does not do, at least in France, for artists to go behind their agreements, or to tamper with their sitters' portraits. The incident calls to mind what we saw in a fourth-rate photographer's show-case some years ago. The case contained a score or so of portraits, and the conspicuous announcement, "All this lot not paid for."

Forgery of Bank Notes.—It is seldom now that one hears of attempts to make counterfeit bank notes by the aid of photography, yet in these days of photo-mechanical processes there would seem to be greater facilities for making them than when photographic forgeries were more prevalent. A case of the kind has, however, been before one of the police courts for some little time, and on Thursday, last week, one Warren Curtis Laffray was committed for trial for possessing forged plates of photographs of American bills or promissory notes, and further with inciting a photographer to forge and make by photography the said plates. In this case it was American notes that were desired to be forged, and not our English bank notes. These are plainer and simpler in design than are, we believe, the notes of any other country, and it is upon this simplicity that the authorities rely against forgery, because, if committed, it would be the more readily detected. With the intricate and elaborate coloured designs of some foreign notes counterfeits are more easily made by taking advantage of orthochromatic photography, than with our own plain printed note, with its peculiar crisp-feeling paper, which, by the way, is far more difficult of imitation than is the printing on it.

The Westminster Frescoes.—Photographs are not the only kind of pictures that suffer by exposure to the atmosphere. The wall paintings in the Palace of Westminster are a case in point. A Parliamentary paper has just been issued on the subject of their deterioration, and it embodies in it the opinions of Professor Church, the Professor of Chemistry to the Royal Academy, who has been engaged in rescuing the pictures from the effects of time. London smoke, it would seem, has been the most destructive agent in the case. It has not only deposited a layer of soot, which, it appears, has had no very destructive action *per se*, but it has formed injurious compounds with the chemical constituents of the pigments employed by the artists. Moisture, which is a most destructive agent in the case of photographs, is also a factor in the deterioration of the frescoes, as well as is the rottenness of the plaster upon which they are painted. On the whole, it almost appears that the pigments employed by the artists were the primary source of the trouble. Is that not somewhat of a reproach to modern artists? The National Collections of paintings of all countries show examples of pictures centuries old, in which the colours are as good as when they were first painted. Then the painters themselves, it should be kept in mind, generally prepared their own pigments, and with a consideration as to their permanency, instead of as now relying upon the artist's colourmen. Photographers may take some sort of comfort from the fact that photographs are in existence of about the same age as the Westminster frescoes that have suffered less deterioration, and in the case of Daguerreotypes, if deteriorated, can be restored to their pristine condition in fewer minutes than the frescoes will take months work upon, and then only with more or less success so far as the artist's original work is concerned.

The National Portrait Gallery. — When the House went into Committee of Supply, one day last week, on the Supplementary Vote for the cost of purchase of portraits for the National Portrait Gallery, the question was asked as to when the portraits, now in the Bethnal Green Museum, would be removed to the new building? Sir J. Hibbert in reply, regretted that unforeseen delay had arisen, but "hoped that the transfer would be com-

pleted before long." At present the National Collection of Portraits consists of paintings alone. But why should it? we have more than once asked. Why should not a portion of the Exhibition be set apart for portraits produced by photography? The prime object of a collection of portraits is the likenesses of the individuals depicted rather than a collection of works of high art. Portraits, as paintings, of many illustrated personages, both literary and scientific, are not available, or even in existence, yet their counterfeit presentments should be in a National Collection of portraits. Photographs of them may, however, be had, and they would be in many instances far better likenesses of the individuals than some of the oil pictures of others now in the Collection. There are, or were—we have not been there lately—in the Science and Art Department, South Kensington, some dozens of photographic portraits of men of scientific eminence that convey a better every-day idea of the personages than would any oil painting. It is true that these photographs—as they are most of them thirty years, and upwards, old—are in various stages of decay. They are silver prints; but, now there are permanent processes available, why, we again ask, should not a National Collection of Portraits include photographs when paintings are not forthcoming?

ON THINGS IN GENERAL.

Since my last letter I have been travelling along that weary way that of late so many have journeyed along, but I am thankful not to have experienced what I suppose we must call the unfortunate fate of some, for I am back again, though my armour feels heavy, and "fits too much." I have been able to hear much that has been going on; among the rest, the announcement of the award of the progress medal which is given by the Royal for the most important additions to knowledge made during the last three years. Why do the cavillers make such a pother over the matter, which is really such a very simple affair? Firstly, it is only necessary to read Dr. Emerson's work to know what he thinks the most important progress that had been made up to the time of its publication; secondly, he ate the leek, and showed that the work was worthless, *ergo* that alone was progress. As to fuzziness of focus being a new discovery, students of photographic progress should consult the archives of the Royal, and see how Claudet raised a storm on the same subject about a quarter of a century ago, the outcome of which was the invention by an eminent maker of a brand-new lens, capable of taking either fuzzy or sharp pictures at will.

That was a good idea of the Editor to ask for the narration of experiences with heating apparatus; but, so far, the accounts of personal haps or mishaps have been strangely contradictory. The most striking account is that given on p. 191 by R. Stewart. There must be some error somewhere. A high-pressure system that, with three hundred feet of piping, would not work efficiently must either have had that piping spread over a very large area, or the construction must be faulty, if enough heat could not be got out of it. There is a studio located not far from the place I am writing at which, with only half that length, heats a studio with a floor space of nearly four hundred superficial feet, a dark room of nearly a hundred, and two other rooms of over a hundred each, and, when well fixed up, the water, when it reaches the coil after making the circuit, will still be hotter than boiling water; and, as to bursting during a frost, it would be impossible with a well-banked fire. The probability is that the water had not been put in the pipes properly, and that a quantity of air had lodged in such a way as to stop the circulation entirely, the heating taking place from the furnace through both inflow and outflow pipes. High-pressure pipes should never be first filled by pouring the water in; the pipes should be unscrewed, and the water put in by a force pump at one orifice at the separation, and pumped in till it flows freely through the other. The slight amount that gets dissipated may be poured in as usual. I have seen a case, when the maker was sent for to examine such an instance as is indicated, where there was no flow, but an equal heating from both pipes. Finally, it costs very little more to have non-freezing liquid put in if frost is feared.

It is entirely contrary to the principles guiding these essays to puff any maker or his products, but it is common fairness to give another experience as a set-off to that narrated at the Photographic Club on the 13th inst. with respect to Alpha paper. I have a British Journal Photographic Almanac with such a print in. It is a very beautiful picture, excellently printed, and is as good as on the day I received it from the printers. If there is any yellowing, it is very slight. Perhaps the whole discussion is academic in character, for I am informed that this paper is not now made.

With regard to the yellowing of the whites of platinum prints, there cannot be a doubt that the majority of prints hitherto produced do exhibit that defect after the lapse of a few years, and it would be a very fortunate thing if we could be absolutely sure that a fourth bath of acid would prevent the mischief. But will it? Is it not probable that there is a slight trace of platinum in organic combination which is not eliminated, and whose presence only becomes visible after a time? It would be interesting to know what the Platinotype Company's experience on the matter may be.

Before concluding, I should like to make another suggestion. The Hon. Secretary of the Manchester Photographic Society gave, at a recent meeting, some very interesting details of his experience with the incandescent gas light for enlarging and reducing. It is very remarkable that, with so exceedingly powerful an illuminating agent as this, and one so easily handled, we have not more practical experience of its powers in the direction Mr. Casson was working. The suggestion is that the Royal Photographic Society should form a Committee and give a thorough trial of the capabilities of this, the most powerful of hitherto constructed gas lights. It is true that the actinic power of the light is stated to be much below what its colour would lead us to expect; but, let us have its powers or its defects put before us in figures that could be understanded of the multitude.

Free Lance.

CONTINENTAL NOTES AND NEWS.

Prize for Hand-camera Users.—The *Photo Gazette* announces that a firm of American dry-plate makers offers a prize of 20*l.* to the hand-camera man who is quickest in exposing 100 plates—of course of the said firm's manufacture. What next?

Remarkable Subaqueous Photography.—Our Italian contemporary, *Il Dilettante di Fotografia*, has an article on Buntan's system of taking photographs under water. An accompanying illustration depicts a diver surrounded by denizens of the deep, and holding a hand camera, with which he is supposed to be taking photographs, the light proceeding from an oxy magnesium lamp.

"Artigue" Non-transfer Carbon Paper.—Dr. Mallman's plan of preparing this paper is by first moistening Rives paper, coating it with a solution of Nelson's gelatine, 1–2 per cent., 0·032 c.c. of gelatine being applied to each square centimetre of paper. When the gelatine is quite dry, finely powdered ivory black and ivory brown are dusted on the surface. The paper is either sensitised direct or by adding 0·20 to 0·25 grammes of potassium bichromate for each gramme of gelatine employed.

Liquid Gelatine.—A patent has been obtained by Herr Wiese of Hamburg for liquid gelatine made as follows:—

Chloral hydrate	250 grammes.
Gelatine	400 „
Water	1000 „

The solution is ready in forty-eight hours, and is said to be excellent for mounting photographs.

A Remedy for the Non-adhesiveness of Purified Bitumen on Metal Plates.—M. Léon Vidal says: "I have had occasion to remark that bitumen purified with ether and chloroform does not retain its solidity after development with essence of terebenthine, washing with a weak spray of water sufficing

to detach the image. To obviate this defect, I have tried the introduction into the bitumen solution of a half per cent. of pitch, and the adhesive qualities lost by the pure bitumen have been restored, while the sensitiveness has not diminished."

Snow Statuary.—*La Nature*, in one of its recent issues, gave a reproduction from a photograph of a gigantic bear which had been built up of snow. In the animal's right paw was placed a suspicious-looking bottle, and in the left a glass. During snowy weather, in some Continental countries, much amusement is obtained by an extension of the idea, prominent personages and other animals being reduced to effigy in this manner in the parks and open spaces. In Belgium it has been utilised for raising funds in aid of charities.

A Phlegmatic English Photographer.—The *Praktischer Rathgeber* is responsible for the following story about an "enthusiastic" English amateur. A fire broke out at the Hotel Washington, Grenada. Most of the guests were in the dining-room at the time, and at the first cry of alarm great confusion prevailed, and every one rushed off to his room to save his property. Not so an Englishman, who calmly rigged up his camera and coolly began to take photographs of the scene. One of the hotel lads excitedly told the Englishman that his room would probably soon be in flames, but the photographer replied in bad Spanish, "All right, I'll soon be there," and (so says our authority) he went on taking photographs, quite oblivious of the *débris* falling about him.

Preparation of Ferric Oxalate.—Many inquiries relative to the preparation of ferric oxalate have lately reached us. The following method, due to Herr Weissemberger, of Vienna, may therefore be of interest. It dispenses with the use of ferric chloride. Dissolve 96 grammes of ammoniacal iron alum in 500 c.c. of water at 30–40° Cent., and precipitate the iron oxide with 84 grains of sodium carbonate dissolved in 300 c. c. water. The precipitate is washed by decantation in cold water until alkalinity disappears, then gradually add 49 grammes of finely powdered oxalic acid. The solution, after filtration, should have a volume of a little less than 187 c.c. The finished solution should contain twenty per cent. of ferric oxalate and 1·2 per cent. of free oxalic acid —the normal ferric oxalate solution for platinotype.

Elimination of Hypo from Negatives and Prints.—A contemporary summarises the experiments of Herr Bannoir, of Berlin, made some years ago to determine the degree of elimination, by washing, of hypo from negatives and prints. The negatives were fixed in a bath containing, per litre, 200 grammes of hypo and fifty grammes of metabisulphite of potash, were then surface-washed, and next successively placed for ten minutes in dishes containing 100 c. c. of water per decimetre of plate surface. Each wash water was tested for the quantity of hypo it contained. Here are the results:—

The first wash water contained 0·155 of a gramme of hypo.
The second, 0·012 to 0·031.
The third, 0·001.
The fourth, 0.

Employing an old fixing bath, the following were the results:—

First washing,	0·116.	
Second	„	0·008–0·010.
Third	„	0·001–0·002.
Fourth	„	0.

A plate which gave 0·0004 grammes in the third wash water and 0 in the fourth was left in a fifth bath for twelve hours, and yielded up ·0005 grammes of hypo. Alum and acid also failed to eliminate the last traces, as, after soaking for twelve hours, 0·0005 was still found in the wash water. Albumen prints, treated in the same way as above and washed for five minutes, gave the following results:—

First wash water,	0·0930 grammes of hypo.	
Second	„	0·0030 „
Third	„	0·0006 „
Fourth	„	0·0005 grammes of hypo.
Fifth	„	0·0004 „
Sixth	„	0·0004 „

The seventh wash water, after twelve hours' soaking, had 0·0003 grammes of hypo in it. Here are the results with gelatino-chloride paper:—

First washing,	0·0645 grammes of hypo.		
Second	„	0·0036	„
Third	„	0·0007	„
Fourth	„	0·0006	„
Fifth	„	0·0005	„
Sixth	„	0·0009	„ (after twelve hours).

AMERICAN NOTES AND NEWS.

We are rather sorry to find that the proprietors of the New York *Photographic Times* have found it expedient to revert to the monthly issue of their always excellent journal. America is so large, and the photographers there are so numerous, that we thought a weekly might have been found a necessity. But wiser heads have deemed it otherwise, and, moreover, it is nobody's business but their own. That they know well what they are about we feel quite satisfied. The *raison-d'être* of the change, as stated, is that they are to concentrate the energy and money expended in publishing a journal every week in bringing out a high-class monthly magazine, quadrupled in reading pages and with more than four times the number of pictures, while the advertising pages are reduced to less than one-half that number, so that by this change the weekly periodical with one picture, and a limited number of reading pages, develops into a high-class art magazine, many times more attractive and valuable to the reader than a weekly could possibly be and in a more convenient form. All this we readily admit; but, for all that, we miss the weekly receipt of news of what's going on in America, and we hope that in time it and other journals may yet find it expedient to adopt a more frequent issue.

The February number of the new departure of the *Times* opens with an article on "The Sky" by H. P. Robinson. In this author's opinion, the weak point in American landscape photography is undoubtedly the sky. But what are American artists to do when Nature, so kind to them in many other respects, often denies to them the skies, or, in other words, the clouds with which the British artist is so very familiar, often much more so than he at all likes? The most sensible thing to do is to lay in a supply of cloud negatives obtained when and how they can, and use them with discretion in imparting to the skies that English-like characteristic so delightful to the artist. The time has long gone by, never, we hope, to return, when it was considered by some to be the acme of perfection in a photograph to have the sky one pure mass of white.

A biographical and critical account of a young American artist, Rudolph Eickemeyer, some of whose pictures have been exhibited in London, is interesting as showing his rapid transition from a mechanic's workshop to the position of being a gold medallist. No fewer than ten of his works grace the pages of the *Times*.

While we are having our explosions of compressed oxygen in this country, it would appear that Americans are not yet exempt from explosions of quite another, and a believed-to-be innocuous substance, viz., powdered magnesium. A quantity of flashlight powder, stored in a trunk, and presumed to be blitzpulver, was being brought by a waggon in charge of an expressman to the store of Messrs. McCollin & Co., Arch-street, Philadelphia. Not being made aware of the nature of the contents of the trunk, while unloading it, it slipped from his grasp, fell on the pavement, and the powder exploded with a tremendous report. The carrier was blown several feet away, his left leg being shattered, necessitating amputation. The street blazed with a fiercely burning light, and windows in the neighbourhood were broken. The *American Amateur Photographer* entertains the opinion that the blitzpulver was taken to the McCollin store in the trunk to evade the embargo on shipping

vessels liable to explode lately ordered by the Express Companies, and thinks that somebody ought to be held to account for shipping an explosive in that manner without any warning notice. We too think so.

But what *is* blitzpulver? It is not so very long since a quantity of it exploded when in the very act of its being poured away to be destroyed, in consequence of more than suspected danger, and killed two or three persons, if we remember aright, and this also in Philadelphia. It is supposed to consist solely of magnesium powder, but prepared in some way conducive to flashing with great rapidity upon ignition. The surmise is that this rapidity of flashing is brought about in some way or other by mixing with it some preparation of picric acid, perhaps the picrate of potash, or it may be the nitrate, or even the chlorate, of potash. When Mr. McCollin was last in England he left with us a sample of what we thought at that time was blitzpulver, but, on treating some of it with distilled water, and evaporating on the stage of a polarising microscope, we could not discover the presence of any crystallisable salt. It seemed to be nothing but powdered magnesium, a substance which, by itself, will certainly not behave in the manner attributed to blitzpulver. We know enough concerning the possibilities of the picrates and the other potassium salts mentioned, when mixed with magnesium, to give a very strong caution to photographers to beware of them.

A hope is expressed that the never-to-be-praised-too-much system so fast being adopted in this country of having standard flanges and screws for lenses will also before long become adopted in America. We can assure the transatlantic fraternity that if they do so they will not only never regret it, but that they will never again return to the go-as-you-please order of things as connected with lens flanges. A complete set of the Royal Photographic Society standards have been deposited with the American Institute's Photographic Section, where they may be examined by all interested. We know their skill in all kinds of mechanism, and feel certain of an equal degree of accuracy in measurements being achieved by American mechanics as that obtained by the Messrs. Taylor, Taylor, & Hobson, of Leicester, who are noted for the skill and precision they have attained in the higher departments of mechanical science.

The *Times* informs us that Herr C. P. Goerz, the celebrated German optician, has opened a branch office in New York, from which American photographers can be supplied with his lenses without delay, and at *German prices*. What about the import duty? The German optical element seems now to be very strong in America.

On account of "poor health" Mr. W. H. H. Clark has severed his connexion with the editorship of the *St. Louis and Canadian Photographer*. Mrs. Fitzgibbon Clark, however, still retains her position as business manager. Grand old Abraham Bogardus also still continues a leading contributor. Some little time ago he sent us his portrait, which we prize very much. From present indications, writes Mr. Bogardus, this is to be a year of sharp rivalry among the photographic publications. Some of them inform their readers of concluded arrangements to impart wisdom in solid chunks during the year. They give the names of writers, foreign and native, who are to furnish the said wisdom guaranteed to more than fulfil the great expectations of subscribers. Some of the announcements are high-sounding enough to make us little fellows, without letters tailed on to our names, tremble in our boots, shoes, or slippers. Yet Americans have learned from politicians that promises, like thin glass negatives, are often knocked into smithereens before they have rendered any *positive* service. We too remember an editor in our own country who scarcely ever commenced a new volume without giving a large list of influential writers from whom contributions might be hoped for during the year then before them!

In a notice of Fritz Luckhardt that appeared in the March issue of *Wilson's Photographic Magazine* there is a slight misapprehension. It is there stated that Mr. Luckhardt in early life "went to London and obtained employment in the laboratory of the then famous chemist, J. R. Johnson, one result of their combined labours being the rotating panorama camera." The truth is, that Mr. Luckhardt did not practise as a chemist when in Mr. Johnson's employment in Red Lion-square, but in another capacity, rather what would be called that of a shopman; and Mr. Johnson's colleague in the above-termed rotating panoramic camera (the pantascopic camera) was its co-inventor, Mr. James Harrison, who, along with Johnson, obtained a patent for the same.

The death of D. C. Chapman is recorded. Mr. Chapman used to be a leading member of the American Institute. He was engaged by the late Mr. L. M. Rutherford in connexion with astronomical photography, and obtained a world-wide reputation for his ruling of glass plates as gratings for spectroscopic work. He subsequently was engaged by Professor Henry Draper as his assistant in investigations in spectrum analysis and the constitution of the sun. He afterwards accepted the position of chief photographer to the United States Geodetic Survey at Washington. His place will be difficult to fill.

FROM SUNSHINE TO SHADOW AND BACK.

III.

In previous papers I have stated my belief that what happens to the small circular area happens to every particle in it. It were, perhaps, more accurate to say that that which is done to a small frustum of the film, and to the film in its immediate neighbourhood, is done to all the particles within the frustum. It was for this reason that I expressed the conviction, subsequently reiterated by Mr. Herbert S. Starnes, that the silver salt was reduced in layers. If, however, we wish to penetrate the mystery which surrounds the formation of "under-exposed" negatives, "perfect" negatives, negatives exhibiting "halation," negatives which give "density" without "detail," and negative-negatives, or reversals, and study their nature and constitution with the view of bringing them under one common coop, it will not do to forget that "what is sauce for the goose is sauce for the gander." It is easy to get a "theory" to account for one form of image, but difficult to find one to fit them all.

A sufficient quantity of light emanates from each segment of our scale, passes through the lens, and is reprojected on the focussing screen in such a manner that it is visually recognised as a correct representation—inverted. This, however, is absolutely the case only when the highest light in the one is, area for area, of the same intensity as in the other. Otherwise, physiologically speaking, the image can only approximate to the truth. The insertion of a very small stop prevents the unaided eye from perceiving aught save the brightest segments, the others being lost in obscurity, and, were the plate to depict only what we see, we should say it was "under-exposed." On the other hand, we might have a scale of self-luminous bodies of different intensities from dull red to dazzling white, in which case the brighter luminosities might be indistinguishable one from the other, and thus afford a type of image which, were it reproduced as a negative, we should call "over-exposed."

The sensitive film, as manufactured for the photographer's use, is, in its power of depicting range of contrast, far more restricted than the human retina. There are two causes for this:—

(A.) The amount of silver salt is small.

(B.) It is seldom, if ever, all used up.

The imperfect transparency of the vehicle also, to a certain degree, further hinders the film from expressing great contrast.

It is, however, with the second reason that we are chiefly concerned at the present time.

Hitherto, in order to be more widely understood, we have taken as our unit of density the utmost opacity producible on a typical film of constant sensitiveness, subjected, after unit exposure, to unit immersion in unit developer. To the moiety of this opacity we assigned the numerical value 0·5. But at the outset, when we referred to our conviction that the "neutral" phase of image was the best from which to start in any endeavour to ascertain the relationship existing between the three most salient forms, we saw at once that to alter the numerical value of our unit would lead to ambiguity and obscure perception. On the other hand, to retain it would lead to explanatory prolixity. As a compromise, let us multiply all our original units by ten, but, otherwise, let all the other conditions, such as constancy of light, temperature, sensitiveness, immersion, and development, be taken for granted throughout, unless the contrary be stated.

Let us now suppose that we have already obtained a neutral image with a given exposure. This image is compounded of two equal mean densities, one of which would have been increased, whilst the other would have been diminished, by the developer had the exposure been further prolonged.

We know, moreover, that within and beyond the period which admits of the formation of a neutral image there are two periods, one of which would give a good negative, the other a good positive.

Say that the period which has given us density without detail is 100, then, theoretically, we might have:—

Exposure	10 = Density	10 +	0 = Negative.
„	100 = „	5 +	5 = „
„	1000 = „	0 +	10 = Reversal.

Now, in the neutral form of image, the (apparent) ratio of exposure to both densities is 20 to 1; yet it has taken an exposure 100 for the *increment* of density 5 (giving the full ratio 20 to 1), but only 90 for the *decrement* of density 5 (a ratio of 18 to 1) with the given exposure. This "image" is thus compounded of two equal mean densities, one of which would have been increased, whilst the other would have been diminished by the developer, had the exposure been further prolonged. We know, moreover, that both within and beyond the period which admits of the formation of a neutral image there are two periods, one of which would give a good negative, the other a good positive, image.

Reverting to our scale of intensities (or exposures), we see that, with a given immersion in a given developer, the two extremes—the least and the greatest—will at one moment be represented by a uniform degradation of the film; a mean density, or rather two mean densities, one rising and one falling.

If we had the same command over the chemical ingredients which constitute what we call developers, we could *absolutely* decide upon the form of image we should produce, *no matter what the exposure had been.*

As a matter of fact, however, it is only by the most intelligent and skilful employment of the materials at our command that we can transform the "latent" image of one type into either of the other two. It is not, nevertheless, at all a difficult task for any one, tyro or expert, to so develop his film that no human being can tell whether it was meant to be a negative, a neutral, or a reversal, or, in other words, a representation of the original subject—

1. In reversed contrasts, as a normal negative;
2. In no contrasts, with a certain amount of density, but no detail;
3. Or, as a reversal—a true positive.

What, then, are the essential issues which result if the foregoing statements be accepted as practically, or, to all intents and purposes, true? It follows, I maintain, that—

A. All the other conditions being constants, a variation in the intensities "copied," or in the length of exposure given to unvarying intensities, may readily be made to result in vastly different *ratios* between the *period* and the *densities.*

B. All the other conditions being constants, a variation in the relative proportion of the ingredients constituting a developer may readily be made to result in vastly different *ratios* between the *period* and the *densities.*

As an example, take the every-day photographic subject—a restless, agile child, black-haired, pink-faced, white-frocked. In frock, face, and hair the eye detects many shades. The operator gives *a number of similar exposures, all equal, and of the briefest,* and proceeds to develop. With the first plate—over-estimating the power of the light, which has been constant throughout—he applies his ingredients in a certain proportion and strength. The frock comes out dark and darker. After a long time the face appears—a high light—and, continuing the development for a considerable time thereafter, one high light only, can be detected on the hair. The plate is put aside in the developer, but nothing more comes into sight save fog. When fixed, the negative gives, practically speaking, a frock of monotonous opacity, a face of the fiercest contrasts, and hair of almost uniform transparency. The next plate, treated at once to a much more alkaline developer, most probably comes up very sweetly, showing soft gradations in hair, face, and frock, the latter being by no means too dense.

If, however, the plate were but very slightly under-exposed, and an alkaline developer of exceptional strength had been applied, or if the plate had been soaked in dilute accelerator subsequent to exposure, but prior to the application of the mixed solution, then we would expect to see the hair plucky, the face flat, and the frock about the same density as the face, but flatter still, or else we would look for a flat-all-over, feeble negative, *minus* the highest lights, and *minus* the deepest shadows, in both of which cases we would expect to detect signs of halation, and, had the developer been stronger, of solarisation.

It is a fact acknowledged by many that the words "under-exposure" and "over-exposure," when applied to a film that has been, is, or will be developed, have no significance whatever unless referred to some definite mixture of certain chemicals, which the speaker has in his mind, and which he conceives his auditor to take for granted. And this is so, and cannot be too thoroughly realised. The developer is the test of the light, and different tests will give different results. The variations will not only be in amount of density, but in comparative amount of detail—*a function of density.* And so with our draughtboard, where we can have at will density with the detail of our subject reversed as in a good negative; density with the detail as it appears to the eye, as in a reversal; or density with no detail at all, as in that form of image which I have styled the "neutral phase."

Here—if we like to take a much-used draught-board as our subject—our detail is at a minimum, and here we can measure the amount of the two forms of density under the simplest conditions.

Here we have a number of more or less dark areas represented by our film in approximately one degree of opacity, and here also we have a number of white areas depicted by the same degree of opacity.

But one black and one white area afford as much information as the sixty-four, and a small square dot of white on a black surface, or *vice versâ*, is even more instructive, in so far as we can more easily observe the phenomena of transition.

In a recent paper in this JOURNAL I have described the more salient of these phenomena, and it will therefore suffice that, for the time being, I recapitulate the following leading facts:—

1. There are only three well-marked types of image developable, viz.—A. Negative. B. Neutral. C. Reversal.
2. Of these three the best-defined—to any one investigating all—is the neutral.
3. Each of these typical forms of image merges by infinitesimal degrees into the others.
4. There is one period of correct, or approximately correct, representation for each type, a period which cannot be either diminished or increased.
5. Consequently, there are no periods of over-exposure or under-exposure, save in so far as there is only one instant from the commencement at which each or any of the three may or may not be obtained.
6. The method of chemical treatment or development can materially alter the ratio between the time of exposure and the amount of density producible.
7. "Halation" is an inherent concomitant of development.
8. "Halation" modifies the "perfection" of all three types of image, but its characteristics can best be noticed in studying the neutral "image" and its congeners.
9. That which I have termed the "inertness" of a developer in density-production seems to be intimately connected with the reflex action of light, which apparently underlies halation.
10. It is very strongly my conviction that the conjoint action of "light" and a "developer" results in the conversion of a part of the formative material, AgBr, into a condition more closely resembling that of "solution" than resembling anything else.

HUGH BREBNER.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

IV.

HAVING in previous articles referred to some of the most important points to be observed in out-door working, I now proceed to offer a few remarks on indoor work, the numerous branches of which form, without doubt, by far the largest share of photographic practice. Among the numerous branches or kinds of indoor work, perhaps the operation of copying first of all merits attention, for under this head we have a very wide and popular branch of photography; and, judging from the numerous queries constantly put forward in the various photographic journals relating to the best means of producing negatives of ordinary black-and-white subjects, such as printed matter, it would appear that a few remarks relating to this class of work would be of interest, at least to those readers of THE BRITISH JOURNAL OF PHOTOGRAPHY having as yet no practical experience of this large and important class of work.

As a general rule, when gelatino-bromide plates are used, the failures which attend beginners in their attempt at copying black-and-white subjects, are nearly always attributable to their inability to obtain sufficient density in the whites, and clearness of film for the blacks, the negatives produced being poor, thin productions, entirely void of the necessary amount of contrast to enable the blacks being printed with sufficient vigour before the high lights begin to veil over.

Among the reasons for such failures may be mentioned, first of all, the employment of an unsuitable quality of plate for the purpose of copying black-and-white subjects.

The employment of a suitable plate is, without doubt, one of the essential points to success in such work, and, without referring particularly to the great advantage which wet collodion affords over a dry plate for the purpose, I propose, in the following remarks, to offer such suggestions on the use of a gelatine dry plate as will enable any one having a reasonable amount of photographic experience to produce black-and-white negatives that very nearly approach collodion.

To those desirous of succeeding in this kind of work I suggest their undertaking the following method of procedure:—First of all, let a really black and white subject to practise upon be obtained, for there is a very great difference in the various kinds of papers and inks which from time to time come before one, all of which are classed under the category of black-and-white, and which at first sight appear, to an unpractised eye, to be so; but, when the same come to be compared alongside such a really snow-white paper and black ink, the difference will be very apparent, many papers will then show a distinctly yellow or buff tint, and which, were it not for the test sample placed alongside of them, might have been judged as good samples of white paper.

The best test subject of a black-and-white character that I know of is produced by taking a pure slab of white matt opal glass. On this may be written or traced with an ordinary pen any suitable design, according to the taste of the worker; but, in any case, it is advisable that, whatever be the design decided upon, such should contain both the finest and fairly broad lines, bearing in mind at the same time that only a suitable ink shou'd be employed for the purpose of making the design to be photographed. For such purposes, perhaps, there is nothing better to employ than a tablet of Indian ink, ground down in water, and then made to assume the consistency of ordinary writing ink, or perhaps a little thicker.

With such, and the employment of a suitable pen, the surface of a purely white matt opal will yield the best specimen of black-and-white contrasts for the purpose of photography that I know of, and such may, with advantage, be kept as a test plate to place alongside any other white surface that from time to time is presented to be copied. So much for a satisfactory subject to practise upon.

The next important consideration is undoubtedly the employment of the most suitable kind of gelatine plate, and for this purpose I have no hesitation in stating that the use of a slow lantern transparency plate is the most suitable, or such plates as England's photo-mechanical will be found serviceable also. Fast or even medium-speed gelatino-bromide plates are not nearly so suitable.

My best black-and-white results have been obtained on England's photo-mechanical and Mawson's ordinary lantern plates, between which there is nothing to choose, both being equally good. There may be other slow lantern plates that will yield quite as good results, but of these I cannot speak from experience, as I always make a rule of sticking to a good thing when I have it.

Another important point in this class of work, and one that I believe is very frequently overlooked, or, in fact, never given any thought whatever, is the employment of suitable apparatus.

In cases where a worker has only a one-lens outfit, and this unfortunately happens to be but indifferently adapted for the work, such a one is labouring under great disadvantages. It is by no means an uncommon practice nowadays, when acquiring a photographic outfit, for the purchaser to select a lens of much greater covering capacity than is necessary for the size of plate his camera is intended for. Thus we find whole-plate lenses used on half-plate cameras, and half-plates on 5×4 and even quarter-plate sometimes.

Now, in copying, in my opinion, the utmost consideration should be given to the employment of not only a suitable camera for the size of plate being exposed, but also no lens should be employed that projects any image beyond the limits of the sensitive plate; or, in other words, lenses that light up the interior of the camera in front of the sensitive plate should never be used where strictly black-and-white negatives are to be produced.

The reason for this is obvious. As a rule, long exposures have to be given to these slow plates, and, when lenses light up the interior of the camera, such plates are always more or less affected by the reflected light from the sides of the camera.

I know long-focus lenses are most useful, under certain conditions of working, when reflections have to be overcome, and at times are essentials, where certain limits as to size of object have to be taken into consideration; but, whenever it becomes imperative to employ such, they should never be used otherwise than on a suitable large camera.

There is a very simple way of detecting when a lens is unsuitable for copying purposes. Let such be focussed on the object giving the exact image required on the ground glass. Now let the focussing screen be turned up, and, by throwing a focussing cloth over the head, and looking into the interior of the camera, it will at once be seen if any rays are being conveyed to the sides, top, and bottom of the bellows; if so, such a camera is too small ever to produce absolutely clear glass for the blacks in this class of work when used with such a lens.

As to exposure. Doubtless, in some instances, when copying such subjects as ordinary photographs, when isochromatic plates are employed, very excellent results are obtained with the aid of artificial light; but, in the case of black and white subjects, and where slow gelatino-chloride plates are used, daylight is almost a necessity, and, with such, an exposure should be given that just dovetails with the particular developer it is intended to employ.

I firmly believe in stopping the lens down, and using strong diffused daylight for the exposure of these plates; practice alone will teach the correct exposure. As a start in this kind of work, a beginner should expose a plate in three sections, ranging from two minutes up to six, according to the stop employed and light available. The old-fashioned method of partially withdrawing the door of the dark cells in three separate distances will on development show which exposure yields the greatest amount of contrast without inducing any degradation of the blacks. To get the most out of a plate exposed in this manner renders it necessary to have recourse to a somewhat protracted development. Once it is ascertained what is the correct exposure for the particular developer employed, the same is known for all time, coming under similar conditions.

In development of these plates hydroquinone is a valuable agent, and, when such is employed in conjunction with a more than usual quantity of bromide of potassium and equal parts of carbonate of soda and carbonate of potash, provided a liberal exposure has been given to the plate, the utmost amount of density and contrast that it is possible to attain on a gelatino-chloride plate will be obtained.

Should the blacks veil over before a large amount of density be obtained in the high lights, the exposure has been too great. Should, after a somewhat long and forced development, only a thin image result in the high lights, but with fairly clear film for the blacks, the exposure is too short, or the subject has been improperly or insufficiently lighted, this, of course, provided the developer is not at fault.

A freshly mixed developer will act with greater vigour than one that has previously been used. An old developer is highly valuable to commence development with, and such may be strengthened to gain the utmost amount of density in the high lights, but the utmost care and attention must be devoted after any such addition to ascertain the moment any degradation of the blacks begins to put in an appearance.

A really perfect black-and-white negative should show no degradation of the lines after development and fixing. When it is seen that the utmost amount of density has been attained by development, and that there has been no degradation of the blacks, everything will go well in the after-intensification of the plate, provided such receive a copious washing before and after the application of the mercuric chloride solution. This may be followed by an application of ammonia or cyanide of silver, the latter yielding the greatest amount of density.

A black-and-white negative produced in the manner I have described, after being intensified and dried will, when held at a distance of ten or twelve inches from the flame of a bat's-wing gas burner, entirely eclipse all light from such, the clear lines, on the other hand, standing out like bare glass, or as clear as gelatine can be be made to yield.

T. N. Armstrong.

THE ART CRAZE.

[South London Photographic Society.]

The establishment of the photographic Salon marked an epoch in our photographic history. Not that the question of art in photography was anything new then. Indeed it has been a controversial subject almost since the days of Daguerre, and is about as old as photography itself. How could the artist, with his brush or pencil, and the engraver with his tools, allow a new method of producing pictures (I use the word in the sense of a representation of an object or scene)—how could he, I ask, allow photography to pass more or less into his realm, his sphere of labour, without challenging its pretensions to artistic result?

For years before the Salon was even dreamed of, the photographic press was flooded with articles upon art and photography. Then arose one man greater than the rest—Emerson; greater than other workers in

his disregard of accepted photographic canons, greater than other writers in the vigour and strength of his writings. He called a spade a spade, and embellished the spade with a wealth of adjective and adverb. For some time he fought alone, but none the less he won the fight, and he stands out to-day as the one man who originated and fostered the artistic side of photography as we now know it.

Strange rumblings of discontent soon followed. A growing feeling that we kept photography in too mechanical a groove, that it was unnecessarily pent up in convention born to a great extent of technique, began to animate the thoughts and actions of a few. Then came the secessions from the Royal Society and the Salon. Why I claim the latter as an epoch is because it marks the point at which the art worker stepped boldly to the front, and endeavoured to prove his argument by results. Prior to this it was a war of talk, of discussion, of wearisome columns in our papers. But now the art worker steps to the front, he not only talks but produces his work, and by means of the Salon challenges those who do not agree with him. The Salon, to my mind, was an honest, straightforward movement to obtain the recognition of artistic photography; and, further, it was the first step of any importance toward that end.

Here let me digress for a moment to say that the title of this paper is not of the happiest kind. In the first place, a very ordinary dictionary reference will show the term "Craze" to be an inordinate or insane passion (Nuttall), to impair the intellect (Webster), and so on. But, like many other words in our most comprehensive language, the meaning has become altered. It now implies a fashion, or mania; in fact, it is something between these two—stronger than fashion, but not reaching a mania. So much for "Craze;" now for the word "Art." You will not expect me to define that. I once asked for a definition, and received the reply, "Art is," to which I rejoined, "Is it?" This matter of terms is referred to because later on I shall show that art photography has largely partaken of the nature of a fashion.

This leads me to a second digression and a confession. Since I gave in the title of this paper, my sympathies have gone over very much to the Salonites, and, as becomes an Englishman, I freely confess it. They have done, and are doing, good service, not only to art, but to photography as well. That is the confession. The digression is, that in most fashions there comes a time when signs of a change are apparent. With the hot-headedness and burning ardour of the enthusiast, the art photographer went too far. He not only wanted the earth, but heaven as well. Whether he applied for the third location I am unable to say. But the fact remains that his enthusiasm overran his common sense. If a photograph was artistic, good; if not artistic, bad. Very simple definitions truly, but utterly absurd and grotesque; it shut out every application of photography, save the pictorial side. I have always held that artistic photography was one branch of a big tree. The art man considered it the whole tree.

I am perfectly well aware how strongly this has been denied, but reference to bound volumes of our periodicals would amply prove my assertion that the art worker of the past made a bold bid for supremacy. His idea was, that the principal aim and sole end of photography was the making of pleasing pictures.

The craze is altering in character, the fashion is changing. Workers in other fields are being recognised, and spoken of with less sneer and less contempt. We are arriving at the common-sense view of the situation. Whilst we admire and praise the work of the man who photographically produces a picture that pleases us, we yet give an equal amount of credit and praise to the worker in quite another field, one in which, perchance, all question of art must be entirely out of the question. Art photography is gradually assuming its correct place as a branch, and, like the tail that arrogated to itself the office of wagging the dog, it recognises that it is not the dog, it is not the whole tree.

Now we come to the question, "Has this art craze done any good?" I say most emphatically, Yes. It has raised the standard of pictorial work, and we have benefited thereby. Technically, good negatives or prints, as such, have no charm. We want something more, some evidence of artistic feeling in the man, some sign that he has made use of the camera, not the camera utilised him, say, to take the cap off the lens for a certain period. Perhaps a little story will best illustrate this. It was a provincial Exhibition, and your humble servant was the Judge. After the awards (or mis-awards) were made, he was button-holed by one of the members.

"What is the matter with my picture?" said he, pointing Number So-and-So out.

"Nothing," said I; "it's very nice."

"Is it over-exposed, or a bad print?"

"No."

"The lighting is all right, isn't it? There's not too much foreground, and the composition isn't bad?"

"Oh, dear, no!" said I.

"But you haven't given it a medal," said he.

"Well," I replied, "what is there in it beyond the fifty others ound?"

"Yes, but, if it has no fault, it ought to have a medal."

"Very well, then," I said, "if you'll let me have fifty medals, one for each of the frames, you shall have yours. But I'm not going to give one to your print only when it is in nowise better than the rest."

This is what the art craze has done for photography, it has made the worker strive to produce something beyond what the camera, lens, developer, and print can do. His own ideas must have play, and the apparatus must be made to serve those ideas. There must be something more than the camera, there must be evidence of the man. We are tired of work produced by a photographic camera, we want the work of the photographic man—in a word, artistic expression.

I expect it will be said that we have had art workers for many years. This is quite true; but they were but few, and they had practically little scope. Who would have dared, ten years ago, to send such pictures to an Exhibition as are now hung at the Salon? You may say, Who would dare even now send *some* of them? and I'll agree. But the fact remains that the efforts of a few workers and the establishment of the Salon have, in the last three or four years, produced a most marked effect upon Exhibitions generally.

In the wake of all great movements for good there follows evil. It is one of the equalising forces of nature, from which even the art craze has not been exempt. The zealot is oft times a fool at bottom; blinded and crazed with the glory of his mission he rushes headlong into the fray, dealing blows with the right hand that the left hand contradicts. He makes his mark in the good cause, but leaves another mark as well, of evil. Prudence and enthusiasm but rarely work in double harness.

We have seen this in photography. We have seen sneers at the scientist, fierce denunciation of process-mongers, sarcasm flung with a generous hand in every direction. We have sat at the feet of our art masters to learn that any knowledge of chemistry or optics is almost fatal to art work, as if, forsooth, a mastery over the tools is detrimental to their proper use. We have been told that the painter does not trouble about the composition of his colours or manufacture of his brushes or canvas; but is it not true that the more he can learn as to the mixing of his colours to attain desired tones and shades, the texture of his canvas and make of his brush, the better? Then why should we not seek, first, to have command over our plates, developers, and prints, so that we may bend them to our will? The art worker will say that his contempt was expressed for investigations such as the action of light, the latent image, the theory of development, &c., not for the command, in actual working, over the tools used. But even this is absurd. It is not necessary that the art worker should trouble his head about these things, but in common justice he should allow credit to those who do. In reality, he is benefiting every day by past scientific research and discovery, and, but for the labours of those he sneers at, would not be in the position he is. This sneering at the scientist and scientific work generally has been the most contemptible feature of the recent art movement. Such a feature can only be the result of fanatical blindness or gross ignorance.

As I have already hinted, I shall not trouble you with pages of extracts to prove these assertions. When I made a rough calculation of the amount of matter I had marked, I found it would take by itself at least five pages of any one of our weekly papers, so you can estimate what the length of this paper would have been. I dropped the idea at once, and have rather jotted down a few stray thoughts that may lead to a fruitful discussion than attempted a full paper replete with extracts and proofs; but, if any one thinks those proofs are not obtainable, it will be an easy matter to disillusionise him.

I have previously referred to fashion. Well, the art craze has been responsible for still another bad feature, viz., fashion. What is the present rage in the way of pictures? The Exhibitions are swamped with swamps, reeling with reeds, marshalled by marshes. The present fashion is a mud-puddle one. It is the day of dreary, dismal, reedy-swamp-marsh-mud puddle, a representation of the wasteful and miserable side of Nature, her sink and cesspool. It is not the representation of beauteous Nature, but the refuse heap at the bottom of her back garden. She screens them from view, but the mud-puddle worker finds them out, and makes them into pictures.

The art craze is responsible for this; it has thrown too much stress upon the making of pictures out of commonplace subjects, with the result that the mud-puddler goes as far away from beauty as he possibly can in order to show how he can improve, by his artistic execution, the rendering of a mud puddle. He searches for stinks to convert them into perfumes,—

> "You can break, you can shatter, the tub if you will,
> But the scent of the butter will hang round it still;"

and the picture conveys to our mind dreariness, dismalness, and darkness. Our Judges at present are rather fostering this; they look too much for ability in the rendering of simple subjects, and overlook the beautiful and artistic, because there is, perchance, evidence of a greater wealth of subject.

Artistic photography is passing through a period of depression. Ere long, perhaps, we may extricate ourselves from the dead waters and dank weeds, to emerge into the light of more cheerful subjects.

The art craze has created fashion in subjects. This means base imitation of one or two successful workers. It is detrimental to art in the highest degree, it prevents originality and induces imitation.

Let us glance at the walls of recent Exhibitions. The effect is everywhere apparent—*genre* pictures, studies of life, and figure subjects have declined in number considerably. Landscape now rules the roost. I confidently assert that the Exhibitions of to-day are not so varied and



TAM O'SHANTER.

Phototype: Society of Graphic Art.
(THEVOZ & CO., *Geneva.*)

Negative by LYDDELL SAWYER.

interesting as those of the past. Who can forget the *genre* studies of H. P. Robinson, John E. Austin, F. M. Sutcliffe, A. G. Tagliaferro, W. Winter, R. W. Robinson, Lyd Sawyer, H. B. Hare, F. C. Lambert, and a host of others? These were happy, cheerful studies, which produced thoughts of the brighter side of life. And now—well, now we have turned to the dismals. I have upon my walls at least two pictures—*Carolling*, by H. P. Robinson, and *When the Day's Work is Done*, by the Rev. F. C. Lambert, which I would not exchange for all the reedy swamp mud puddles in the country. I can look at those pictures to-day with as much pleasure as I did several years ago; they are always pleasing, always refreshing. Shall we be able to say the same of the present style in ten years time?

We therefore arrive at this, that the mission of the art craze has miscarried for the present. Instead of promoting originality, it has produced and furthered imitation.

With a few words upon the Salon again I must draw these remarks to a close, as, in spite of all my care, they are panning out too long. I have praised the Salon and the work exhibited there, but I must also object to the smudge curiosity. I mean those pictures which have to be carefully labelled "this way up," as they look just the same any way. Take Mr. Maskell's prints. He admitted that other people might not like them, but he did, and that was sufficient for him. Possibly so, but that is hardly a pronouncement of artistic merit. I do not fear attacking Mr. Maskell's work, as he expected it would be attacked; and, moreover, he is at least a genial and courteous opponent. So long as I can tell what is meant, it matters very little whether the picture be fuzzy or sharp, but it is really necessary to be able to see whether it is a tree or a ship, a boat on water or a cart on the road. It makes things so awkward. I thought of asking Mr. Maskell what was depicted, but he might have deemed me sarcastic. Be that as it may, I nearly quarrelled with a very intimate friend over Mr. Maskell's blacking-brush smudges. He would have it that the print consisted of a hill, a road, a cottage with a girl outside; whilst my opinion was that it was a ship at anchor beside a huge tree, with a tiny brook trickling towards a big rock.

But, seriously, the Salon has led to eccentricity of the wildest kind. It only seems necesssry to send a picture that no one can understand to have it hung and talked about. I was looking the other night in a household book for a remedy for a blistered finger, and the page opened out at "The Use of Cats' Whiskers." For the remedy I sought consider a pleasing picture, for what I found the smudge of a cat's whiskers upon a piece of paper. The fuzzigraph I will leave alone, the element of personal opinion has legitimate scope here, and each individual picture must be judged upon its merits. I like fuzziness in some cases and sharpness in others; to lay down a rule for one or the other is absurd. But even fuzziness is carried to extremes. There was one picture at this year's Salon that I went back ten yards in my endeavour to get the effect, then thirty yards, and lastly at the end of the room; but I was not satisfied. I next tried it by reflection from another picture, and finally, walking out into Piccadilly and jumping on a 'bus, by the time we got to the Circus I liked the picture. It is one of those I like best when I can't see them.

The old proverb has it that "many persons think they are wise when they are only windy." I must therefore now end up briefly with the assertion that the art craze has done good and evil alike, but the evil stands more chance of diminishing than the good.

WALTER D. WELFORD.

THE EXPLOSION OF AN OXYGEN CYLINDER.

ON Wednesday, March 20, Mr. Langham opened an inquest at the City Coroner's Court, into the circumstances connected with the death of John Holbrook, fifty-five years of age, of 87, Grange-road, Plaistow, who was killed by the explosion of an oxygen cylinder at Fenchurch-street Station, on Friday afternoon, March 15.

The Coroner, before taking evidence, said he had been in communication with the Home Office, and had received an intimation from the authorities to the effect that, with a view to facilitate the arriving at a conclusion as to the cause of the terrible explosion which caused the deceased's death, experiments would be made by an expert, whose reports, however, could not be produced that day.

Mr. Douglas Kennedy, of Plaistow, deposed that the deceased had been in his employ for the past twenty-five years, and had been in the habit of coming to London with a cylinder in order to get it charged with gas. The deceased was sent to London on Friday, March 15, to get a cylinder charged at Messrs. Newton's, in Fleet-street. That was the last time witness saw him alive. The deceased had been cautioned as to the dangerous nature of the cylinder's contents, and the witness had found him at all time a very careful man. He had, moreover, been in the habit of carrying these cylinders for the past two years. With regard to the particular cylinder the contents of which exploded, witness purchased it only three weeks or a month ago, and he produced a written warranty which he received with it at the time, and which stated that the cylinder had been tested up to a pressure of 3300 lbs. to the square inch, and filled with gas up to a pressure of 1800 lbs.

William Perry, a carrier, of Plaistow, said he was at Fenchurch-street Station about 3.25 on Friday, March 15, and, on going upon the down platform, he found it deserted, except that the deceased, whom he had known by sight for some years, was sitting on a seat at the end of the platform, When witness got to within seven or eight paces of him, there was a loud explosion, and witness saw a bright flash, which resembled lightning. The force of the explosion caused him to reel backwards, and he would have fallen but for the fact that he thrust out both arms, and one of them caught against the wall, causing him to fall into a seat which was near.

William Henry Truscott, an assistant at the Fenchurch-street Station bookstall, gave similar evidence. Witness was lifted from his feet by the force of the explosion, and sustained some injury.

James Garrett, foreman porter at Fenchurch-street Station, said he was about thirty yards from the deceased at the time of the explosion. The report was very loud. Replying to a question, witness said that, so far as he knew, there were no regulations prohibiting such cylinders as the one which exploded being carried upon railway platforms or into trains.

George Potter, stationmaster at Fenchurch-street Station, produced a copy of the regulations, from which it appeared that cylinders similar to the one which exploded were only allowed to be carried by passengers after intimation end payment for the said carriage had been made, and a notification given that the cylinders were properly constructed, and had been thoroughly tested. The carriage of these cylinders was charged for at the ordinary parcels rates.

The Coroner: Have you ever detected these cylinders being carried as ordinary parcels?

The witness: Yes, sir.

The Coroner: On many occasions?—I should say one or two a week.

The Coroner: Have you ever stopped a page-boy of Mr. Kennedy's?—I have not myself, but my attention was called to the fact that a page-boy had been stopped last Friday week. In answer to further questions, witness said that, on reference to the books, he found no intimation of a gas cylinder being conveyed on their line on behalf of Mr. Kennedy had been received by them for twelve months.

Inspector McCranken stated that on Thursday or Friday of the previous week a boy of about fifteen entered his office at Fenchurch-street Station and said he had lost his ticket for Plaistow. Witness then observed that the boy was carrying a gas cylinder, similar to the one produced in court. It had no covering, and was suspended by three thin straps. Witness asked him if the cylinder was charged, and he replied, "Yes." Witness asked who had sent him, and he replied Dr. Kennedy, and said the cylinder had been charged in Fleet-street. When asked if he knew what would happen if he dropped it, the boy answered, "It would blow me to pieces."

A youth named Fincher, who described himself as the page-boy of Dr. Kennedy, and was identified by the last witness as the boy referred to in his evidence, caused considerable sensation by emphatically denying the truth of the inspector's statement. He asserted that he was not in London on either of the days named, and was never stopped at Fenchurch-street Station or entered the inspector's office there. He had been to town with gas cylinders for Dr. Kennedy, but had never been to Fleet-street with them. The cylinders he had charge of were always covered, and he was never stopped or questioned, and he carried them in ordinary third-class compartments without objection ever being made.

The Coroner: And do you mean to tell us that what the inspector has stated in evidence is utterly untrue?

Witness: Yes, sir; utterly untrue.

The inquiry was adjourned till Wednesday, March 27.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 5702.—"Improvements in Photographic Cameras." R. LAUDER.—*Dated March*, 1895.

No. 5730.—"An Improved Process of and Apparatus for Producing and Liquefying Acetylene Gas." Communicated by E. N. Dickerson and J. J. Suckert. Complete specification. H. H. LAKE.—*Dated March*, 1895.

No. 5884.—"Improvements in Lamps for Optical Lanterns and the Like." P. P. BURT.—*Dated March*, 1895.

No. 5919.—"Improvements in or connected with Photographic Cameras." C. J. B. ECHASSOUX.—*Dated March*, 1895.

No. 5929.—"Improvements in or relating to Photography." L. F. DOBLER.—*Dated March*, 1895.

No. 5986.—"A Method of Producing Direct Positive Photographic Pictures which may be Mounted upon Cards or other suitable supports, and which may be coloured or otherwise finished." J. A. GIRLING.—*Dated March*, 1895.

No. 6017.—"An Improvement in Sheaths for Photographic Plates." E. UNDERWOOD.—*Dated March*, 1895.

No. 6018.—"Certain Improvements in Change Boxes of Photographic Cameras." E. UNDERWOOD.—*Dated March*, 1895.

No. 6087.—"Improvements in or connected with Magazine or Hand Photographic Cameras." E. H. M. SEYMOUR.—*Dated March*, 1895.

No. 6101.—"Improved Method of Rendering Acetylene and other Gases rich in Carbon suitable for Lighting and Heating Purposes." L. M. BULLIER.—*Dated March*, 1895.

PATENTS COMPLETED.

An Improvement in Photographic Cameras.

No. 4602. E. C. Hawkins, 12, St. Anne's-terrace, St. John's Wood, London, N.W.—*February* 2, 1895.

This invention is for the purpose of readily bringing a series of photographic plates or films one after the other into position opposite a lens for exposure to the action of light.

I provide for this purpose sheaths or carriers to hold the said plates or films, having arms or pins projecting from their lower corners; the said arms rest upon guides or brackets affixed to the inner sides of the camera. The sheaths are pressed forward by means of a spring, the top edge of the foremost sheath being retained by a fixed stop at the top of the camera, the projecting arms or pins engaging in indented wheels, which, upon being wholly or partially rotated, according to the number of indentations, press the arms of the foremost sheath downwards, thereby liberating the sheath from the aforementioned stop, and allow it to drop to the bottom of the camera, the next sheath then advancing into position ready for removal by repeating the operation.

The aforementioned wheels are rotated by other toothed wheels operated from the outside of the camera by a suitable key or handle.

Diaphragms for Photographic Lens Tubes.

No. 462. Max Levy, No. 1213, Race-street, County of Philadelphia, Philadelphia, and State of Pennsylvania, United States of America.—*February* 9, 1895.

This invention relates to improvements in diaphragms for photographic lens tubes, the same being especially designed for use in the production of half-tone photo-mechanical engravings, the improvements relating particularly to the means for producing a negative through a cross-line grating or screen.

The object of the invention is to provide the lens tube of photographic cameras with slides for forming a diaphragm, the aperture of which may be varied as to size, and with additional or supplemental slides for altering the configuration of the aperture, means also being provided for blocking out the central light, the construction being such that the slides which form the diaphragms are adjustable for giving any size of rectangular aperture that may be required, and with or without extensions at the corner thereof.

The invention is based upon the fact that, in making a so-called half-tone negative through a cross-line screen, the effect is to produce upon the sensitive plate through each aperture of the screen a perfect reproduction of the aperture in the diaphragm through which the light is admitted, and in practice it can be demonstrated that there are many instances in which the diaphragm with a square aperture will not give the best results; and this is notably the case where the subject to be reproduced has relatively high lights and light shadows, or, as commonly expressed, the subject is flat and wants contrast or brilliancy, and in such cases I provide means for extending two or four of the corners of the square aperture, these extensions being very small as compared to the main aperture, and the light transmitted through them in an ordinary exposure is sufficient to produce, in the highest lights of the subject, an action which will respond to the subsequent processes of intensification. In effect, the result is somewhat analogous to the use of a diaphragm with a small round aperture for the general subject, and a larger aperture for the high lights, but it will be noted that the light admitted by the excess of the aperture will fall only between the intersections of the opaque lines of the screen, thus greatly exaggerating the tendency to form the dots without undue loss in the sharpness of the lines. Still further, if a diaphragm with an aperture of proper size as related to the distance between the screen and sensitive plate, and having the central light blocked out, be used for a part only of the entire exposure, the light admitted through the multiple aperture can be made to fall on the sensitive plate, only on those portions between the intersections of the black cross lines, and the highest lights may be in this way almost entirely acted upon without detriment to the other parts of the picture.

In practice, in dealing with subjects of greatly varied character, it is often found desirable to change the character of the aperture during the progress of a single exposure. My invention can be successfully applied in a variety of ways, all of which are essentially dependent upon the same factors: First, that the diaphragms are so constructed that the aperture produced thereby can be varied in size; second, that the character of the aperture can be varied by changing the configuration thereof; third, to provide a diaphragm in which the central light may be blocked out so as to provide a plurality of apertures; and that these factors be used singly or in varied combinations.

The claims are:—1. A diaphragm for photographic lens tubes provided with means for producing a rectangular aperture with extensions at the corners thereof. 2. A diaphragm for photographic lens tubes provided with means for producing a variable rectangular aperture with variable extensions at the corners thereof, for use in the production of half-tone negatives. 3. In a photographic lens tube, the combination of a plurality of slides having straight edges which terminate in a step, means for adjusting said slides to and from the centre of the lens tube to provide a variable aperture with extended corners. 4. In a photographic lens tube, the combination of a diaphragm having a central aperture, of arms or bars adapted to be moved across the aperture to block out the central light. 5. In a diaphragm for photographic lens tubes for use with a grating, the combination of slides which together form a rectangular aperture, similar slides arranged adjacent thereto for varying the configuration of the aperture. 6. In a diaphragm for photographic lens tubes for use with a grating, the combination of slides which together form a rectangular aperture, similar slides arranged adjacent thereto for varying the configuration of the aperture, and arms adapted to be swung across the aperture to block out the central light therefrom. 7. A diaphragm for photographic cameras having two sets of independently adjustable slides to produce an aperture with different characteristics, the slides being movable to increase and diminish the size of the aperture, the means for adjusting the slides being provided with scales from which can be read the size and configuration of the aperture. 8. In a lens tube for cameras for use in the production of half-tone negatives, the combination, of a casing having pinions which mesh with a ring having teeth on its inner edge, said ring being connected to adjusting means for the same of a plurality of slides having rack bars which mesh with the pinions as shown, whereby the slides are moved in unison to or away from the centre of the casing, for the purpose set forth. 9. In a lens tube for use with a grating or screen in the production of half-tone negatives, the combination of a diaphragm having a rectangular aperture, the sides of said aperture being arranged at an angle with the lines of the screen so that a line drawn from one corner of the aperture to the other would be substantially parallel with the lines of the grating.

Improvements in Photographic Flash Lamps.

No. 7536. Henri Alphonse Keys, 17, Apsley-road, Walthamstow, Essex. *February* 9, 1895.

A magnesium flash lamp for photographic purposes, consisting of an oval tin box, with more than one wick, and a certain number of small tubes so placed that the magnesium, when blown through such tubes, would give a wide-spreading flame.

News and Notes.

The Imperial Dry Plate Company, of Cricklewood, have issued a handbook of Imperial plates, papers, and films. Many useful hints on developing the sensitive productions of this well-known firm are given in the handbook.

The old-established house of W. W. Rouch & Co., which, for many years past, has been located at No. 180, Strand (corner of Norfolk-street), has recently removed a few doors further westward, in the same thoroughfare, to No. 161. The new premises of the firm are situated at the entrance to King's College.

We are sorry to learn of the death of Mrs. Bridge, wife of Mr. F. A. Bridge. The deceased lady passed away on Tuesday morning last, after only three days' illness. She was well known to a past generation by her maiden name of Miss Elizabeth Stirling, and, besides being an accomplished organist, was the composer of many part songs, including the ever-popular "All Among the Barley."

New Camera Club.—A meeting was held at Wheatland, Windermere, on Tuesday, the 19th inst., at which it was decided to form a club called "The Lake District Camera Club." The following were elected officers:—*President:*—Mr. J. R. Kidson, C.C., J.P.—*Vice-Presidents:* Messrs. R. M. Dunlop, M.A., J.P., Paul Lange, and G. H. Rutter.—*Hon. Treasurer:* Lieut.-Colonel Reade.—*Hon. Secretaries:* Mr. W. H. R. Kerry, F.C.S., Wheatlands, Windermere, and Mr. Fred. B. Cattley, Hazelwood, Windermere.

Two workmen in the electrical department of the G. P. O. were on Tuesday, last week, examining the over-night entries in a book notifying defects to the electric clock, when they heard a hissing noise from a four-gallon jar of sulphuric acid. Before they could remove the stopper the jar exploded, and the fumes rendered both unconscious. Two of the staff doctors immediately attended the men, and when brought round they were sent home in cabs, but one, a married man with four children, has since died.—*The Sun.*

Mr. Alfred Maskell writes us from St. Raphael, Var: "I leave Marseilles on Monday for a month in the Mediterranean, visiting Athens, Constantinople, Cairo, and other places. My British Journal of Photography follows me, and will pick me up at various *postes-restantes*, I hope; but in this charming climate, with the eye and mind soothed and refreshed with the delightful scenery and play of colour, one is inclined to look more condescendingly upon the sanities or insanities of naturalistic pugilism and to think that a little rest amid groves of palm trees and umbrella pines, and under the ever-brilliant sunshine, might moderate the spleen even of our friend Apς. *N'est-ce pas?*"

Camera Club Photographic Conference, 1895.—President, Captain W. de W. Abney, C.B., R.E., F.R.S. Tuesday, April 2, four p.m. to six p.m. and eight p.m.; Wednesday, April 3, four p.m. to six p.m. and eight p.m. Papers to be read at the Camera Club: Captain Abney, Title of subject not yet announced, will appear in printed programme. Mr. H. E. Armstrong; *Considerations suggestive of Experiments on the Changes attending Exposure and Development.* Rev. F. C. Lambert, *On Criticism.* Dr. Hall Edwards, *On the Correct Rendering of Colour Values by Photography.* Mr. Roland Briant, *Photography and Decoration.* H. Dennis Taylor, *Telescope Star Images in relation to Vision and Photography.* Also probably papers by Mr. A. Pringle, *Instantaneous Photo-micrography.* Messrs. Cross & Bevan, Subject not yet announced. On Monday, April 1, at three p.m., there will be the opening private and press view of the Members' Annual Exhibition in the Club. Thursday, April 4, half-past seven p.m. Annual dinner for members and friends at the Monico Restaurant, Piccadilly-circus. Monday, April 1, eight p.m. Exhibition of lantern slides at the Society of Arts (by kind permission of the Council). Special tickets required in all cases for this exhibition.

The Rothesay Collotype Company.—Mechanical printing grows in demand daily, and he who is earliest in the field has every chance of meeting anticipated wants, and creating for himself a business on the new lines. Messrs. J. Adamson & Sons, Rothesay, whose new factory we visited the other day, have evidently taken this view of the subject, and, under the name of The Rothesay Collotype Company, they have built and fitted in a very complete form premises for the manufacture of prints by the collotype process. The position of the firm as photographers is well known, standing as they do in the front rank of the profession. From the portrait business they have for some years been extending and giving considerable attention to the marine department of photography, until, as publishers of yacht and shipping pictures generally, they hold the first place in Scotland. The demand for this class of

work so grew upon them that they had to give out large orders for collotypes to be done for them in London and elsewhere, as ordinary silver printing could not in any way meet the demand, and even with the assistance of developing papers, such as bromide, &c., they could not overtake their orders, so they resolved to build and fit a collotype factory, which has been done in a very perfect manner. In the printing room two Furnival presses are kept at constant work. The room itself is some thirty feet square, with a small apartment adjoining, where the gas engine is fitted. The rooms for preparing the plates and drying and finishing them ready for the printing press are on the same floor, and are fitted with the latest appliances to facilitate work. On the floor above are the enlarging rooms, where all the various forms of work are manipulated and made ready for the printers. Arrangements for day and artificial light, cameras, and lanterns, are here fitted up for enlarging and reducing, these being of the latest construction and very complete. We saw orders being executed for pictures 24×18, for shipping and advertising purposes, down to one inch square for note-paper headings, also a series of ministers' portraits—12×10 pictures, printed with tinted margin—of a very fine finish, showing no grain. The variety of illustrated work that comes to hand proves that the being able to supply in a great measure creates the demand for such things as small guide-books illustrated, menu cards, advertising sheets, &c.; and so fast has the work come upon them that the Company are seriously contemplating an extension of premises. It looks as if their success in this new departure were assured.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
1–4	Camera Club	Annual Conference.
1	North Middlesex	
1	Peterborough	
1	Richmond	Lantern Evening.
1	South London	
1	Stereoscopic Club	
2	Birmingham Photo. Society	
2	Bolton Photo. Society	
2	Brixton and Clapham	
2	Exeter	
2	Hackney	*Preparing Negatives for Printing.* S. J. Beckett.
2	Herefordshire	
2	Lewes	
2	Munster	*Printing Papers.* W. M. Smith.
2	North London	
2	Oxford Photo. Society	
2	Paisley	
2	Rotherham	
2	Sheffield Photo. Society	
2	York	
3	Croydon Camera Club	Council Meeting.
3	Edinburgh Photo. Society	
3	Leytonstone	
3	Midland	*The Dark Room and its Arrangement.* H. Cooper.
3	Photographic Club	
3	Southport	"*C.C.*" *Paper.* J. S. Dickin.—Exhibition of Lens Fittings by Messrs. Taylor, Taylor, & Hobson.
3	Southsea	
3	West Surrey	*A Photo-micrographic Gossip.* T. Charters White, M.R.C.S.
4	Birmingham Photo. Society	
4	Dundee and East of Scotland	
4	Ealing	Lantern Evening. Tom Bright.
4	Glasgow Photo. Association	
4	Glossop Dale	
4	Hull	
4	Leeds Photo. Society	*Photography and Fine Art.* W. Howgate.
4	London and Provincial	
4	Oldham	
4	Tunbridge Wells	
4	West London	Social Technical Meeting.—Outings.
4	Woodford	*A Few Remarks on P.O.P.* F. E. Emler.
4	Woolwich Photo. Society	*Platinum Toning.* A. C. Baldwin.
5	Brighton and Sussex	
5	Cardiff	
5	Croydon Microscopical	
5	Holborn	
5	Leamington	
5	Maidstone	
5	North Kent	
6	Hull	
6	Liverpool Amateur	Exc.: Rossett and Gresford. [Leader, H. Holt.]

ROYAL PHOTOGRAPHIC SOCIETY.

MARCH 26.—Technical meeting,—Mr. T. R. Dallmeyer (Vice-President) in the chair.

A number of lenses of ancient and modern construction were on view, lent by Messrs. J. H. Dallmeyer, Ross & Co., Chapman Jones, Goerz, and others.

On the invitation of the Chairman, Mr. W. E. DEBENHAM gave a brief description of the photographic lenses constructed anterior to 1860, commencing with the single lens made by Chevalier for Daguerre, the portrait and orthoscopic lenses of Petzval, Sutton's triplet, &c. Next passing to lenses of a later date, he referred to the necessity felt for including a wide angle of view and described the Harrison Globe lens, mentioning its proneness to give a flare spot, Grubb's aplanat, the Dallmeyer & Ross triplets, Steinheil's aplanat, the Dallmeyer single lenses, Steinheil's periskop, &c.

Mr. H. CHAPMAN JONES described a Harrison Globe lens he had lent. This was of seven inches focus, and covered a light circle of ten and a half inches diameter, so that it was not a wide-angle lens. The definition with the largest aperture, *f*-17, was none too good. Mr. Chapman Jones also spoke highly of some old Ross single lenses he had in his possession as giving far superior definition to modern cheap single lenses.

The CHAIRMAN exhibited the latest lens made, viz., the four lens doublet of Zeiss, which was stated to possess great flatness of field combined with the power of working at *f*-6·3. In the course of further observations, he remarked that the evolution of lenses of the rapid rectilinear type could be traced to Steinheil's periskop.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 21,—Mr. H. Snowden Ward in the chair.

Mr. Thomas Bedding passed round several examples of ceramic enamels, by Cherrill's process, referred to at a previous meeting, which had been kindly sent by Mr. H. P. Robinson.

A question from the box asked what was "hydro-oxygen" gas, which had been referred to as the compound concerned in the recent explosion?

Mr. A. HADDON doubted whether hydrogen and oxygen were ever compressed in the same cylinder knowingly; nitrogen and oxygen, however, were. (Laughter.)

COLOUR PHOTOGRAPHY.

The remainder of the evening was devoted to a discussion between Mr. E. J. Wall and Mr. W. T. Wilkinson with reference to some disputed points as regards the action of screens in colour photography.

Mr. WILKINSON said: I will just begin with part of Mr. Wall's paper, and I should like to say that anything I have written on this or any other subject is quite right, and I have tried methods mentioned in the papers, and got no result, so I determined to work it out my own way, and the result is here. The print is done in the litho hand press. It is not the best, as the friends to whom I have shown them begged or borrowed the copies, and have not left me the best. I should just like to remind you it was shown here a little over twelve months ago—the very same thing. I also show you three prints from three negatives from nature, and would further say that these also were shown twelve months ago. On the back is written the plate that they are for, and I think, if you examine them carefully, you will find that the red one is correct. Mr. Wall was kind enough to observe that my article was misleading. To this I would reply that I never say anything which I have not proved, and the experiments are quite open to Mr. Wall to try. I say this: For each picture choose a screen and then your colours. Mr. Wall says it is absurd that each picture has a spectrum of its own. I say that it is absurd to say different. As a proof of what I say, I show a set of little prints which are all different, and no one screen will get them entirely alike. I may say there are five yellows, and one is not marked. No one screen will get them entirely alike. About three years ago I prepared a series of lantern slides from a lot of negatives I had. I lent them to a friend, and I applied for them to bring here to-night, but my friend is laid up with influenza, and I cannot get them, but when he is better I will bring them down. Now I will just pass round two sets of three, and you will have no difficulty in finding which is which. Here is another set from an oil painting. In the little picture of the bunch of flowers you will see the red plate is wanting in detail, and the reason is, it was done in Manchester, and in Manchester, the same as in London, a fog often comes down and stops the work.

Mr. WALL said: On February 7 I read a few remarks on *Colour Photography*, and in the course of that paper I referred to an article by Mr. W. T. Wilkinson. The following are the actual words I used:—"It has been said, gentlemen, that the London Provincial is famous for fighting, and I am going to give somebody a chance now to turn up his coat sleeves and fight, if he can." In THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1895, p. 655, Mr. W. T. Wilkinson says: "Up to the present the stumbling-block in the way of the ordinary experimentalist is having to sensitise the films, which is a very ticklish operation, but the drawback is largely discounted by Fuerst Brothers' introduction of Lumière's colour-sensitive plates, so that the process can be tried by any one, the yellow plate being made on an ordinary slow plate, interposing a red screen; the blue plate on a series A Lumière plate and a yellow screen; the red plate on a series B Lumière plate and a green or blue screen. Another plate is promised, sensitive to the yellow, green, and red, which will still more help on the work. The screens used are very important, but it is no use confining oneself to the commercial set of three, because every picture wants its own peculiar set; a full set of screens are about twelve to fifteen, made up of four or six yellow, five or six red, and three blue. They are not expensive or difficult to make, being merely aniline dyes dissolved in collodion, with which squares of colourless patent plate are coated. These screens may be just large enough to cover the back of lens, or better still the full size of plate, and placed in contact with the sensitive surface." The phraseology of this is a little loose, and therefore one hardly knows what he does mean. He says, "The yellow plate being made on an ordinary slow plate interposing a red screen." From the context he evidently means that to make the negative from which the yellow printing plate is prepared, an ordinary slow plate and a red screen is used. Now an ordinary slow plate is insensitive to red and yellow, and only sensitive to violet, blue, and blue-green, and yet a red screen is used which cuts out the very colours to which the plate is sensitive, and only allows those to pass to which the plate is not sensitive. I venture to say that the result would be nil. He then goes on to say that "the screens used are very important, but it is no use confining oneself to the commercial set of three, because every picture wants its own peculiar set; a full set of screens are about twelve to fifteen, made up of four or six yellow, five or six red, and three blue." This is totally misleading, and having once determined on your screens and inks, you can master any original presented to you. If Mr. Wilkinson is right, the *reductio ad absurdum* which is perfectly legitimate, is that every original has a spectrum of its own, and this, and not

the ordinary spectrum, which most people work with, has to be considered. Mr. Wilkinson has said that he showed the results of work and experiments; he was not satisfied with what had been written, and the consequence was he went to the root of the thing. He also said that I said the proper way to work was to choose the printing inks. I did not say that. I said the easiest way was to get the ink and the proper screens to cut them out. He also said that I had slap-dash screens, chosen in a glass shop. Mr. Wilkinson says, further, that each picture has its own spectrum. Well, hitherto, I must confess, I always thought we had one spectrum, and that a picture or object partially absorbed the solar rays and reflected others. Mr. Wilkinson handed round prints which he said had a certain number of yellows. All the yellows must be formed from the spectrum. Now, I have one other little point which I think I am perfectly justified in bringing up."

Mr. Wall then went on to say: "Curiously enough, the very next week I received the exchange number of Wilson's *Photographic Magazine* for February, and there, on page 79, is an article by Mr. W. T. Wilkinson on "Elementary Colour Photography." I naturally read this with interest and avidity, and was astounded to find some most extraordinary statements in it. I have endeavoured, as far as possible, to work as Mr. Wilkinson describes, and in most cases with totally different results. I have carefully examined the screens in a more precise manner in a two-prism table spectroscope with different results to what Mr. Wilkinson obtained. He (Mr. Wilkinson) says: "The dyes were each dissolved in plain collodion, with which small squares of white patent plate were coated, the strength of the dye in each case being as high as possible to obtain a perfectly transparent film, *i.e.*, if more dye had been added, the film would have dried semi-opaque instead of transparent." Mr. Wall stated that he had obtained seven of the dyes named by Mr. Wilkinson, and he would practically test before the members their action on the spectrum. "(1) Chrysoidine. This cuts off the blue from E to G, leaving to rest of the spectrum intact." Mr. Wall showed that this dye cut off from D½E to H. "(2) Fuchsine. This is very peculiar in its action, and it blots out the *whole* of the visible spectrum, and then reveals the infra red and ultra violet, both of which are quite invisible directly the fuchsine screen is withdrawn." The action of this dye in one or more thicknesses of screen was practically shown to cut of from about B½C. No ultra violet or infra red was rendered visible. "(3) Aurine cuts of the yellow entirely, leaving blue and red normal." Aurine was shown to cut off in one thickness from E to H, or D½E to H in two thicknesses, that is to allow the yellow to pass, but cut off the blue and violet. "(6) Fluorescine cuts off from F to half way to H; yellow is brighter, red grey." This was shown to cut off from E to H and allowing the red to pass in its normal state. "(8) Coralline cuts of everything from C to H." This was shown to cut off from D to H in one thickness, in three thicknesses from D½C to H. "(9) Malachite green cuts off from A to D, leaving rest of spectrum untouched." This was shown to cut off from B½C to E, and from G to H, leaving a band in the red and from E to G. "(10) Naphthalene red, A to D and F to H quite untouched, the remaining portion of the spectrum being a beautiful green." The screen prepared with this dye, and which was made by Mr. Wilkinson, was proved to dampen the yellow considerably and the spectrum generally, but to allow light of all colours through, thus proving Mr. Wilkinson's statement as to the formation of his yellow negative to be erroneous, as naturally the blue and violet would act on the plate, and not the yellow and red, to which it was sensitive. We have got hold of the screen which Mr. Wilkinson uses, and that allows the rays to go through. He gets the result, of course, but it is a representation formed by the blue rays. What I contend is that an ordinary plate is not sensitive to red and yellow, and Mr. Wilkinson has used a red screen, which ought to have cut out the blue and violet. We have tested the screen, and it allows a lot to go through. Mr. Wilkinson says it is not a proper spectrum to work with. I admit that, and, if the solar spectrum were used, it would allow a lot more blue and violet to go through. He says naphthalene cuts off the blue and violet, and it does not.

The CHAIRMAN: There is one point which I think Mr. Wilkinson has not touched on, and that is each picture having a separate spectrum.

Mr. EVERITT: It shows that the word spectrum is used in rather a loose way. When we speak of a spectrum we mean from the ultra red to the ultra violet. And you say that is a spectrum of that particular colour, but you have that colour for that substance, and you speak of that as a spectrum. As far as that particular subject goes, therefore, it shows that that word is used in two senses instead of one.

Mr. WALL: I think that Mr. Everitt is wrong. Here is a very good colour chart. Will Mr. Everitt tell me that the colours there are not solar spectrum rays?

Mr. EVERITT: I mean we speak of part of the colours as a spectrum, and we speak of a spectrum when it refers to the whole of the colours.

Mr. HADDON: One is as perfect a spectrum as the other. Each substance has its peculiar colour, but it is a spectrum. It is only when you have a white hot body that you get a continuous spectrum.

Mr. DEBENHAM: The colours we see are all representative of different parts of the solar spectrum. They may be true representations of them. The whole object of colour-sensitiveness for plates is to sensitise plates for special parts of the solar spectrum. In the ordinary way they are sensitive only to the blue in the spectrum. Ordinary plates are sensitive to the visible rays of the spectrum; so that, if we can by any means reduce each part of the spectrum to its proper value, I cannot see why we should have a different set for another picture. I cannot see why we should want to modify these for different subjects, except if we only want to get a separate colour. Whether red is entirely absent, I do not see we should get it any better if we get a set of screens which give us the spectrum throughout.

Mr. EVERITT: Does Mr. Wall find that by modifying his screens for two pictures that he obtains better results in either case, or does he find that he obtains the best results in either case by using one set of screens?

Mr. WALL: If you can get your screens so that they will give you on your negative a solar spectrum of your negative—one red, one yellow, and the other blue—you are able to photograph any mortal thing you like.

Mr. EVERITT: Have you such a set of screens?

Mr. WALL: Pure spectrum screens. You have got to take into consideration the sensitiveness of the plate.

Mr. EVERITT: But does Mr. Wall find that in practice he can with the same set of screens obtain the very best results, or could he by modifying these screens find better results?

Mr. WALL: I state very quietly and emphatically that with one set of screens you can get the best results for one, two, four, or four million pictures.

PHOTOGRAPHIC CLUB.

MARCH 20,—Mr. G. A. Wilkes in the chair.

The Hon. Secretary showed three prints on Barnet platino-bromide paper developed with metol. These were pronounced excellent.

THE BURSTING OF AN OXYGEN CYLINDER.

Mr. BRIDGE asked if any one had seen the report of the inquest on the victim of the cylinder explosion at Fenchurch-street station.

The HON. SECRETARY, reading from the *Globe*, said that the matter was adjourned; the Home Office had the subject in hand.

Many of the members remarked on the absurd theories put forward as to the cause; one could not be much more absurd than the one that the victim had just lit his pipe, which caused the accident.

The question of packing cylinders for transit was raised.

Mr. FOXLEE said that carboys stood a lot of knocking about, and they were packed in wicker. It was durable and very elastic.

Mr. TOTTEM suggested that at least one-inch wood cases should be used, lined with a jute fender.

Mr. BRIDGE said that he had suggested such a mode at a London Chamber of Commerce inquiry, but one gentleman present said that it was difficult enough to get customers to pay carriage on cylinders, and they would strongly object to the extra weight of the wood. Economy was more important evidently than safety.

The CHAIRMAN remarked that it would restore confidence amongst users of cylinders if it was known how many accidents had happened within recent years, and how many cylinders were now in use.

Mr. TOTTEM said that he was pleased to be able to say that Mr. Bolas had told him that during the last forty years there had been, so far as he could find, only about thirty accidents with cylinders. The fact was to be borne in mind that cylinders formerly and now made were of very different manufacture. He could not say how many cylinders were in use.

Mr. BEDDING said he believed that during the last six years there had been only four accidents with cylinders.

Mr. WILLIAMS asked if Brin's would fill a twenty-feet cylinder with ten feet of gas.

Mr. R. A. HODD said that Brin's would *not*. They only filled to a standard pressure, viz., 120 atmosphere.

The CHAIRMAN suggested a Government inspection and marking.

Croydon Microscopical and Natural History Club (Photographic Section).—The last lantern exhibition of the season was given on Friday evening last by this Society before a good attendance of members and friends. Over one hundred slides were passed through the lantern, whish was under the direction of Mr. J. H. Baldock, F.C.S., Lanternist to the Society. The slides were contributed exclusively by members, and comprised sixteen views of Ilfracombe and neighbourhood by Messrs. Grundy and Baldock. Twelve exceptionally fine photo-micrographs of vegetable tissues by Mr. J. Packham; seven architectural views in Oxford, and twenty-seven fine views in North Wales by Mr. C. F. Oakley; thirty very fine subjects of Canterbury and its Cathedral, by Mr. A. P. Hoole, of Sutton; and sixteen views in various parts of the County of Surrey, by Mr. J. H. Baldock.

AT the annual meeting of the Club, recently held, the following were elected:—*President:* Mr. W. Murton Holmes.—*Secretary:* Mr. R. F. Grundy. The members of the Photographic Sub-committee being Messrs. J. Weir Brown, J. H. Baldock, F.C.S. (*Lanternist and Recorder*), H. D. Gower (*Hon. Secretary*) C. F. Oakley, A. Roods (*Librarian*), and C. H. B. Sparrow.

Putney Photographic Society.—March 21, Mr. H. Faulkner in the chair.—Mr. G. E. MARTIN (a member of the Society) gave an account of a voyage to New Zealand, and fully illustrated it by 150 lantern slides. Starting from Tilbury, the following places were touched: Plymouth, Teneriffe, Cape Town (with some striking slides of Table Mount and Lion Rock), Hobart, Port Chalmers (New Zealand). Here he transhipped to another steamer, calling at all the principal ports on the east coast to Auckland, showing photographs of the largest cities, giving the chief features of each. The slides that illustrated the many curious and interesting sights to be found in the "hot lakes," district and accompanied by a short but a vivid description, gave one as realistic an idea of them as was possible without their brilliant colouring as described by the lecturer. At Tikitere, where are situate "Hell's Gates" and the "Inferno" (two vast caldrons of furiously boiling mud), the interest centres in their awful appearance and the suffocating fumes of dense clouds of steam that are perpetually rising from them. The ground here trembles, and there is a ceaseless roar from the boiling contents, the strong sulphurous steam turns silver watches and coins black in a short time. The lecturer described and showed slides of various hot lakes, springs, mud volcanoes, and natural hot baths, these latter being very beneficial for certain complaints, such as chronic gout, rheumatism, &c., and vary greatly in their chemical composition. The Maoris utilise many of the boiling pools for washing and culinary purposes, and often cover up a steam jet with boards and sacking, thus forming an excellent substitute for an oven. During part of the journey in a four-horse coach, some splendid "bush" scenery was passed, the tree ferns nearly meeting over-

head along the road. A few slides illustrating a "Tangi" (or Maori funeral ceremony), which the lecturer had the good fortune to witness at Ohinemuter were very interesting, this ceremony lasting for two days, during which period feasting, drinking, dancing, wailing, singing, and orations were its chief features, and freely indulged in, several Maoris coming from villages far around, as the deceased was a person of some importance. The Government House at Wellington is notable for being the largest wooden building in the world. On the homeward journey, *viâ* Cape Horn, the lecturer took some good snap-shots of some icebergs of vast size, and also of a "sea of ice." He was, unfortunately, prevented from landing at either Rio de Janeiro (the finest tropical city) or Teneriffe; the former on account of the fighting between the insurgent fleet and the Government, and the latter place because the cholera was raging in the Canary Isles, and could only take snap-shots from the ship. He was not, therefore, sorry to step again on *terra firma* on arriving at the old country.

South London Photographic Society.—March 18, Mr. Mark Boxall, Treasurer, in the chair.—Mr. W. D. WELFORD read a paper on *The Art Craze* [see p. 199], which was followed by a discussion in which Messrs. Boxall, Moss, Oakden, Slater, and others took part. The annual meeting of the Society will be held on April 1, when the election of officers for the ensuing year will take place.

West Surrey Photographic Society.—The Seventh Annual Exhibition of members' work was held at the Public Library, Lavender Hill, on March 18-20. Although the exhibits were small in number, the average work was decidedly good, the Judges (Colonel Gale and Mr. F. S. Murray) finding it hard work to apportion the awards. Mr. W. Winsford took first place with *The Calm Sweet Hour*, a very pretty little landscape taken on a local common. Amongst other pictures by this exhibitor were *Pass of Llanberis*, and some flower studies. Mr. G. H. Seward came second with one of his pictures which had been entered for the "Brook" competition. *The Arctic Thames*, by Mr. P. A. Martin, was awarded third place, and from the exhibitor three pictures "not for competition" drew forth much admiration. Mr. S. Wenman was fourth with a *Ploughing Scene*, and he also showed the pictures with which he won the "Brook" competition. Miss Winsford, notable as the first lady member who has taken an award, was fifth with a pretty little landscape. Amongst other exhibitors might be mentioned Mr. J. Bull with carbon views of *Burnham Beeches*. Mr. G. H. James, a series of carbon prints "not for competition," prominent amongst them being *A Forest Mirror*. Colonel Gale also lent some views to add beauty to the walls. During each evening there were two lantern exhibitions, slides being lent by Colonel Gale, Messrs. P. A. Martin, Bond (zoological series), Charters-White, Bull, and the Hon. Secretary, which were much appreciated by a numerous attendance of visitors. This Society now numbers fifty-three members, and is still growing.

Bath Photographic Society.—March 13, Mr. Aug. F. Perren (President) in the chair, when Mr. G. NORMAN gave his promised lecture, *The Photographers' Convention, Dublin*, 1894, in which he was assisted by Mr. Geo. F. Powell and Mr. E. J. Appleby. The latter gentleman also exhibited the views by means of the optical lantern. The lecturer commenced by paying a graceful tribute to the Photographic Society of Ireland for the energy they displayed in providing amusement of a photographic character for their guests. He understood a fund of over 500*l.* was raised by the local Committee for this purpose, and everything that could be done to make the visit of the Convention a success was unremittingly attended to. Four members of the Bath Society were present, and he had no doubt quite a plethora of pictures made at the excursions had been brought back. A selection of these would be shown, and he proposed to say a few words as the pictures were presented. The journey from Bath to Dublin was briefly sketched, the starting point in the illustrations being the Custom House and its busy surroundings, then followed the General Post Office, the Bank of Ireland (once the Houses of Parliament), Christ Church, and St. Patrick's Cathedral, the O'Connell Bridge, O'Connell statue, street scenes, &c., all of which subjects the lecturer dwelt more or less upon in proportion to their significance and general interest. Then followed views of Kingstown Harbour and Killiney, where the Lord Mayor gave a garden party to commemorate the visit of the Conventioners. One day's excursion was devoted to visiting Monasterboice, with its round tower and crosses, Mellifont Abbey, the Valley of the Boyne, and Drogheda. The lecturer then gave some interesting particulars of Howth, the Abbey, &c. Powercourt's House was next visited, and several views of the buildings and its beautiful grounds were shown, as well as the waterfall, and others at the glen of water-slide. The final excursion was to Glendalough or the valley of the seven churches—although, said the lecturer, there are more than seven. Wherever possible, interior and exterior views of the same edifice were shown and the chief architectural and archæological features of the subject explained. The lecturer spoke for nearly two hours, and gave over a hundred illustrations of Irish scenery. The CHAIRMAN cordially thanked the lecturer for his very able description of the doings of the Convention. He also thanked Mr. Powell and Mr. Appleby for the part they had taken in the evening's entertainment. He felt sure there would be a good muster from Bath at the next Convention meeting, to be held at Shrewsbury in July.

Derby Photographic Society.—March 19, Mr. G. Walker presiding.—Four new members were elected, viz., Messrs. Bell, Bowler, Barnsley, and Smithard. Mr. H. PICKERING (Hon. Secretary of the Leicester Photographic Society) was next called upon to give a demonstration on the *Collotype Process*—a process which was evidently well understood by Mr. Pickering. A vote of thanks was accorded to him for his kindness in coming from Leicester. A Social Evening will be held on April 3, to which members and friends are invited.

Stockport Photographic Society.—March 15.—Mr. ARTHUR C. BALDWIN, of the Eastman Photographic Materials Company, London, gave a practical demonstration on *The Development and Toning of Eastman Bromide and Nikko Papers*, and showed what splendid results can be obtained on such. Mr. Baldwin also showed and explained the Kodak and Kodet cameras, and a very pleasant and instructive evening was spent, and the best thanks of the Society were accorded to Mr. Baldwin for his excellent demonstration, which was greatly appreciated by the large number of members present.

Glasgow and West of Scotland Amateur Photographic Association.—March 18.—Mr. DONALD DOVE exhibited a series of 100 lantern slides, taken during a journey of 300 miles on horseback through the Thermal District of New Zealand, and gave a most interesting description of the volcanic phenomena and scenery of that wonderful tract of country.

FORTHCOMING EXHIBITIONS.

1895.		
March 29, 30	*Brixton and Clapham Camera Club.	F. W. Levett, 11, Corrance-road, Brixton, S.W.
April 15, 16.....	*Beverley.	T. J. Morley and A. W. Pickering, Toll Gavel, Beverley.
,, 30–May 4	*Eastbourne.	J. J. Hollway, 11, Hyde-gardens, Eastbourne.
May 6–11.....	*Birmingham.	C. J. Fowler, 2, High-street, Birmingham.
June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE FORTHCOMING CONVENTION.

To the EDITOR.

SIR,—The arrangements for the forthcoming meeting of the Photographic Convention of the United Kingdom, at Shrewsbury, commencing on July 15 next, are well towards completion. The central position of Shrewsbury and the attractions that will be offered are considered likely to draw great numbers of photographers from all parts.

I am already receiving a large number of applications for membership. The subscription is five shillings, and I shall be pleased to send further particulars to any applicant.

Sir Howard Grubb (the retiring President), Mr. A. Haddon (the President-elect), and the numerous and influential Council will spare no pains to make the Shrewsbury meeting one of the most important that have been held.

The Shrewsbury Reception Committees, consisting of the leading aristocracy and gentry of the district, are making great preparations for our reception. As soon as the programme is issued copies will be forwarded to the various Photographic Societies throughout the United Kingdom.—I am, yours, &c., R. P. DRAGE, *Hon Secretary.*

95, *Blenheim-crescent, London W.*

EXPLOSION OF OXYGEN CYLINDERS: A SUGGESTION.

To the EDITOR.

SIR,—If experiments should prove that we may eliminate molecular changes in metal as a possible cause of these explosions (fortunately rare), we shall have to discover the reasons for a rise of pressure in a cylinder which has stood the test of filling without giving way; for it seems certain that the metal which cannot hold the ordinary pressure would give way whilst filling, and not long afterwards, if there is no subsequent change in the metal, and the only alternative explanation is that of an increase of pressure from some hitherto unrecognised cause.

The few explosions which have occurred in which no mixture of gases has been identified have been, I believe, in oxygen cylinders, not in those containing hydrogen or house gas, and the oxygen has been that prepared from chlorate of potassium. Possibly there may be some conditions indicated by these facts which may put us on the right track. I understand that the cylinders are tested by hydraulic pressure, and there is a possibility of forming iron rust in the inside, which would be still more likely to occur when oxygen is forced into the cylinder.

Every one must have noticed, in preparing oxygen from potassium chlorate, a considerable amount of chlorine gas will sometimes escape absorption in the wash bottle, and come over-mixed with the oxygen. Would any chemical action result from chlorine upon oxide of iron under great pressure, with the possible presence of moisture?

My chemistry is not strong, but I have, in days past, prepared chlorine monoxide by the action of chlorine gas upon mercuric oxide. This gas is very soluble in water, and by freezing it forms an extremely explosive red liquid, which decomposes under no apparent provocation, with extreme violence, into chlorine and oxygen.

My suggestion is that chlorine may form this dangerous substance with iron oxide, and that great pressure may, like freezing, cause the

chlorine monoxide to change into the aforesaid explosive fluid, a very small quantity of which, on decomposition, would suddenly raise the pressure to a dangerous point.

This idea may be very far astray, but I think that we must carefully re-examine all the chemical phenomena possibly arising during the preparation of oxygen from possibly impure chlorate, and the possibly insufficient removal of chlorine gas, a gas which has tremendously active affinities, and forms several extremely explosive unstable compounds, some of which may possibly be formed under great pressure, which would not be formed under ordinary conditions.—I am, yours, &c.,

GERARD SMITH, M.R.C.S.

Craigholm, Upper Clapton, March 23, 1895.

EQUALISING THE ILLUMINATION OF A PHOTOGRAPH.

To the EDITOR.

SIR,—With reference to your leader of yesterday's date on this subject, although it does not now appear to be of great importance, I think it right to remind you that, so far as I am aware, the use of a V-shaped, as well as a parallel, bar, as applied to a camera lens for equalising the illumination, was first suggested by me about thirty years ago in a paper read before the Edinburgh Photographic Society, and published in your JOURNAL. The subject was also brought before the Royal Scottish Society of Arts, and was considered sufficiently novel to entitle me to the Society's silver medal.

Although I found the "bar" an advantage in the days of dry collodion, and used it regularly then, I have not found the same necessity for it with gelatine plates, the probable reason being that the collodion plates were more likely to be under-exposed, and the defective illumination at the sides being thereby more hurtful than it is with gelatine plates, which are less likely to be under-exposed.

I still possess some large photographs taken for me by Dr. John Nicol and Mr. W. H. Davies, both with and without the equalising bar, which prove the great benefit which was obtained by the use of the bar in conjunction with the old collodion plates.—I am, yours, &c.,

GEO. H. SLIGHT.

Brook Cottage, Ashburton, South Devon, March 23, 1895.

[There is no doubt that Mr. Slight, by his paper before the Edinburgh Society and the Royal Scottish Society of Arts in 1867, antedates every other discoverer of the bar before the stop, and of whom we are informed there are several.—ED.]

DECADENTS AND THE SALON.

To the EDITOR.

"Shades of old Nelson,
I still hear your voices,
Clear as a trumpet sound,
In the gale."

SIR,—I presume you are a seeker after truth, and your mission as Editor of the oldest photographic journal is to guide the way of your young readers to the study of the true and the beautiful.

Modern art cant and scientific verbosity are not beautiful, but rather weary the brain of an earnest reader, and are, moreover, a real impediment to progress in practical photography.

The representatives of the Linked Ring wishes us to believe that they are a generous body, who, from their pinnacle of culture, do nothing but lead the way of others to fame.

This new mantle of magnanimity may do in Bath and the Midlands, and be believed in, but not in the arctic regions of the north. If a ring means anything, it is selfishness.

Mr. Robinson says the Linked Ring eagerly look after promising young photographers. If this is true, why does he say that Αρς "soiled the pages of the JOURNAL," while, as a matter of fact, the article in question was a brilliant contribution, worth reading again and again? Mr. Robinson's reply was simply ordinary, with the usual cant about advancing artistic photography, which brings us not one whit nearer the truth.

"Fuzziness," or atmosphere in art or nature, owes its chief charm to colour. This new school of photographic dreamers must be awakened to this fact, that the taking of a negative is a simple chemical operation; the finished print a simple translation in one colour, and nothing more; on the other hand, art is a creation.

In conclusion, allow me to say that Mr. Coe's letter last week is certainly original. He advises the Linked Ring to run and hide their little heads, or this young Greek will pulverise the whole lot into stumping powder.

Whether this advice is worthy of the land that gave birth to "Hearts of Oak," I won't pretend to say; but, if there is any spirit of manliness in the Linked Ring, they will stand to their guns, and die like pirates of the Loire.—I am, yours, &c.,

Gallowhill-street, Banff, N.B. H. HOLMAN.

EXHIBITIONS AND MEDALS.

To the EDITOR.

SIR,—Dr. P. H. Emerson, in his remarks on the Royal Photographic Society's Exhibitions inserted in your issue of March 15, desires to raise the standard of all photographic work much higher than at present, principally by an increased rejection of pictures sent in for exhibition. He states that "quality is far better than quantity, and more appreciated, as proved in the year 1893, when he acted as a Judge and selector." In the majority of cases, no doubt, the trite saying which he has made use of is correct, at the same time it is surely not advisable, when dealing with such a rising art as photography, to use the pruning knife too severely. Had the Royal Photographic Society, on the occasion of their birth and their earliest exhibitions, enjoyed the advantage and advice of Dr. Emerson's "first-rate painter," and of himself as a "selector," there would probably have been an insufficient and scanty show of the black art, for few, if any, pictures would have passed the fiery ordeal. The high standard, rightly desired, can best be obtained by comparing the inferior work with the superior; thus, each year, it will be gradually raised by inciting exhibitors to better productions. *Facile princeps* as Mr. Phil. May is in his peculiar branch of art, it is difficult to understand how his great skill as a draughtsman fits him to be a good judge of photographic pictures. "Second-rate" painters are certainly not desirable, but in excluding all "old-fashioned painters" from being Judges we may err. This proposed weeding out of pictures would, no doubt, enable a gallery to be arranged, as Dr. Emerson observes, more "artistically" (objectionable as this word is both to use and to write), a wider space showing a suitable background could then be left between each frame, and the upper or sky line of pictures could be brought down nearer to the eye, and the floor line abolished, thus imitating in a way the agreeable arrangement in the Grosvenor Gallery, under Sir Coutts Lindsay.

It may be presumptuous on my part to take exception to any remarks made by such an authority as Dr. Emerson; but his adoption of the word "commercial," as applied to one of the three sections which he proposes, is somewhat unintelligible. Is it to distinguish and to divide the professional from the amateur; if not, what is it to comprise? Surely a clearer and happier term might have been adopted; or must we be driven to frequent hostelries of a peculiar class to find out this "commercialist" photographer?

Last year's Salon and the Exhibition of the Royal Photographic Society may possibly have suffered by the exclusion of "several pictorial works of real merit," owing, perhaps, to the Judges having been assisted in their work by the advice of the "first-class painter." Dr. Emerson's desire for "less" photographs and "less" medals will, however, as I have pointed out, enable those pictures that are admitted to be seen more advantageously, for fewer will be skied and fewer floored. Medals are, after all, very harmless, and sometimes, indeed, useful for the crucible or the toning bath.—I am, yours, &c., SLINGSBY BETHELL.

St. James's-street, W., March 21, 1895.

A HARD CASE.

To the EDITOR.

SIR,—May I be allowed to call the attention of photographic assistants, through your columns, to some harsh and unjust actions on the part of a firm who advertised lately? I wrote to this firm for a situation some time back as printer, and received a reply simply signed with a certain name offering an engagement. I accepted, and on arrival was surprised to find that this signature covered a firm doing the cheapest style of work, and that this plan of simple signature was adopted to gain assistants under false pretences. However, having come from the country, I was forced to remain. I was shortly informed that it was their rule to dismiss assistants at a day's notice, in opposition to the general rule of a week's notice in other photographic establishments. My railway fare was promptly refused. I was also told my working hours would be from eight in the morning till seven at night. And yet, with these unusually long hours, only half an hour is allowed for dinner.

On the first morning I was at the gate at eight punctually, but found that the firm's clock was three minutes fast, and that I had lost half a day's pay. This excessive fine for being a few minutes late is an everyday practice of the firm. I have seen girls locked out for being one minute behind the bell, and this loss of pay is serious to girls who earn barely enough with full pay to support themselves. It is obvious that the exaction is nothing but a trick to reduce the wage, and is no legitimate fine. But this is on a par with their treatment of employees throughout. One printer was ordered to help with a gas engine. He injured himself, through no carelessness on his part, and was ill for several days. Yet he received not one farthing of wages for those days. I consider such

conduct not only unjust, but cruel. Another assistant's two sisters called at the works to see him; for this he was bullied, threatened with dismissal if it occurred again, and the most serious reflections cast upon the moral character of his sisters. I could give case after case of like injustice and petty tyranny from the head of this firm.

Amongst other things I was promised a regular wage, and induced to accept a low salary, and yet was compelled to lose half a week's pay at every slight depression in trade. Each printer is compelled to sign an agreement that he will complete every order within eight days. All practical men will see the absurdity of this, when I explain that a printer has from three to four hundred presses to manage, which means, with two rounds, eight hundred prints a day for one man, doing his own charging. And the lash of dismissal at a day's notice is brought down to achieve this sweating.

The relations between photographers and their employees is in general so cordial that I feel bound to call attention to these unjust and petty-minded methods, which, if they become common, will tend to disturb the friendly relations which have hitherto prevailed.—I am, yours, &c.,

London, March 21, 1895. PRINTER.

[We have deleted the names our correspondent gave in his letter. The treatment to which he and his colleagues were subjected seems very callous and unjust; and, for the sake of the photographic profession, we hope and believe it to be unique.—ED.]

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—Not having been a subscriber for years to this Association, I shall perhaps be considered interfering in what does not concern me. Any way, my withdrawal from it was because I considered it fundamentally wrong in management of the funds. I expected, unless the system of giving relief to *any* deserving photographic applicant was very much modified, that the Association was bound to fail, or, at any rate, to be a very qualified success. This, by the reports published from time to time, seems to be the case. The idea of a small Association attempting to finance the whole kingdom—that is, to afford monetary or other relief to any person connected with the photographic business who may be deemed deserving—is Quixotic in the extreme, and certain to end in disaster; how could it be otherwise? If the funds were strictly limited to the relief *only* of members who *regularly* paid their subscriptions, there would be a chance of success, which does not seem to obtain at the present time. Did I not wish the Society every success, I should say nothing about it.—I am, yours, &c., OMEGA.

AMATEURS AND PROFESSIONALS.

To the EDITOR.

SIR,—The enclosed circular letter may be amusing. Copies were sent to all the members of the profession here by a body of gentlemen amateurs.—We are, yours, &c. G. & R LAVIS.

71 *and* 73, *Terminus-road, Eastbourne, March* 21, 1895.

"EASTBOURNE PHOTOGRAPHIC SOCIETY.

"GENTLEMEN,—At our forthcoming Exhibition it is proposed to offer every visitor the opportunity of being photographed free of charge, the matter being managed in the following way: A local professional photographer to take a negative of all who care to avail themselves of the privilege, and arranging to send them *one* print, say, *carte* size, in due course. It is desired that one photographer should operate in the day-time and another after dark, using the electric or other artificial light, space and facilities being, of course, allowed for the purpose.

"I need hardly point out the source of profit which the possessor of some hundreds of negatives would certainly find in subsequent orders to show that the proposal is well worth consideration. If you entertain the idea, perhaps you will kindly let me know as early as possible, saying at the same time what sum you are disposed to offer for the privilege. The Committee do not bind themselves to accept the highest or any tender.—I remain, yours truly,

"J. J. HOLLWAY, *Hon. Sec. and Treasurer.*

'11, *Hyde-gardens, March* 14, 1895."

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange Lancaster's '94 perfect Omniograph hand camera, half-plate size, with changing box, for a good lens or fine burnished.—Address, C. DROBIG, 151, Stamford-street, London, S.E.

Model yacht cutter, in good condition, would exchange for good half-plate camera, complete, with lens, &c., Lancaster preferred.—Address, T. W. BARTHOLOMEW, 18, Waterloo-crescent, Dover.

Will exchange my Russian iron lantern, cost four guineas, and 300 lantern slides, list forwarded, cost over 20*l.*, for good whole-plate photographic apparatus, complete, with no less than three double backs.—Address, C. KIRKHAM, Photographer, Leek.

Will exchange for a half-plate set the following: Twelve-cell bichromate battery, in case, each cell giving a current of two volts for ten hours with one charge; two adjustable watch telephones, and patent automatic switches complete; six dry batteries for working same; also powerful induction coil, primary and secondary wires, quite new.—Address, C. LE MAINE, 2, Clarendon-villas, Hythe-road, Ashford, Kent.

Will exchange a splendid van for pony, answers for dark room and advertising purposes, for lenses by Ross or Dallmeyer.—Address, J. LEACH, 2, Dinorwic-street, Carnarvon.

Ross's symmetrical lens, 15×12, No. 10, fifteen-inch focus, cost 9*l.*, in first-class condition, cash offers, or 12×10 camera and slides, with movable back for wide-angle work.—Address, R. FORTUNE, Photographer, Dumbarton, N.B.

Exchange Fletcher's gas stove, and lot gilt-edged (bevel) opalines with backs; want pneumatic safety.—Address, H. WILKINSON, Harpenden.

Will exchange Dallmeyer's patent portrait group lens 4D, No. 23,076, also a 12×10 wide-angle rotating stop (perfect condition) and two 12×10 book slides; 3¼-plate, ditto new, Middlemiss make, and two 15×12 printing frames for Dallmeyer's 15×12 rapid rectilinear, and a good 15×12 wide-angle; approval required and given.—Address, A. E. & C. FOX, Bradford.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

GORDON.—Air bubbles are probably the cause.

W. H. MARK (Runcorn).—Tie the camera stand to the cross-bar of the bicycle.

MATH-NODASSY (Uj-Pest).—P.O.O. to hand. Please send particulars of your requirements.

H. C. J.—There is no reason why a low-price lens should not yield a good picture when it is used with a small stop; any lens will do so. Indeed, if the stop be small enough, a "pinhole," the lens can be dispensed with altogether.

C. BEALE.—Is it possible that the youth is suffering from colour-blindness to a limited extent? From what you say we surmise he is. If that be the case, his failing to see that prints of different tones are different in colour is not a fault of his, but is his misfortune.

A. M. Z. asks: "When using your metol in hydroquinone, soda-sulphite and carbonate developer on a correctly exposed plate, does the image flash up when the developer is applied, or does it gradually appear as with pyro?"—The image appears gradually.

CASTLEBAR (County Mayo, Ireland).—We cannot understand the first part of your query. Please be more explicit. With regard to the most suitable developer, you cannot do better than use that recommended by the makers of the particular paper you are employing.

LENS writes: "I am wanting a lens that would be useful for enlarging, copying, and portraiture. Will you kindly inform me which would be the most suitable for that purpose?"—If one lens is to answer for all purposes, one of the rapid rectilinear type will be the most suitable.

H. J. R.—As the picture is not registered, you can take no action; but it can be registered at any time. We should advise you to communicate with the Secretary of the Photographers' Copyright Union, Botolph House, Eastcheap, E.C. See his letter in our issue for last week.

H. GOGGS (Huntingdon) writes: "Where can I obtain a print like the shade enclosed, and by what process?"—Prints of the exact tint may be obtained by the carbon process with a tissue made of that colour. Or any of the photo-mechanical processes will give it. As with them, any coloured ink can be used.

A. CARR.—To make the copy in the way stated would be a decided infringement of copyright, and we should advise you to abandon the idea, or you may find yourself mulcted in heavy damages and costs. Publishers who have paid large sums for paintings, or copyrights, are not slow in protecting their rights.

S. H.—Pending the inquiry, we can give no opinion as to why the cylinder burst. If you "will have no more cylinders in your house" there is no reason why the lantern should be abandoned—gas bags are to be had still. The lantern existed an age before cylinders were introduced, and as good a light was produced then as now.

D. Butt says: "The Tanqueray Free Portrait Society are just now flooding this town with their circulars. Shall I do wrong, or lay myself open to an action for libel, if I exhibit one of them with a warning that the affair is a swindle?"—In reply: We should think you would be quite safe in warning people to have nothing to do with the affair.

S. X.—1. The alleged advantage of the more expensive lens is that it has a flatter field than the other, with stops of equal dimensions. Depth of focus depends entirely upon the size of stop, but we think that the one lens will serve quite well for both your cameras. 2. We have no acquaintance with the extra-rapid shutter named, being content with the ordinary one.

Copyright says: 1. "I have a photograph sent to copy, taken last October with a hand camera. How can I know if it is copyright? 2. As I can print any number I like, can I make it copyright if it is not done?"—In reply: 1. Only by consulting the register at Stationers' Hall. 2. Certainly not. You are not the author of the work, and did not take the picture.

Henry Boyle.—As the focus of the lens is elongated as it is approached nearer the sitter, so will the exposure have to be increased, as you have found by experience. What may be *f*-8 at the principal focus of the lens may be *f*-16, or *f*-32, or anything else, as the camera is brought nearer and nearer to the object. The exact aperture is a simple calculation.

Selcinnur says: "Some time back I read in your Journal the notice of a new triple lens, by Mr. Dennis Taylor. I can see no practical difference between this and that of Messrs. Abbe & Rudolph, at one time made by Mr. Carl Zeiss, but now discontinued. Am I right in my deductions?"—We have no knowledge of the Abbe-Rudolph triple; but you are probably wrong in your deduction.

Reflector.—1. The reflecting principle spoken of is thoroughly reliable, and is equal in working to the twin lens. 2. Yes. 3. We cannot speak as to the lens supplied, but the London agents have too high a reputation to sustain to permit them using any but the best. 4. In some respects they are superior. We refer you to an article bearing on this subject which appeared on page 1 in the present volume of this Journal.

Herbert Strickland.—Many different kinds of apparatus have, from time to time, been explained in the Journal which, with calculations, will give the necessary information you desire. No tables have been published, and, if they were, they would, of course, all depend upon the accuracy of the speed of the shutter, which, of course, is not alike on all occasions. However, space in this column is far too limited to deal with the subject in a useful form, particularly as you mention that there must not be any complication.

R. Robertson.—Ceramic photography has not been worked for large sizes to any great extent. The "carbon process" has been utilised, but not to much extent commercially. We have seen fine examples by this method on porcelain plaques up to fifteen or eighteen inches that could leave nothing to be desired, except, perhaps, more perfect plaques to begin with. If you have anything new, the public taste might be sounded. Why ceramic photography has not hitherto succeeded commercially is that the public has not seemed to appreciate it.

Nervous writes: "Can you let me know if the picture representing the Tichborne Trial is copyright? It is a photograph, 12×10, from a painting, and is much faded, and I wish to copy it, but before doing so would like to be on the safe side."—We do not know, but the register at Stationers' Hall will show. We have an idea that there were more than one picture published in connection with the Tichborne case, and we have very little doubt that they were all made copyright at the time. We have a distinct recollection that some of the photographs of them were marked copyright.

Fred Titmas (Klerkodorp, Z.A.R., South Africa).—"Will you kindly tell me how to drape a portable studio. I am making a light framework, 20×10×8 length, breadth, and height. As the light in England is north, this, I presume, should be south; if so, which is the proper end of studio for the sitter, east or west?"—We should recommend that three feet or three feet six at either end of the studio be made opaque. That the curtains or blinds of the roof be of dark blue or light green, and those at the side of a similar colour. Then if a background be at both ends of the studio, sitters can be arranged in the morning at one end and in the afternoon at the other, as occasion may require.

Colonel says: "I am about taking out provisional protection for my focussing arrangement, and I thought before doing so I should like to take the opinion of some respectable firm of camera-makers as to its merits, and whether they would take it up or not, of course under a *bonâ-fide* agreement beforehand that they would not appropriate themselves, or divulge to any one, the arrangement or any part of it in the event of our not coming to terms. If we came to terms, I should be prepared to hand over the whole thing for a reasonable consideration, and have done with it. Do you think it would be safe to take this course, or would you advise me to first obtain provisional protection?"—In reply: Better obtain provisional protection first. It only costs 1*l.*, and is well worth it in such cases as yours.

Anxious Inquirer writes: "I wish to inquire of you as to whether there is any law to prevent me from building a glass studio in a back garden in the North of London, providing it is a portable one—that is, adjoining no other property, and not touching the ground, resting on two beams? My reason for asking is, I desire to start in business for myself this season, and, my means being somewhat limited, I shall be compelled to do it as cheaply as possible. I might state that the dimensions would be, height, nine feet; breadth, ten feet; length, twenty feet."—If the building is what comes within the Building Act as a fireproof one—that is, glass, with wooden sash-bars only, and is situated some four feet or so from any other building or party wall—we believe the district surveyor will pass it; but we should advise that he be consulted and plans submitted before the work is commenced. This may save trouble in the end.

Nobrac asks: "1. Of what ingredients is a silver bath for intensifying carbon transparencies formed? 2. What other chemicals are used for bringing the image out stronger in addition to the above bath? (Potassium cyanide is used, but of what strength?) 3. Required the quantities of enamel collodion, methylated spirit, and ether for the making of collodion for carbon transparencies."—1. Simply a solution of nitrate of silver of about ten grains to the ounce of water. 2. The ordinary pyrogallic acid developer as used in the wet collodion process, to which a few drops of a solution of nitrate of silver—twenty grains to the ounce—have been added. If a solution of cyanide of potassium be used, it should be a weak one, say seven to ten grains per ounce, applied after the requisite density has been obtained, and the plate washed. 3. Equal parts of ether and alcohol with sufficient pyroxyline to make a collodion of the right consistency—five to eight grains to the ounce, according to the character of the pyroxyline used.

THE GAS-CYLINDER EXPLOSION.—ADJOURNED INQUEST.

On Wednesday, March 27, at the City Mortuary, Barbican, Mr. A. Langham resumed his inquiry with reference to the death of William Holbrook, aged fifty-five, gardener to Dr. Kennedy, of Plaistow, who was killed by the explosion of a cylinder containing oxygen gas, at Fenchurch Street Station on Friday week.

At the previous hearing Inspector McLachlan, of the Great Eastern Railway, swore that he had at one time stopped Dr. Kennedy's page-boy at Fenchurch-street Station while he was carrying a cylinder. The Coroner now stated that it had transpired that this was not true, and he called Frederick Backer, an errand boy in the employment of the Rev. Mr. Shaw, of Barking, who stated that on Friday fortnight he was sent by his master to Messrs. Newton, of Fleet-street, to get a cylinder filled with gas. On returning to Fenchurch Station he discovered that he had lost his ticket, and while he was searching his pockets an inspector asked him what he had in his parcel. Witness replied, "It's a cylinder." The inspector then said, "What would happen if you were to drop it?" to which the lad replied, "It would blow me to pieces." The inspector then told him that he could not travel by rail, and took him to the station-master's room.

Inspector McLachlan then entered the witness-box, and apologised for having confused the last witness with Dr. Kennedy's page-boy.

Mr. Arthur Newton, of the firm of Newton & Co., stated that they were in the habit of receiving cylinders to be filled with gas. They did not themselves fill the cylinders, but the work was carried out by Mr. Clarkson, of Bartlett's-buildings, Holborn, in a perfectly satisfactory manner. Witness had never known of an accident with the cylinders. He had known of cylinders having been dropped and no accident following. He had examined the exploded cylinder, and could not find any flaw in the steel.

Thomas Abbott, a chemical gas manufacturer and compresser, said he was in the employ of Mr. Clarkson. The gas was manufactured there, and the cylinders filled and tested. Witness had orders from Mr. Clarkson to fill all Messrs. Newton's cylinders with gas made from chlorate of potash at 120 atmospheres, and he did this with the cylinder which exploded, having ascertained by his gauge that it was properly filled.

The Coroner: When you find it difficult to unfasten the valve to enable you to fill the cylinder with gas, do you ever use oil or grease?—No. With similar bottles, containing nitrous oxide, we sometimes use beeswax. The cylinder which exploded was filled in the ordinary manner. There was nothing wrong in the valve, otherwise it would have been returned. No oil or grease was used upon it. There was no machine kept on the premises for specially filling cylinders with oxygen.

The Rev. Thomas O'Riley, of East Ham, swore that within the past two years he had carried cylinders through the barrier at Fenchurch-street Station without being interfered with. Sometimes there was no covering upon the cylinder, and at other times merely a piece of brown paper.

Expert Evidence.

Mr. Kenneth Murray, Manager and Engineer to the Brin's Oxygen Company, said he had examined the exploded cylinder, and found that it was made of mild steel—the best possible material for cylinders.

The explosion, he thought, was due to mixed gases in some form or other in the cylinder. Oil or grease would not be sufficient to account for the explosion. The cylinders, if tested and analysed, were absolutely safe to be carried by train or otherwise.

The inquest was again adjourned.—*Evening News.*

CONTENTS.

	Page
CARBONATES	193
ON THINGS IN GENERAL. By FREE LANCE	195
CONTINENTAL NOTES AND NEWS	195
AMERICAN NOTES AND NEWS	196
FROM SUNSHINE TO SHADOW AND BACK.—III. By HUGH BREBNER	197
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—IV. By T. N. ARMSTRONG	198
THE ART CRAZE. By WALTER D. WELFORD	199
THE EXPLOSION OF AN OXYGEN CYLINDER	201
RECENT PATENTS	201
NEWS AND NOTES	202
MEETINGS OF SOCIETIES	203
FORTHCOMING EXHIBITIONS	205
CORRESPONDENCE	205
EXCHANGE COLUMN	207
ANSWERS TO CORRESPONDENTS	207

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1822. Vol. XLII.—APRIL 5, 1895.

LENSES OLD AND NEW.

As an addendum to the last meeting of the Royal Photographic Society, there is now on view in the Society's rooms, 50, Great Russell-street, a considerable collection of photographic lenses, of an ancient as well as of a modern type. The grasp is reasonably comprehensive, for it includes what is stated in the catalogue to be the first combination objective made in England, as it certainly does some that have only been introduced, commercially at any rate, within the last few months.

The one for which the greatest antiquity is here claimed was made by the late Andrew Ross for Henry Collen, a miniature painter, soon after H. Fox Talbot had completed the patenting of his invention of the Calotype. Mr. Collen had the acumen to see that this young art, all imperfect as it then was, might probably effect a revolution in the art of the miniature painter, so he became one of the first licensees to work under Talbot's patent, and applied to Mr. Ross to provide him with a lens suitable for portraiture, the one now on exhibition being that which was supplied. About the same time, Chevalier, of Paris, and Davidson, of Edinburgh, also claimed to have constructed combination lenses for portraiture, but all the forms of those of the three opticians named were dissimilar, and none of them would give sharp images without a diaphragm, that great invention being reserved for Petzval. Collen exposed his sensitised paper between two spherically curved glass plates, as the field of the lens was hollow. Several years after the death of Andrew Ross, his son, the late Thomas Ross, modified the form adopted for the Collen lens by making its components of a meniscus instead of a plano-convex shape, and it was well known as Ross's Actinic Doublet. A specimen of this objective is amongst those now on exhibition.

The collection of lenses of a more modern type lent to this Exhibition by Ross & Co. is both rich and varied. It comprises those formed of the newer kinds of optical glass, and for the making of which the firm has justly acquired a high reputation. It was the special properties to be found in Jena glass that rendered possible the construction of their Concentric lens, by which, for the first time absolute flatness of field, with freedom from astigmatism, was obtained. This seems to have put Continental mathematicians on the *qui vive*, the result being exhaustive investigations into the properties of the various kinds of glass with a view to the production of objectives of the largest possible angular aperture, yet which should give a field that would be quite flat with the utmost perfection of image.

For all these, with perhaps a single exception, Messrs. Ross & Co. have secured the sole right of manufacture in this country, and the Exhibition is correspondingly enriched by a great variety of them. For here we have, lent by this firm, the Zeiss Anastigmatic lens in the several series in which they are made, represented by no fewer than eight; also the Goerz Double Anastigmatic lens, which some time since was specially introduced by C. P. Goerz to this Society.

One of Zeiss's lenses, the latest series (Series VII.) is composed of no fewer than four elementary lenses cemented together so as to form a whole, these elementary parts being composed of different kinds of glass. Hence each doublet of this particular class contains eight simple lenses. This, it is believed, is the latest contribution to our optical resources. In the specimen shown the front and the back are of different dimensions.

The various kinds of "symmetrical" lenses, including the rapid, the wide-angle, and the portable, are all here, together with others of the firm's manufacture, of an older type, such as the Actinic Triplet, Sutton's Panoramic lens (a spherical shell filled with water), and one of Archer's "Water" lenses, the word quoted being one which, we think, might lead to a misapprehension, as, if we are not mistaken, the fluid employed was, in reality, a solution of a salt of antimony, this being found by Archer to give the best actinic correction when used with crown glass.

The loan collection of J. H. Dallmeyer, Limited, embraces examples of nearly every class of lens made by the firm. We find Petzval portrait lenses and those with the adjustable back lens invented by Mr. J. H. Dallmeyer; wide-angle landscape and rectilinear lenses; rapid rectilinears and the rectilinear landscape lens, together with three tele-photographic lenses. The compiler of the catalogue has, we think, made a slight mistake in entering the Dallmeyer triple achromatic lens as "Mr. J. H. Dallmeyer's Patent." If we remember aright, this lens was not patented. But it was, more or less, extensively imitated soon after it was brought out.

There are several specimens of the American Globe lens lent by Mr. Chapman Jones and Mr. R. Slingsby. This was the earliest wide-angle non-distorting lens on record, but it became unpopular on account of the flare spot given by so many of them. It is singular that Harrison & Schnitzer, the inventors, did not think of eradicating this fault, which could easily

have been done by setting the lenses a little closer together, but they had a fad as to keeping the outer surfaces at such distance apart as to form part of a globe. They were supplanted by others of English manufacture and are not now made by any one.

No fewer than ten examples of his double anastigmat have been contributed by C. P. Goerz, of Berlin. We have already alluded to their properties.

Owing to the showcase of Messrs. Marion & Co. having been locked at the time we were being shown the collection, we were unable to examine a very fine assortment of Voigtlander lenses, embracing euryscopes of the rapid, medium, and wide-angle types, the anastigmatic, and their last one of all, the collinear. It is probable, however, that this latter will form the subject of a brief descriptive article next week.

No fewer than twelve different specimens of Jena glass have been presented to the Society by J. R. Gotz. The value of these is enhanced by the indices of refraction and dispersion being tabulated both on the glass itself and in the catalogue.

While there are many forms of lenses "conspicuous by absence" from this Exhibition, yet are there enough to render it well worth the time of any one to pay it a visit to see some of the extinct lenses, and all of those of the most recent period.

IMPORTANT COPYRIGHT DECISIONS.

The arguments in a suit that has been before the Law Courts, and has attracted a good deal of attention, for the last year and more, after occupying the Court for several days, were concluded one day last week. The suit has become known as the "Living Pictures" case. The case, taken by itself, is of little immediate interest to photographers, but there are other cases in connexion with it that are of importance to all holders of copyright.

It will be remembered that somewhere about this time last year the Empire Theatre of Varieties produced a series of *tableaux*, "Pictures of Living Masters Realised," and amongst the number were several popular ones, in which Herr Franz Hanfstaengl, the well-known publisher of Munich, London, and New York, holds the copyright. Soon after their exhibition, that gentleman, the plaintiff in the several actions, instituted an action for an injunction to restrain the exhibition of his works in that way, and claimed penalties and damages for the infringement of his copyright. During the arguments, at that time, the case of Turner *v.* Robinson was freely quoted, and it has considerable interest in connexion with the two other suits to be referred to presently. That case was this. The plaintiff, Turner, was the holder of a copyright of a painting, the *Death of Chatterton*. The defendant, a photographer, after seeing the picture, arranged in his studio a garret scene like that depicted in the painting, and introduced a living model in the same pose as the Chatterton in the picture. He then took photographs of it, which he afterwards published. Proceedings were taken for an infringement of copyright, and it was decided that the photographs, though taken from solid accessories and a living model, were an infringement of the copyright in the original picture, and that judgment was upheld on appeal to a higher Court.

In the Empire case, now to be referred to, it was decided by Mr. Justice Stirling that the *tableaux* were not an infringement of the plaintiff's copyright, in so far as the models were concerned, inasmuch as the Copyright Act of 1864 enacts that the pirated works should be forfeited to the owner of the copyright, and, of course, this could not be done with the living models, though, in the case of the backgrounds, it might be different, as the Act distinctly mentions piracy of the picture, or "any part thereof." He refused the injunction applied for, on the defendant's giving an undertaking to keep an account of the number of times the backgrounds were used and the amount of moneys received at the doors of the theatre where they were until the trial of the action. The backgrounds, it may be mentioned, were soon substituted by others. Against the judgment of Mr. Justice Stirling the plaintiff appealed, but the Court of Appeal upheld the judgment of the Court below. The arguments in the trial of action were concluded one day last week, and amongst the witnesses called were some Royal Academicians, who testified that the backgrounds were a very important part of the pictures. The artist who painted the Empire backgrounds was also called, who stated that he was supplied with the plaintiff's photographs to work from, and he copied them as near as he could. In the end, Mr. Justice Stirling reserved judgment in the suit.

Arising out of this case were two others that are of greater direct interest to photographers, particularly now that they are beginning to stand up for their rights against the illustrated press, and indeed to the holders of copyright generally. When the Empire first produced the "living pictures," the *Daily Graphic* and the *Westminster Budget* reproduced some of the *tableaux*, whereupon Herr Hanfstaengl proceeded against both papers for infringement of copyright—seeking an injunction. The case against the *Daily Graphic* was dealt with some time ago, when Mr. Justice Stirling decided in favour of the plaintiff, as might have been surmised from the ruling in the *Chatterton* case just referred to. Against this judgment, the defendants took the case to the Court of Appeal, and that court reversed the judgment of the Court below. Then the plaintiff appealed to the House of Lords, and here the ruling of the Court of Appeal was affirmed. Their Lordships said that, looking at the variations between the originals and the rough sketches, the latter were not, in fact, copies, reproductions, or colourable imitations of the original pictures or the design thereof, and did not constitute an infringement within the Copyright Act.

The suit against the *Westminster Budget* was very similar to that of the *Daily Graphic*, except that the sketches were more complete and elaborate in the details, and was, for convenience, proceeded with simultaneously with that of the Empire. Two R.A.'s, Mr. Alma Tadema and Mr. Marcus Stone, who were also witnesses in the Empire suit, testified that the cuts were decidedly copies of the plaintiff's pictures and the design thereof. One of the witnesses, after he had been shown one of the cuts in the *Daily Graphic*, and expressed his opinion upon it, was asked by the Counsel for the defence if he would be surprised to learn that the House of Lords had decided that these crude cuts were not infringements, created some amusement by replying to the effect that he should not be at all surprised at any decision of the House of Lords on questions of art. It was contended that the pictures in the *Westminster Budget* were better than those in the *Daily Graphic*, and that they came within the Copyright Act.

In delivering judgment, Mr. Justice Stirling said that, in the case of the *Daily Graphic*, he had thought that the sketches were copies or colourable imitations of the pictures of the plaintiff. They might be bad copies, or imitations, if you please, still he thought they were copies; but the Court of

Appeal and the House of Lords thought otherwise. After reading from the judgments delivered by Lord Lindley and the Lord Chancellor respectively, the learned Judge said it became his duty to apply in his Court the principles that were applied in the Court of Appeal and in the House of Lords in the case before him, and, in the result, he gave a verdict for the defendants, with costs. He, however, stayed execution pending a question of appeal, and so the matter rests.

From the above judgments it would appear that, if, as in the case of the two Journals proceeded against, the cuts are crude or badly done, there is no infringement of copyright. Indeed, on the Judge remarking that the faces were entirely different in the two pictures, and that it was for that reason, amongst others, that the Lord Chancellor had pronounced the *Daily Graphic* reproductions to be no infringement, Mr. Moulton, Q.C., for the plaintiff, then asked if it was contended that you cannot infringe copyright unless you are a good artist? His Lordship replied that he had no occasion to lay down any proposition of that sort. He was content to take his stand with the words of the highest authority which was provided for his guidance. The decisions in the two cases referred to clearly tend to render the present Copyright Act still more unsatisfactory than it was before to the owners of copyright, whether photographic or otherwise.

UNEVEN TONING.

A SET of albumenised paper prints as referred to by "Puzzled" in our correspondence columns, form an excellent example of the vagaries that home-sensitised albumenised paper is liable to. We are in no way decrying the use of this printing medium, for we hold the opinion that a good print from a good negative, made on this printing medium, is difficult to surpass by any of the new papers by which the market is now flooded. At the same time we have little but praise for the latter; each is good in its place, and the most uniformly excellent work we have seen has been done by those who have learnt the capabilities of each paper, and adopted one or the other as older negatives required, or else have adapted their new negatives to the paper.

Our readers may rest assured that, if transparency, softness, and sufficient contrast as characteristics of their work on glossy paper be aimed at, high glaze being purely a secondary desideratum, such due adaptation as we describe is the true secret of success. The great advantage of the gelatine papers is that they are not liable to the irregular results referred to in the letter of our correspondent. With the mechanical means now at command, it is possible, granting the emulsion is of good quality, to coat a very large quantity of paper, so that every sheet shall possess the same characteristics, and behave in a similar manner under similar circumstances. True, it renders the printing far simpler and easier to the non-expert, a qualification which the older hands are apt somewhat to resent in nullifying the advantage their trained skill would otherwise give them. But this is an advantage really, for a good photograph is, after all, a matter of brains; "you press the button, we do the rest," does not anticipate the highest average of pictures.

Granting, then, a continual demand for that very old favourite, albumenised paper, it will be well to see whether some of the irregularities it possesses may not be corrected. The prints sent for inspection are, indeed, "mixed"—some very good, others just as poor. The causes appear to be twofold—uneven brilliancy of surface and uneven floating on the silver bath; but these two hang together. Given two papers, one with a thicker coating of albumen than the other, the prints they will give are bound to be uneven if each sheet of paper has the same time of floatation. The more glossy the paper, the longer the time needed for the silver solution to penetrate its texture. This is one of the difficulties of the material. The condition of the albumen may vary, as also the state of the atmosphere as regards suspended moisture, the temperature, and the thickness of the paper; and all these cases combined, or any one singly, will cause a film of albumen to vary as regards its thickness or its glossiness. Further, each variation will cause corresponding differences in the character of the resulting prints.

It will thus be seen that considerable judgment will be required in the printer when sensitising his paper. It is the custom of some to go through a whole ream when opened, and examine each sheet, dividing them into two or three batches, each of as uniform a surface as possible. They can then, without further trouble, float their paper to a uniform time, taking care to agitate the bath after each sheet is withdrawn. The proper time once arrived at by experiment, the printer is sure of his sheets all toning alike—that is to say, from any particular negative, as is the case under discussion. No process will give equal results from every type of negative. Some of the prints therefore (we have amongst them really good ones to prove what the negative is capable of) clearly show imperfect or insufficient sensitising. The cause is obvious, taking for granted the correctness of our correspondent's statement that all the paper was floated for the same length of time. These bad prints are on exceptionally brilliant paper—paper that *à priori* ought to give the best prints; but, owing to their extremely repellent surface and thick coating, they have not had the whole of the alkaline chloride converted, with the result of grey tones, flat pictures, want of contrast, and depth in the shadows. The remedy is simple. Let the prints remain in the bath for perhaps twenty-five per cent. a longer time; then, instead of being flat and poor, they will come out better or more brilliant than the best.

There is one other possibility—a very important one to consider at this time of the year—one we have before referred to, the temperature of the silvering solution. If this be not uniform, no amount of care in other parts of the process will enable uniform results to be obtained. Apart from any question of the toning bath, our correspondent and others in like difficulties will obtain uniform results by having their paper uniform in surface and floated at a uniform temperature.

UTILISING ACCIDENTALLY EXPOSED PLATES.

CIRCUMSTANCES may, and indeed frequently do, arise, under which a method of utilising plates fogged by accidental exposure to light, or other causes, becomes decidedly useful; not that we should recommend the subsequent employment of such restored plates for the highest class of work, but there are numerous purposes to which they may be applied without any disadvantage. It is scarcely to be expected that films of a high degree of sensitiveness, for instance, will pass through the chemical treatment necessary to eliminate fog without to some extent lowering the original sensibility, unless indeed they are submitted to a course of treatment out of all proportion to the

ultimate benefit to be derived. But, at least, they may be put to practical use for copying or similar purposes in which extreme rapidity is not of paramount importance. In some respects, indeed, plates that have undergone the treatment to be described are actually better adapted to the work to be executed than when in pristine condition, notably in the reproduction of line work or for the making of process negatives.

It is not only the effect of accidental exposure to light that may be thus neutralised, for plates that have deteriorated, through age or from faulty preparation in the first instance, may often be restored to a usable condition, provided always that the films are free from physical defects. It must, indeed, be a bad sample of emulsion that refuses to give way to the combined influences brought to bear to restore the silver bromide to a clean and workable state. Even films that show the well-known iridescent and metallic markings round the edges, visible frequently before exposure, have proved perfectly amenable to this treatment, and have produced negatives that have proved free from flaw. The following short account of the way in which a box of plates, accidentally exposed to daylight, may prove useful to some of our readers; and, though it is not every day that a number of plates are spoiled at once, occasional ones may be saved until the opportunity occurs of utilising them, instead of at once consigning them to the waste box.

The first stage of the operation consists in submitting the films to the action of a solution of bichromate of potash, which, as is well known, possesses the property of destroying the action of light or desensitising the film. This part of the process is easy enough; the real difficulty, if such it can be called, consists in removing the bichromate after it has done its duty, for it follows as a matter of necessity, considering its powerful action, that the slightest trace remaining in the film will continue to exercise the same function and neutralise any effect of light as soon as it occurs, or practically render the plate quite insensitive. Bearing this in mind, it will be found advisable to keep the strength of the bichromate solution at as low a point as is compatible with a thorough performance of the task required, as then not only will there be less of the salt to remove, but it will have a less powerful effect in lowering the general sensitiveness.

The strength we have found most convenient is a two-and-a-half per cent. solution, or half an ounce of the bichromate to a pint of water. This may be supplemented with advantage by the addition of ten grains of potassium bromide to each ounce in the case of simple exposure to light, or, if chemical fog be present, a few drops of hydrobromic acid may be substituted; or, if that be not available, a small quantity of hydrochloric acid in conjunction with a soluble bromide. Hydrochloric acid alone, *i.e.*, without the bromide, will, no doubt, serve the purpose, though we usually employ both, the object being, with the aid of the bichromate, to convert any soluble or insoluble silver compounds present into the haloid form.

In very warm weather it may be beneficial to use some alum in conjunction with the desensitising bath, especially if the films are of a soft character and exhibit any tendency to dissolve or blister, but at ordinary times it is unnecessary. At any rate, the addition can do little harm either to the film or its sensitiveness, since the after-treatment is designed to restore the latter as far as possible.

An immersion of five minutes in the desensitising solution, the plate being plunged into it in the dry state, should be sufficient; a longer soaking will do no harm unless the temperature be very high; but it should be long enough for the bichromate to thoroughly penetrate the film. A mere surface application may suffice to remove the greater part of the fog, but a plate insufficiently treated will not be capable of bearing forced, or even ordinary, development without showing some signs of fog; whereas, when the action of bichromate is thorough, the films are remarkable for their cleanness of working and their capability of withstanding almost any treatment within reason. On this account, plates treated in this manner are especially adapted for process work, where the utmost clearness, combined with density, are required.

On removal from the desensitising bath, the plate should be well washed back and front under the tap, or with copious floodings from a jug, and then placed to soak in clean ordinary water for ten minutes or a quarter of an hour, a running stream being, of course, preferable to simply changing the water. Up to this point, ordinary tap water, however hard, may be employed, as the slightly acid state of the film will prevent the deposition of lime salts, at least to any appreciable extent; but after this it is better to employ rain or distilled water. The next bath is one of very weak bromide of potassium—two or three grains to the ounce of water—in which the plate is allowed to soak for another five minutes; and this is followed by a third, containing two minims of strong ammonia in each ounce applied for five minutes longer. After this, a final soaking for five minutes, or a good wash from a jug of filtered rain water, will put the plate in a state to be again used.

It may now be drained and put away in a dark box or cupboard to dry, or may be at once exposed in the wet state. The latter, we imagine, will be the more general, as it is the better, course, for not only is the drying in most dark rooms a troublesome operation, and in view of the low prices of plates scarcely worth the expenditure of care, but it is very likely to develop physical defects in the films that are not present in the wet plate. Moreover, we imagine that few of our readers will resort to this mode of recovering plates, except in such cases as we have hinted at, where a very clean-working plate is required for a special purpose, as, for instance, when it is necessary to extemporise a "photo-mechanical" plate from the stock of extra-rapid ones.

The use to which we put the spoilt plates referred to at the beginning of this article was of a similar character, namely, the conversion into orthochromatic or colour-sensitive films. Where such plates are not at hand when the necessity arises for them, the only way out of the difficulty is to resort to the "dipping" process, for which "light-struck" films are, in our experience at least, as useful as the best. Indeed, on any future occasion when we may have to resort to the dipping method, we shall most decidedly apply the preliminary treatment with bichromate in order to secure the advantage of clean working.

To render the films colour-sensitive they were dipped for one minute in an ammoniacal solution of erythrosine made as follows: Three grains of the colouring matter were dissolved in one ounce of strong ammonia, and of this stock solution ten minims were added to each ounce of water to form the "dipping" bath, which was used once only and then thrown away. The plates were placed direct into this, after a slight rinse, from the last bath of ammonia, and after one minute's immersion they were drained on blotting-paper, exposed and developed straightway without drying. If required to be dried, it would probably be better to soak a little longer in the erythrosine and to wash before drying.

The results obtained under the circumstances we have detailed were in every way satisfactory, mechanically and chemically. No physical defects were introduced by the prolonged series of soakings, and, both with and without the colour screen, the orthochromatic results were what we expected, and the cleanness and quality of the resulting negatives all that could be desired.

In conclusion, though perhaps at first sight it may not seem worth all the trouble, we would once more point out what we have already endeavoured to emphasise, namely, that if a dozen plates *have* to be "dipped," and the spoilt ones answer as well as the good ones, there is a decided gain of a dozen plates without any waste of trouble.

A Lower Depth.—A correspondent writes: "Referring to your note on 'Photo Tea' in last week's JOURNAL, the enclosed cutting seems to show that a lower depth still has been sounded." This is the precious cutting:—"———, portrait and landscape photographer, picture-frame maker, mount cutter, &c. N.B.—Photographic Tea Stores. Every one who buys one pound of ——— 2*s.* 6*d.* tea can have their portraits taken Free of Charge, their pictures framed, or an enlargement made. Call and inspect the goods, they are of real value."

Astro-photographic Measurement of Time.—M. G. Lippmann has devised a photographic method of indicating the time of occurrence of astronomical phenomena, so as to avoid the discrepancy incidental to what is termed "personal equation." It is difficult to render the process understood without a prolix technical description; but it consists, broadly speaking, of photographing the image of a platinum wire, rendered incandescent for a brief period at the beginning of each second of time, and so arranging the position of the image that it is adjacent to that of the phenomenon photographed, in such a manner as to permit the time and position in the heavens to be read off without error.

"Rusting" of Aluminium.—In view of the considerable impetus given of late to the use of aluminium for various parts of photographic apparatus, it will be instructive to note a series of experiments made by Professor Liversidge, M.A., F.R.S., upon the effects of weather upon ordinary aluminium. He placed, in the open air, sheets of the best commercial samples, and allowed them to remain exposed for upwards of a year to the action of the atmosphere. The sheets were pressed into a cup form, to give the rain water, &c., full power over the metal. In a very short time it lost its brilliancy, and became rough and speckled with grey spots. It also became rough to the feel, and the spots distinctly projected, and were so firmly attached that they would not come off either with washing or friction with a cloth. They were presumably a hydrated oxide—in other words, a species of rust. These experiments, of course, exposed the aluminium to the air in a way that no photographic apparatus would be expected to undergo; but, at the same time, it distinctly shows the desirability of all photographic apparatus made with this metal being lacquered or varnished.

Lippmann Colour Photographs.—At a recent meeting of the Berlin Physical Society a series of colour photographs, taken by Lippmann's method, with a greatly prolonged exposure, were exhibited by Dr. Neuhaus. It was found that with sufficient exposure a greenish band made its appearance at the invisible extension of the spectrum at each end. When such objects as fruits, flowers, butterflies, &c., with surfaces of various colours, were attempted, considerable difficulty was experienced, the average proportion of successes to failures being about one to twenty-four. Dr. Neuhaus found it necessary to stain the films with eosine or cyanine in order to diminish the blue or increase the red sensitiveness. He refers the theory of colour photography to Dr. Zenker in 1868, and dwells upon difficulties in the way of accepting what is now termed Lippmann's theory. This, it is known, explains the colours as being produced by light diffraction, from extremely minute particles or plates of silver at various depths within the film; but the writer says that, though these particles ought, with the microscopic power now available, to be visible, their actual existence has not yet been demonstrated. Further, he points out that the presence in the film of granules of a diameter equal to several half wave-lengths is not reconcilable with the usual theory of colour photographs, and that there thus yet remains to be established a comprehensive theory of the phenomena.

Photographic Records of Natural Objects.—Just as it has long been recognised that one of the duties of photography was to preserve records of national monuments, the work of man, that the destroying hand of time might not erase them entirely, so does it occur to us that natural objects of great interest from various causes should also be photographed before they are lost by decay. These thoughts were aroused by reading an abstract of a paper by Mr. J. C. Shenstone in the *Essex Naturalist*, in which he also gives details and illustrations of noteworthy specimens he has met with of general interest, *i.e.*, objects outside that county. He refers to large oak trees now living. Quoting from Loudon's *Arboretum*, he gives particulars of the five with the largest trunks in Great Britain. If it has not already been done, it would be a excellent thing to take good photographs in summer and in winter of such as remain of these magnificent arboreal subjects, and, with the idea that our suggestion may be taken up, we give Loudon's list of these trees. They are: Cowthorpe Oak, Yorkshire, trunk, seventy-eight feet; Merton Oak, Norfolk, sixty-three feet; Hempstead Oak, Essex, fifty-three feet; Grimstone Oak, Surrey, forty-eight feet; Salsey Oak, Northampton, forty-six feet. Of oaks with the widest expanse of boughs we have the Worksop Oak, one hundred and eighty feet, and the Oakley Oak, one hundred and ten. Already some of these grand objects are lost to the camera, for the Hempstead Oak fell about twenty-five years ago, and nothing but a mutilated and decayed trunk remains. Some of these trees have the repute, on more or less shadowy evidence, of being from five hundred to a thousand years old.

SUGGESTIONS IN CONNEXION WITH GELATINO-CHLORIDE PAPERS.

Now that the fact has been established beyond doubt that gelatino-chloride papers have "come to stay," there is room, I think, for a suggestion or two that might have been considered premature, if made at an earlier period or when these papers were only on their trial. My remarks are addressed, through your columns, direct to the makers in no unkind or cavilling spirit, for, while from the consumer's point of view, I may be in a better position to recognise the room for the little improvements or alterations suggested, I am at the same time fully alive to the enterprise that has been shown and the generosity of treatment already displayed, and I scarcely think I am asking the manufacturers either to dive their hands any deeper into their pockets, or to put themselves to any further trouble after the first necessary alteration in routine is overcome.

The first point may at first sight appear a somewhat trivial one, and arises out of the custom, first generally introduced by the makers of gelatino-chloride papers, of issuing packets of cut sheets at the uniform price of a shilling, and containing practically the same quantity of paper. The great utility of the cut sizes when once adopted is so great that I for one am loth to go back from the system by reverting to the old style of buying by the quire, which, of course, I am at liberty to do. Not only am I saved the trouble of cutting up the paper, but, purchasing it as I do cut in the sizes I require, I actually obtain more usable paper and less waste than would be the case if I bought the whole sheets, and that even if I worked a far larger number of different sizes than I do. Indeed, it seems barely possible that the companies can make an equal profit out of the cut-sheets or packets to that required in the quire.

The packet system is all right for the amateur, small consumer, or experimenter—I was going to say "messer," for I mean the man who, at the smallest expenditure possible, wants just to try every new thing; but, to those who have settled down to the regular use of any particular brand, it matters not which, it is distinctly a nuisance to have to order by the dozen packets, where a single one would do. It does not matter so much in the smaller sizes—quarter-plate, say—but after that, when professional or larger sizes are reached, the nuisance commences, and it seems rather ridiculous to put up 12 × 10 in packets of four sheets, merely for the sake of conforming to a uniform shilling packet. Surely any one who works 12 × 10 will want more than four sheets at once, if he only buys it as he uses it. I am not a large user of that size, but I have now to complete an order for four dozen prints, which necessitates, without allowing for spoilt sheets, twelve separate packets; and this brings me to another phase of the shilling packet question.

Personally, I was brought up on a system that taught me never to cut a piece of string when I could conveniently cut the knot, and never to waste anything that might have a possible use in the future. The empty plate boxes and wrapping papers of the plate-makers are all worth saving, and all prove useful; but what earthly use can be found for the heaps of directions and advertisements that accumulate under the shilling-packet system? Take my four dozen 12 × 10; I find that, in addition to the useful portion—the printing paper—I have half a quire of good, stout brown paper, 30 × 24 inches, which will also come in for something or other in the way of wrapping. There is a pile of millboard, weighing upwards of three pounds, that may also some day be worked off for one purpose or another, but the twelve spoilt envelopes, with their handsome labels, are no use, although they have cost money; while, as for the six dozen printed papers enclosed, they represent an amount of matter that, at the usual rate of payment to favoured contributors to such journals as pay five guineas a column for contributions, must mean a small fortune wasted and absolutely useless.

That heap of stuff, as I say, costs money, and might just as well go to the consumer in the shape of usable paper in larger packets; or if it only went towards swelling the dividends, although I am not a shareholder in any of these companies, I should benefit in not having to store so much useless matter.

I do not for a moment suggest disestablishing the shilling packet system, but it might be supplemented, without trouble, by the issue of larger packets, as in the case of *carte-de-visite* or cabinet sizes. They may be like those boxes containing one gross or a smaller number with the larger sizes, or, if preferred, a fixed price of five shillings, that is a detail which need not cause much trouble, only give us the opportunity of purchasing in quantity without losing the advantage of the cut sizes.

The next point is one of greater importance, because it directly affects the cost to the consumer of the paper he uses, which might be to him considerably cheapened without in the slightest degree affecting the makers except in as far as a shilling's worth would go further. I would point out the inutility of issuing cut sizes of the same dimensions as the negatives, at least so far as print-out papers are concerned, for how is it possible, without vignetting or masking, to utilise such papers up to the edges? Except, under such circumstances, or in printing a piece out of the centre of a larger negative, it becomes compulsory to trim the prints, and, beside the trouble this entails where it need not exist, the trimmings so produced are absolute waste, for the silver they contain is literally not worth the cost and trouble of saving. With albumen paper the case would be widely different, as the clippings form a valuable portion of the residues; but here, as they are not worth saving, I should like to avoid the trouble of making them only for the sake of throwing away or burning.

More especially is this the case when these trimmings represent a very important proportion of the total contents of the packets. It has probably not struck many of the vast army of spoilers of quarter-plates that the cuttings of their prints are equal to about one-fourth of the actual picture, and that, if the paper was cut 4 × 3, instead of a quarter of an inch more each way, forty-eight sheets might be put into the packet without costing the makers a farthing more for either materials or labour. Indeed, taking the actual area, fifty-two sheets of 4 × 3 do not quite make up the sheet and a half given in each shilling packet, though only forty-eight can be cut without actual waste. If the other sizes be similarly examined, it will be found that at least one-third more can be cut out of the full-size sheets without the slightest waste, that is to say, without asking the makers to give any more than is already given for the reduced sizes in almost every case cut up more conveniently, and cause less waste than in the other.

As an instance of what I mean, taken from the published price-lists, compare the quarter-plate packet, containing thirty-six sheets, and the "special cabinet size," 6 × 4¼, containing twenty-four sheets, and each costing one shilling. If the latter be divided in half, we have forty-eight sheets, 4¼ × 3, which will still require some trimming to bring it to quarter-plate requirements, or just the one-third more than I have already spoken of. But that particular size happens to cut up almost exactly into the full sheets without any waste. Of course, in the larger sizes, such as 12 × 10, the cuttings do not bear so large a proportion to the contents of the packets as in the smaller, but the difference is still sufficiently great to form a rather important proportion of the cost where large quantities are concerned, and if larger packets were made as I suggest, and the sheets cut to trimmed sizes, I think consumers would be so much richer at the end of the year, and the producers not one whit worse off.

It is, of course, on the cards that some photographers may prefer the paper cut the full size; I admit I did so myself at first, until I got accustomed to the difference between gelatine and albumen, and learnt how to handle the former without damaging the edges and corners; but now I begrudge the time involved in the trimming. It is not that only by the way, for, unless the paper be trimmed before printing, it practically becomes necessary to dry them after washing, instead of mounting them straight away, as most prefer.

All that the makers have to do is to introduce additional sizes, for which I am sure there would soon be a demand, and only to drop the old ones as the call for those falls off, as I am equally certain it would soon do.

W. B. Bolton.

CYCLING AND PHOTOGRAPHY.

[London and Provincial Photographic Association.]

In the hope that I may be able to induce a few of the votaries of cycling to try photography and a few photographers to try cycling, I shall endeavour this evening to mention a few of my own experiences, trusting that, by so doing, I shall be able to make the path of the embryo cycle photographer a little easier.

Firstly, I shall speak more particularly to those photographers who have not yet tried cycling and shall endeavour to enumerate, a few of the advantages which the possession and use of a cycle, either safety or three-wheeler, would confer upon them. With regard to the machine, a pneumatic shod safety bicycle by any of the best makers will be found most generally useful. Bear in mind that a low-priced machine is seldom the cheapest and yet as good a one as you can afford. If you have not a cycling friend who will advise you in the choice of a mount, try the advertisement pages of *Cycling*, *Cyclist*, *Wheeling*, or the *Cycle*, whose editors are always pleased to give the novice a hint as to the reliability of any selected machine. Humber, Rudge-Whitworth, Raleigh, Premier, Mohawk, Referee, are all good, and an expenditure of about 14*l.* to 16*l.* should purchase as good and stable a mount as the most captious critic could desire.

Have pneumatic tyres by all means. With the detachable variety punctures when found, are easily repaired in a few minutes and the increase of comfort, speed in relation to power expended and absence of vibration are worth the extra outlay.

Gearing, which is the proportion which the revolution of the pedals bear to that of the driving wheel, should be rather lower than usual, as we have to carry a certain amount of *impedimenta*, and it also depends, to a great extent, on the personal strength of the rider.

Personally, I find 56 in. about right, as a fair pace can be kept up, average hills can be climbed without undue exertion, and the last few miles of a fairly long run do not tax our powers to the utmost. Weight of machine should be 28 to 30 lbs. The power to ride the modern safety bicycle is an art which may be easily acquired in a few hours with the help of a friend, or at one of the riding schools—"Goy's," in Praed-street, is a very fair example, but no doubt there are others equally good—and once learnt we have a willing horse who will transfer ourselves and apparatus, at any time we may desire, and any pace within reason, to any of the beauty spots of this beautiful land of ours, at a maximum of speed with a minimum of exertion and outlay. Do not try to carry too large an outfit, 5 × 4 is ample, and a quarter-plate much more convenient and compact.

Enlargements can easily be made from a good quarter-plate negative, where the excellence of the negative or the inclination of the photographer demands it. It it a great mistake to carry a weighty and bulky camera, &c., for not only do we waste energy in the propulsion of unnecessary weight, but we also cut down our available distance, annihilating power, thus missing many a suitable bit which we might otherwise have secured, but also cutting short time which might be better employed in exploring for suitable scenes, not to mention the usage of a reserve of strength which might prove useful in the event of bad roads or head winds, which will sometimes occur on the most carefully planned excursions.

Now a few words to cyclists who might think of taking up this enjoyable hobby. The camera I should recommend for cycling is a quarter-plate on the lines of Watson's "Alpha," with either double backs or an Adams's changing back for 12 plates, Thornton-Pickard shutter, Euryscope lens, and either a cycle clip for use on the handle bar, or a portable stand for use when a hand exposure is not available. Adams's Vesta camera should also prove suitable. The camera will travel well on a pair of handle-bar carriers, or can be slung in the diamond frame, or even behind the saddle, the stand on the handle bar or parallel with the frame—I find it carries well strapped to bottom front tube of the diamond frame—but with the plates it is a different matter, as if carried attached to the machine in the ordinary manner, the vibration will cover them with dust, causing spots in the resulting prints, and possibly a language which would be unfit for publication.

One way of getting over this difficulty is to carry them in your pockets or in a special case slung over the shoulder. But I think an improvement on this is to make a small box just fitting the number of slides you intend to carry, attaching same to the machine on the lamp bracket in exactly the same manner as the lamp is isolated. I procured mine from Fitter & Burley, Birmingham, and this, with the addition of a coil spring for strengthening purposes, I find to answer its purpose admirably. Of course, in the event of night riding, it is imperative to get an extra lamp bracket for the lamp on either head or fork extensions.

With such an outfit, weighing with four slides something over four pounds, we can travel comfortably all day, stopping when we discover a particularly pretty or picturesque bit of woodland, rustic cottages, or other scene that we might wish to transfer to our album of reminiscences. To unstrap camera, expose and pack up again, is merely the work of a few minutes, and we are then fit for further travels. I would suggest that the photographic tyro should commence with the camera affixed to the stand; when fairly experienced, then is the time to try what can be done with the camera held in the hand and instantaneous exposures of moving objects. Plates can be changed at night, using your cycle lamp for the purpose, making the light safe with a sheet of orange paper rolled up in the form of a large tube and putting the lamp inside. A flash lamp and a little powdered magnesium will also frequently be found useful at a club run and add to the interest of the excursion. In conclusion, I trust that some of my hearers and readers may try the cyclo-photographical combination, and I have no doubt that, should they do so, cyclists will find an added interest to their runs, and photographers a new power in the cycle.

E. H. Bayston.

ART AND PRACTICE OF COLLOTYPE.

[Edinburgh Photographic Society.]

Without entering upon the tedious historical development of the process, let it suffice to remark that collotype has steadily advanced from the crude results of the early experimentalist to the perfection of artistic illustration attained by some operators of this and other lands. We cannot, in fairness, give pre-eminence to the name of any man as the inventor, for it is the product of many minds, the growth of many lands, till now it has taken root in all civilised countries, and is even found thriving in exclusive China, and Japan, the Britain of the East. Of all the ink-photo processes, collotype yields the most excellent results, binding in one the softness of the photographic image, and the permanency of the engraving or lithograph; and, although rivalled in measure by the grain or stipple photo-lithograph and process blocks, still there is a mechanical look about them that collotype does not present.

There are some points of resemblance between collotype and lithographic printing, namely, in respect of etching and inking the image; but it is a purely photographic process in the earlier stages, and a negative must first be produced and the image transferred through it to the printing plate. This, properly speaking, is a delicate film of gelatine, which is held in position during printing operations on a glass or copper plate. It may be held by paper, cloth, or zinc, but glass or copper is mostly used. As to gelatine, different operators have each their preference for certain sorts, and the same may be said regarding the three salts of chromium commonly used as sensitisers. Natural or artificial light may be used for transferring the image to the printing plate, but the former, as a rule, gives softer and more lasting results. After the image is copied through the negative on the printing plate, it is washed in running (or several changes of) water and dried. It is then ready for the printing press, and, after soaking for about an hour, it may be charged with printers' ink and an impression printed off on paper. Printing by power machines is, one can easily understand, more complicated than by hand press; but, though more difficult at starting, there is greater regularity and more speedy results than by hand, while the quality of work by a careful machine-minder may be maintained equal to press work. Taking this as a general outline of the process, we may, so far as time permits, examine some of the details. First, regarding negatives, it is of the utmost importance to have negatives suitable for the process. It is like a mariner attempting to navigate a ship minus compass and helm, for any one to attempt collotype work without a good negative. For this class of work they should be soft without flatness, and brilliant without being over-dense: veil or fog at discount. They may be produced by the wet or dry-plate process, the former being preferable for reproduction work. If ordinary photo-negatives are already token, they may be stripped from the glass by the acid process, or a carbon transparency made from which a contact dry-plate negative can be obtained to ensure reversal of image. All collotype negatives must be reversed, and in wet plate this is effected by either flowing over the finished negative with a solution of gelatine, which is dried spontaneously and stripped off, bearing the collodion negative image with it; or a sheet of gelatine the size of the negative is squeezed on it, and when dry lifted off in like manner. These film negatives are most useful when more than one picture is to be transferred on one printing plate (for reproduction on one sheet). As regards the production of negatives, time will not admit of us explaining the different changes which take place in the organic and metallic compounds in ordinary light, or of the nature of the salts of silver incorporated in the gelatine of dry plates, or absorbed in the collodion of the wet plate; suffice it to say, that the knowledge of the different chemical actions of the various agents used gives the operator power, by judicious choice and mixture, to produce negatives suitable for the process for which they are intended. If the negative is to be used without stripping the film off, the glass must be flat, otherwise one cannot get contact, and the resulting picture will be unsharp. As regards retouching negatives, there are some subjects, oil or water-colour paintings, which, owing to composition and colour, or defective lighting in cases where one is not permitted to remove them from a gallery, yield faulty negatives. Here a skilful retoucher, with a knowledge of the original, by careful work on face and back of the negative, will attain a presentable result when least expected.

In photographing oil and water colours for chromo-collotype, the negatives require careful retouching to yield satisfactory results, even after the light has been filtered through the screens used to obtain negatives for each of the three primary colours. It is hardly necessary for me to say more regarding negatives, so we may proceed to explain the preparation of the collotype printing plate. Ordinary polished plate glass, varying in thickness from a quarter to half an inch thick, is commonly used for holding the gelatine film, and is usually ground on one surface with finest flour emery dissolved in water, so as to form a syrup like thick cream. This is poured in a small pool on the glass plate, and then with another plate short cross motions are given, as is done by lithographers in graining stones, and the grinding continued till all the plate has a fine even matt surface. Then, when this is complete, the glass is thoroughly washed, to free it of all trace of emery, and dried. The plate is then ready for the substratum, which may be either chrome albumen or chrome gelatine, or a compound of both; but a simple form is water-glass, water, and albumen, in the proportions of 10, 250, 20. Plates covered with this preparation will keep for some time, or they may be used when dry for the second preparation or printing surface, after being washed with cold water and dried. This second coating, or printing film, may be composed of water, gelatine, ammonium bichromate, and spirits, in proportions of 500, 40, 10, and 15. Nelson's No. 2 Photographic is first soaked in cold water for ten or fifteen minutes, then dissolved by heat, when the bichromate is added, and when this is well mixed the warm spirit is poured in slowly, with constant stirring. This composition is filtered and poured on the plates, which must previously be levelled and warmed in the drying box, and when all the plates are coated, the lid, or cover, is closed, and the temperature maintained at from 40° to 50° C. for a period of from one to two hours.

The drying stove, or oven, is a rectangular box, varying in size according to requirements, having a sheet-iron bottom (if the source of heat is gas burners placed beneath it), with a hinged open frame lid. This lid is covered with two layers of, say, black calico, with a layer of blotting-paper between, and has a hole in the centre for a thermometer, by which the temperature within is ascertained without opening the stove. Further, the iron rods with the thumb-screws, for levelling the plates, rest inside on fillets, on each of the two sides, about eight inches from the top of box. The source of heat may be either gas, steam pipes, or hot-water pipes, as may be most convenient.

The plates, prepared as aforesaid and dried, may be used as soon as they are cool, or may be kept for a few days and used as required, only they must be shielded from actinic light.

We now treat of transferring the image from the negative to the printing plate, which operation to a collotypist is analogous to a type printer making a "stereo" cast of type or cut, or a lithographer transferring from an original to a working stone for machining. To effect this, the reversed photographic negative is put in a strong printing frame, faced with three-eighths or half-inch thick glass, a cut-out tinfoil mask the size of image required pasted on it with indiarubber solution, and the prepared plate laid down on this. It is now wedged up or screwed firmly,

and exposed to diffused light for a long or short period, according to quality of light and density of negative. When the exposure is judged to be correct, the plate is washed in running or several changes of water, till the unaltered bichromate is washed out, and then set aside to dry spontaneously. There are different methods of hardening the film; a formula used in France is—

Water	100	grammes.
Chrome alum	4	,,
Glycerine	100	,,

Soak five minutes, and follow by—

Etching fluid	300	parts.
Water	700	,,
Glycerine	30	,,
Liquid ammonia	880	,,

For about an hour. Some Germans use—

Glycerine	430	parts.
Water	150	,,
Liquid ammonia	100	,,
Potass nitrate	24	,,

Time varied according to exposure. In America, tobacco juice is used in the soaking fluid. There are also a number of other agents used in conjunction with glycerine, considered by those who work the process practically to exercise a beneficial action on the printing film. As the basis of collotype is the sensitiveness to actinic light of any of the bichromates when mixed with an organic substance such as gelatine, and the fact that films so sensitised will, when exposed to light, lose their power of absorbing moisture in proportion to the amount of light reaching them through a negative, or other means, so also it may be inferred that when such plates are soaked in water or the glycerine compound, they will refuse to take ink from a charged roller on the whites of a transferred image, will receive it in the darker portions, and will yield beautiful half-tints, according to the skill and experience of the printer. The collotype plate being very sensitive to atmospheric change, and very liable to be destroyed by grit in the rollers, &c., extreme care must be exercised in the printing to ensure the best results. As regards presses for use in printing, there have been many different forms employed, and from all good results may be obtained; but probably the best is the cylinder, for then the paper is held in position by the grippers, and is only in touch with the plate at point of contact for a short time, consequently there is less moisture absorbed than in presses where the paper lies on the plate in parts, and is free from it in others while the carriage is put out and in, and the tympan lowered and raised. With it there is also less chance of halation at the edges and dark markings in the centre. Cylinder-pressure hand presses appear to be better adapted for this class of work than those with either platten or scraper. The press before us is known as a platten press of the Albion type, and from it we hope to give a demonstration of printing. The pressure is brought to bear upon the printing surface by means of this lever, which lowers the platten with sufficient force to press the paper into the plate, and so secure an impression. The plate before us is of three-quarter inch polished plate glass, but this is so prepared that there need be no alteration of the press. Thinner glass would do, but in that case a false bed of iron would have to be used to raise it up to the necessary level for printing. In collotype the image is in intaglio on the plate, not in relief, so one has to use a little more pressure than for letterpress printing, but, owing to the soft elastic nature of the film, less pressure is needful than for lithographic printing. In order to reduce the pressure to a minimum it is customary to use an overlay the exact size, or but slightly larger, than the image to be printed. This concentrates the pressure, and is helpful in many ways to the printer. The frisket mask or shield is used to ensure clean margins, free from scum, and may be made with thin post paper, coated with thin linseed oil or terebin. The plate as it is handed to the printer is first washed or soaked in cold water for from five to fifteen minutes, then carefully levelled, and covered with a mixture of glycerine and water for at least half an hour. The object is to impregnate the plate with a slow-drying compound which will repel printing ink from the portions of the plate unchanged by actinic light, and proportionately from the half-tints of the photographic image, and which in turn, being repelled from the oxidised portions, will permit the greasy ink to adhere to those parts—in the depths of the image fully, and in the half-tones partially—thus yielding the soft pleasing prints devoid of an intermediate screen, as is the case with all classes of block work for letterpress printing.

A collotype plate produced from a good negative with the correct exposure in transferring the image should give from twenty-five to 100 impressions in the hand press, without further soaking, according to the quality of the paper, the temperature of the room, and the skill of the printer.

The printing ink, reduced to the proper consistency, is laid on the roller and distributed evenly over the slabs, after which the plate is carefully inked up with a smart heavy roll at first, for the tendency is to receive rather much ink at first, and often one has to give it some soaking with ammonia etching solution. However, if the plate takes ink correctly from the leather roller, the composition roller is passed over it, and a rough print pulled off. This serves for a guide as to size of overlay and mask.

The overlay is pasted down in position on the tympan, the mark arranged on the frisket, and as soon as the plate is worked up to the standard of excellence the printer proceeds to work off the edition.

Wm. A. Denovan.

SOLARISATION: A LECTURE EXPERIMENT.

The following experiment affords such a striking lecture illustration of the solarising action of light on a photographic plate that I thought a description of it might be of interest.

An ordinary Ilford plate is first exposed to gaslight for a few minutes, so as to thoroughly fog it; a stencilled pattern or other design cut out in opaque paper is then placed in close contact with the film, and the plate is exposed for a few seconds to the magnesium light, or to diffused daylight.

At this stage, and before development, the plate may be examined by gaslight, when it will be seen that the parts which have received the second exposure are considerably darker than those which have been protected by the pattern, the latter being clearly visible in the lighter colour of the original film. The plate is next developed with alkaline pyro; this process may be carried out in full gaslight if desired. The patterned portions now develop and rapidly attain full density, whilst the over-exposed parts (which were before darker than the rest) resist development, and in fixing come out transparent. Experiment showed that precisely the same effect was produced, whether the plate was protected from gaslight after the second exposure and during development, or was treated as above. It was also found that the solarising effect produced by say ten seconds' exposure to intense light, was not followed by any further changes when the exposure was continued for a much longer period (forty-five seconds). The experiment may be varied by substituting a negative for the pattern; a second negative is thus obtained, in which not only the main lights and shades, but also the half-tones, are well represented. In this case, however, the plate must be protected from light after solarisation and be developed in the dark room, otherwise the half-tones will suffer.

Two points seem to deserve notice in considering the cause of solarisation in this experiment. The first is that the solarised portions of the film, being darker in colour than the unsolarised parts, would appear to have suffered most decomposition, although no longer capable of development. The second is the fact that the solarised film is no longer sensitive to light. Thus it would seem that the explanation sometimes put forward, to account for solarisation on the supposition that rehalogenation has occurred, is in this case untenable, for if it had been so—that is to say if the silver bromide reduced by the first exposure was again brominated by the second, and so converted into the normal bromide—one would not expect to find it darker in colour than the original compound; or is it to be supposed that it would be no longer affected by light (such as gaslight) to which it was in the first instance sensitive?

I am not, however, myself prepared with an explanation of the phenomena, but must leave it to others more capable of dealing with the problem.

Arthur Richardson.

MODERN PHOTOGRAVURE METHODS.

[Journal of the Society of Arts.]

If I take a piece of polished metal, such as I have in my hand—copper, for instance—and draw a design upon it, and then remove all the metal round and about the design, so as to leave the latter standing up above the general level of the copper, we shall have in its simplest form a typographic block. Such a block, when mounted on a piece of wood so as to bring it what is called type high, can be inserted amongst type, can be printed simultaneously with letterpress, and constitutes the basis of the illustrations which we see in books and newspapers. The various methods by which such blocks are made may be described as relief processes, because in them the design or picture is in relief.

If, on the other hand, I take this same piece of copper and, instead of drawing and designing upon it as before, I scratch with a sharp instrument, such as a graver, a series of lines, I have, in its simplest and most elementary form, an engraved plate. Such a plate is no longer capable of being inserted amongst, and printed simultaneously with, type. It requires a different class of ink, different paper, and a different press in which to take off the impressions.

From the earliest days of photography it has been the constant endeavour of experimentalists to utilise the photographic image for the production of printing blocks, and during the last half-century many important inventions having this end in view have been made.

It is not too much to say that at the present time, in regard to book and newspaper illustration, photography is almost exclusively used in the construction of the printing blocks, while in its more pictorial and artistic aspect, *i.e.*, in the manufacture of etched plates, it is now largely doing the work which at one time was exclusively the province of the etcher or engraver.

The title of my paper, which is that of modern photogravure processes, will not allow me to linger any further over the subject of modern relief processes, fascinating as it is. The field covered by these processes, the enormous advance which has been made in them during the last few years, and the influence which they will have on the future of journalism are subjects of the very deepest interest.

I have already pointed out that the method of printing a photogravure, or engraved plate, differs essentially from that of a relief block; and it would be well, before describing how such plates are made, to familiarise you with the appearance of a photogravure plate, and to describe to you the method in which it is printed.

In printing an engraved or etched plate, such as a photogravure plate, the plate is slightly warmed. It is then dabbed over very thoroughly with a stiff ink, known as copper-plate ink, until the plate is completely covered and exhibits nothing but a uniform black surface. The printer then proceeds, with the assistance of a large roll of muslin, and working with a circular motion, to remove all the ink from the surface of the plate; he finishes it by working it with the palm of his hand, and having carefully cleaned the margins with chalk, it is ready to print. It is now placed face upwards on the plate of the press, a piece of paper of special quality —which has been damped and kept under pressure for a time, so as to make it moist throughout—is laid upon it, and the plate and paper are passed through the rolls of a press. The pressure of the roller, which is very considerable, is distributed over the back of the paper, by the interposition of several thicknesses of fine and coarse blanketing. The paper is lifted gently off, and we have now an impression in ink, in thickness corresponding with the actual depths of the various parts of the picture. The picture is really a cast in stiff ink, showing in varying thicknesses of ink the varying tones of the picture.

Briefly speaking, this is the method in which an intaglio or photogravure plate is printed, and the method applies to every form of engraved plate, whether produced by photography or otherwise.

You will no doubt have imagined to yourselves, from what has been described, that the surface of a photo-etched plate consists in a number of depressions, deep where the heavy shadows are, less deep in the half-tones, until we reach the level of the original copper, which represents the high lights.

To a certain extent, this is correct; but were it absolutely true, the making of a photogravure plate would be a much simpler matter than it really is. Such a plate, however, would be useless, because it would not yield a print at all, and for this reason, the surfaces etched are large; the depths of etching are extremely small, and so also the difference between the depth of the tones. The consequence is that, although it would be easy enough to cover such a plate with ink, the roll of muslin would inevitably wipe out all the ink again from these shallow depressions. It is therefore necessary to break up, by some means or another, the whole surface of the plate, so as to form not only large areas of shallow depressions, but to cover these portions with a series of honey-combs, or cells, which shall imprison the ink and resist the tendency of the muslin to sweep it out.

The means by which these cells or honey-combs are formed are called the grain, and the matter is one of the deepest importance, because the success of the resulting picture, the superiority of one process of photogravure over another, depends very largely indeed on the question of grain.

There are many methods in which a grain is imparted to a plate. Its action consists in protecting the copper, wherever it exists, from the action of the etching fluid. The etching goes on amongst and around the grain, but, wherever the small particles of grain exist, a small pinnacle reaching to the original level of the copper is maintained, and thus forms the honey-combs or cells described.

No half-tone intaglio plate can be printed at all unless it possesses a grain of this sort. An artist's etching, with which you are all familiar, is composed of lines entirely, and these lines being deep and narrow, there is no tendency of the muslin to wipe out the ink. In the case of a mezzotint plate, however, a grain is given by means of a rocker. The plate is, previously to its being worked, pitted all over and in all directions with a toothed instrument known as a rocker, so that, if inked up, it gives one uniform black impression: the half-tones and high lights of the picture are afterwards put in by means of a burnisher and scraper.

You will seen, in the diagram which I now show on the screen, the appearance of a photogravure plate if it were prepared without a grain. The second picture shows a plate which has been grained with the picture over it, and the third a typical section of an etched photogravure plate.

I also show on the screen a slide exhibiting the actual grain itself. In the process which I am about to demonstrate to you, the grain is given by allowing a very fine dust of bitumen to settle all over the plate. The plate is then treated sufficiently to attach these tiny particles to the plate, and they protect the copper wherever they exist from the action of the etching fluids.

In order to get the finest results from photogravure, it is obvious that we ought to have the means of etching as deeply as we can in our deepest shadows, but in doing so a practical difficulty comes in. In proportion as we etch deeply so we etch laterally, and, if the etching is carried beyond a certain point, a danger arises of carving away the summits of these important little pinnacles of grain on which the whole success of the printing depends. The coarser the grain is in the first instance the less is the danger; but, inasmuch as the beauty and delicacy of a proof depends on the grain being as fine as possible—because each of these little points prints as a white speck—it is clear that the ideal grain is one which shall be graduated in coarseness, in proportion exactly to the depth of etching which it is to represent. That is to say, we require, to produce the finest results, a discriminating grain coarsest in the deepest shadows, finest in the highest lights, and graduated throughout the picture, and I shall presently refer to certain methods in which a discriminating grain forms part. This question of discriminating grain is one to which a great deal of experimental work has been devoted.

The question of grain, generally, is of so much importance that it dominates all other considerations. Every advance and improvement that has been made in connexion with the methods of intaglio work have depended upon this special factor. In the editorial article of The British Journal Photographic Almanac of 1893, Mr. Traill Taylor puts the matter very clearly. He says:—

"In truth the subject is of great importance, for whereas it is by no means difficult to convert a negative having lights and shades into a surface having such lights and shades converted into reliefs and hollows, it is not always easy to impart to a printing surface of this nature such a degree of granularity as on the one hand will hold enough ink as to enable a good impression to be obtained therefrom, or on the other hand to give it so pronounced and coarse a grain as just stops short of destroying all the fine details. Large industries and vested interests depend upon this matter of grain, to the successful selection or application of which several firms are indebted for their eminence."

The possibility of utilising the methods now in vogue for the production of screen negatives appears to be of special interest in this matter, and indications are not wanting that, perhaps in the near future, transparencies broken up by means of a screen might be used and an artifisial grain obtained by these means.

There are many methods by means of which photogravure plates can be made. The Klic process, of which I propose to give a practical demonstration later on, is, owing to its simplicity and the results which it gives, very largely used both in England and all over the Continent. You will see round the walls examples of work by several English as well as Continental firms, and I have no doubt that many of these are done by the process in question. Briefly speaking, in the Klic process a transparency is employed, and a print from this is made on carbon tissue. For the information of those who do not know what is meant by carbon tissue, I will explain that it is paper coated with a solution of gelatine containing bichromate of potassium. This salt invests the gelatine with the extraordinary property of insolubility after exposure to light. If, therefore, paper so coated is exposed under a negative or transparency, the gelatinous film is rendered insoluble, in proportion to the intensity of light action; and when it is soaked in warm water, owing to the dissolving away of the portions unaffected or less affected, a picture in relief is obtained in which the shadows are either depressed or elevated, according to whether a transparency or a negative has been used.

In the Klic process, the copper plate is grained, the carbon exposed picture is mounted on its surface, and, after development and drying, the picture is etched by means of perchloride of iron. There is no means in this instance of giving a discriminating grain.

A method described by Bonnet in his book, *Manuel d'Héliogravure*, published by Gauthiers-Villars & Company, of Paris, and which, with some modification, I have worked myself, consists in the following: A copper plate is coated with the bichromatised gelatine solution and dried over a heated surface, by means of a whirler. It is then exposed under a transparency, and, after exposure, is developed in warm water. When it is considered to be sufficiently developed, because no image is visible, I soak it in a solution of Judson's violet dye, and this will bring out the picture. It is then grained over the film, after it is dry, and, in the first instance, a somewhat coarse grain can be given. The picture is then etched, the shadows will be first attacked, and, after a certain time, the etching is arrested, and the film is cleaned off. The whole operation is repeated, and a finer grain given, when the etching is carried somewhat further, and, for the third time, the grain given is very fine, and the etching carried to conclusion. Careful methods of registration are required. You will see that in this case a discriminating grain is rendered possible. The process, however, is much more tedious than the Klic process, but it contains the germs of success.

The methods to which I have referred consist in the etching direct of a copper plate, through a photographic picture previouly mounted on its surface. There is, however, another class of methods, which consist in building up a plate upon a relief by deposition of copper in a battery. Colonel Waterhouse published some fifteen years ago a method of doing this. A gelatinous film, which has been exposed under a negative, and in which, therefore, the portions representing the shadows are raised, while the high lights are depressed, is sifted over, while still wet, with sand. The sand is prepared previously, by heating it with wax, and

stirring it until cold, so that each grain of sand is enveloped in a coating of wax. The grains of sand sink more deeply into the thick parts of the gelatine picture and less deeply into the thin parts, so that when the film is dry and the sand is brushed out, the picture, as represented by the film in relief, is pitted all over with a grain, coarse in the shadows, and getting finer as it approaches the high lights. The film is then rendered conductive, by brushing over with plumbago, and a copper cast is formed by it in a battery. The cast forms the photogravure plate.

There are many other processes other than those I have mentioned for the production of photogravure plates, and I would refer any one interested in the subject to the editorial article of THE BRITISH JOURNAL OF PHOTOGRAPHY for 1893. I am indebted to the excellent description, given there by Mr. Traill Taylor, for such information as I do not possess from practical knowledge.

I should like to take this opportunity of congratulating this Society on their action in offering certain prizes for the encouragement of photogravure in this country. The world has been largely indebted to the efforts of an Englishman, Mr. Fox Talbot, for the advance in the methods of producing photogravure plates; and it seems strange that at the present moment the English market should be supplied almost entirely by Continental productions. The works of Messrs. Goupil, the Berlin Photographic Company, M. Dujardin of Paris, Dr. E. Albert of Munich, Paulusen of Vienna, and others, are to be seen everywhere, but, up to the present, English firms have hardly entered into the arena, in spite of the magnificent paintings in our national collections waiting to be reproduced.

I propose now to proceed with the demonstration of the Klic process of photogravure.

The negative selected for reproduction should be as perfect as possible; but, inasmuch as a reversed transparency is required, it is usual to make this by means of the carbon process. The tissue known as transparency tissue, and sold by the Autotype Company, either in a sensitive or unsensitive condition, is the best to employ.

I prefer to purchase the tissue in its unsensitive condition, and sensitise it myself as required. This is done in a three per cent. bath of bichromate of potassium, and the tissue is then dried on plate-glass in a drying box. The ventilation of the box should be such that the tissue will dry in about five or six hours. The negative is masked, and the tissue exposed and printed. The exposure depends, of course, on the density of the negative, but it is generally somewhat long, owing to the large quantity of pigment contained in the gelatine. The tissue is mounted on glass and developed, and, when dry, is masked in the same way as the negative.

The picture, which is to be mounted on copper, and which is to form the resist through which the etching takes place, is also printed on carbon tissue, but in this case we use either one of the ordinary brands of carbon tissue, such as the standard brown or the purple, or, in preference, a special tissue made by the Autotype Company, and known as autogravure tissue. This is printed under the transparency, and, in order to ensure as correct an exposure as possible, a trial print is made and mounted on matt opal glass. An inspection of this after development will show if the correct exposure has been given. The picture is of course negative in character, having been produced from a transparency.

The copper to be used should be manufactured out of specially good metal, be highly polished, without flaw or scratch, and should be bevelled. Such plates can be obtained all ready prepared, and cost about a penny per square inch.

The plate is cleaned by means of a soft pad of prepared cotton wool moistened with a cream of double-washed whiting made into a paste with water containing a little dilute ammonia. The solution should not, exceed five per cent. in strength. The plate is cleaned by circular rubbing. The whiting is either washed off or wiped off with cotton-wool, and it is well to put the plate into water containing a few drops of sulphuric acid, say one drachm of acid to one pint of water. Wash and dry the plate, and it is ready for graining.

The grain commonly used is powdered bitumen, although any gum which can be reduced to a very fine powder and which will resist the acid is suitable. Powdered resin can be used, and it has been recommended to use a mixture of resin and bitumen, but since the plate has to be heated and these gums melt at different temperatures there is a difficulty in fixing them both on the plate, at least by heat.

A box containing the grain, such as you see here, is revolved slowly in order to set all the dust in motion. The sides and top are well struck to detach any particles which may adhere, and which would cause trouble by dropping on the plate while in the act of graining. The box, after fifteen to twenty revolutions, is brought to rest, and allowed to rest for a time before the plate is inserted. The period of rest determines very much the character and coarseness of the grain. The heaviest particles fall first, and if the box is allowed to rest for, say, one minute before the plate is inserted, the grain will probably be pretty fine, but a few experiments will soon show. It is allowed to remain in for some three or four minutes, and is then removed. The plate, it should be said, should be inserted in the box resting on a glass plate larger than itself, and be supported a little above the bottom of the box.

Probably one graining will be insufficient, and it will be necessary to repeat the process perhaps twice before enough grain is on the plate. It is well, when first starting the process, to put on a fairly large quantity of grain, so as to be sure of not running a risk of biting away the grain. The plate is now nipped in a hand vice or pliers, and heated over a gas flame until the grain is heated, and has tacked itself on to the plate. This occurs when the plate appears, when looked down upon, to have lost all its grain, and, when examined by reflected light with the eye low down, appears a steely grey. The plate is allowed to cool, and the negative carbon resist previously described is then mounted upon it in the ordinary way. When mounting the tissue, allow it to soak very thoroughly before squeezing it on to the plate.

After it has been squeegeed, put a few sheets of blotting-paper over it and a heavy weight, and allow it to rest for a quarter of an hour or twenty minutes; more won't hurt.

It is then developed in water at about 100° Fahr., the temperature of the water being raised to 110° Fahr. while the back is stripped off. Develop thoroughly, so as to get rid of all insoluble gelatine, and then allow it to dry spontaneously, or else dry off by methylated spirit.

When it is thoroughly dry, and this is an important point, it is ready for the margins. The marginal lines are ruled with an ordinary engineer's pen, charged with stopping-out varnish, and the edges and back carefully painted.

The plate is now ready for etching. The mordant consists of perchloride of iron. It is used in solutions of varying strength, determined by means of a Beaumé hydrometer. The solutions generally used range from 43° Beaumé, being the strongest, to about 30° Beaumé, being the weakest, and some five solutions of strength, say 43, 40, 38, 34, 30, may be used. When first made up the solutions act too energetically, and the older they are the better probably will they work. Any how, when you get a set of solutions that are working well, you may look upon them as valuable. It is well to add, say, five per cent. of methylated spirit to each solution. It works then with greater regularity. The action of the etching is as follows:—The negative resist, which is on the copper plate, consists of varying thicknesses of gelatine. In the shadows the film is extremely attenuated, in the high lights it is at its thickest.

A solution of perchloride of iron, graduated to 43° Beaumé, can only penetrate the very thinnest solution of gelatine. If we start, therefore, with this, it will, provided the film in the deepest shadows be sufficiently thin, commence to penetrate and attack the copper underneath. It is left for, say, one minute after the etching is commenced, when it is poured off and the next weaker solution used. This having greater penetrating power will attack the next tones, while, at the same time, it cumulates the etching in the deepest shadows, and so on, each solution as it is put on bringing out fresh detail, and, at the same time, increasing the work done by the previous ones. The total time of etching will vary from ten minutes onwards, but the exact time which each solution is allowed to act depends on a variety of considerations, and the exact knowledge can only be acquired by practice. It is a good rule to allow each solution to act so long only as it finds out and brings out fresh detail. So soon as its action appears to cease, and it appears to be only etching downwards instead of onwards, it is time to go on to the next. The last solution will bring out the sky, and the picture will apparently blacken all over. It is then time to take it out and plunge it into a bath of potassium carbonate and water. This converts the perchloride into carbonate, and the film can be well rubbed off with the finger. The plate is then well washed, dried, and cleaned off with benzole, which will remove the bitumen. Follow this with turpentine on cotton-wool, then a little methylated spirits applied in the same way, and, lastly, clean with the weak ammonia solution and a little of the whiting cream. Use it very thin, so as not to rub down any of the fine detail, wash the plate, and immerse again in the weak acid, as at first, and your plate should be then ready for printing.

A little dry whiting rubbed over the plate with the finger will adhere wherever ink will, and will give you some idea of the printing value of your plate.

I have also to express my best thanks to a number of English and Continental firms who have been kind enough to come forward and lend me specimens of their work for exhibition to-night. To the Autotype Company, of Ealing; the Swan Electric Company; Messrs. Walker and Boutall; Mr. Dawson, of the Typographic Etching Company; and, amongst Continental firms, Monsieur P. Dujardin, of Paris; the Berlin Photogravure Company; and, last, Dr. Eugène Albert, of Munich. The latter gentleman informs me that he was the earliest worker of photogravure on the Continent. Messrs. Penrose and Company have been very kind in lending me some apparatus, and I desire also to thank my friend, Mr. Malby, who has given me valuable assistance this evening.

Discussion:—

Mr. W. Boutall said there was one matter on which he should like to say a few words, which had been alluded to in the paper, and another which had not been mentioned. The first point was the suggestion for utilising in photogravure the same kind of screen as was now used for relief work. To this there were two or three objections. In the first place, they knew that its use was interfered with by the texture of the original painting or drawing from which you were working, and, in its turn, the screen operated so as to modify or destroy that texture; secondly, he doubted very much if it would be possible to obtain a satisfactory screen sufficiently fine for use by this method; and, thirdly, assuming these

two difficulties to be got over, it seemed to him there would be a great objection on the score of the monotony which would be imported into the result. So far as relief work was concerned, a screen was useful, because you had to create a printing texture which could be used in a typographic press; but that was a much rougher mode of printing, dealing only with the surface of a block. Copper-plate printing allowed of more refinement and delicacy than any process of relief printing, and therefore he thought there would be a loss rather than a gain if they abandoned the charm and delicacy due, in a large measure, to the irregular reticulation produced by the accidental deposition of points over a plane surface, such as was given by bitumen or resin, and there would be no compensating advantage in the uniform reticulation which a screen would give. Another point was that such a screen would have to be used in combination with the negative, and that, he thought, would be fatal. The other matter, on which Mr. Wilmer had not touched at all, was the amount of retouching or additional work beyond that due to the mere photographic reproduction which a plate should receive. Theoretically, it was possible to make a perfect plate by means of photogravure alone, and, by careful steel facing, to obtain impressions from it; but, in order to obtain a really satisfactory printing plate, which could be handed over with confidence to a printer to handle as he chose—and very often he handled in a fashion which the maker would hardly approve—it was necessary to proceed rather farther in the direction of biting than would be necessary where only a few impressions were required. This opened up a very large question with regard to the reproduction of subjects which were in colour in the original, and it seemed to him absolutely essential that, in such cases, a certain amount of retouching should be allowed. You had to obtain the translation of colour into monochrome; you could get it to a certain extent by the orthochromatic process of photography; but that did not get rid of the difficulty entirely; you only had a translation, and probably you would get certain values, and have to ignore others. In such a case some working up of the plate was necessary; there were other cases in which slight accidents might occur, arising, perhaps, from purely photographic defects, not sufficiently serious to spoil the plate altogether, but which would be serious blemishes if not removed. The paper, as a whole, had been most interesting, and the demonstrations very satisfactory.

Mr. W. England asked if any of the gelatine was washed away when the picture was placed on the plate.

Mr. Wilmer said yes, it was developed in the ordinary way.

Mr. E. G. Shepherd asked if the solution was neutralised before etching.

Mr. J. Codd inquired how many prints could be obtained satisfactorily from such a plate as had been produced.

The Rev. F. C. Lambert asked if any explanation could be given of those difficulties which every beginner experienced, which were known as "devils" or craters. He had made a point of inquiry about this of every one who had any experience, and found great differences of opinion on the subject. He had been experimenting himself, and had formed a sort of provisional theory, but it was still very hazy, and he should be glad to know if Mr. Wilmer could throw any light on the matter.

The Chairman said this process was known by a great many names, such as photogravure, autogravure, heliogravure, and photo-etching. The subjects touched upon by Mr. Boutall were very interesting, but he believed the use of ruled screens in connexion with an intaglio process was not only practicable, but had been practically carried out. A short time ago he was examining some photogravures, and was a little puzzled to notice a peculiar but not very conspicuous cross-line appearance all over the picture, and could only come to the conclusion that it had been produced by a line screen. But, on examining it with a microscope, he also found a grained appearance, and therefore believed they were produced by a combination of the bitumen grain and a ruled screen, and he did not see any difficulty in such a use. This was a subject on which Mr. Warnerke might perhaps have given them some information; and he might also have told them something of his own intaglio method of using silver salts instead of chromium salts, a silver paper being squeegeed down upon the copper instead of a carbon tissue. He would ask Mr. Wilmer whether he ever adopted the method of rolling up and rebiting, and if he had had any difficulty from the film splitting off the plate. With regard to retouching plates, there was a great deal to be said for it from a commercial point of view, but photographers certainly ought to aim at getting a process which was capable of turning out perfect work without any subsequent touching up of the plate. Any such work must vitiate the result, to a certain extent, as a rendering of the character of the original picture. Orthochromatic methods, he thought, would meet the difficulty of rendering a picture in monochrome almost to perfection. Of course, little differences of colour would occur; but, after all, the photographic representation would be found to be more true (if it were measured scientifically) than the best hand work in black and white.

Mr. Wilmer, in reply, said he had never had any difficulty with films leaving the plate, but he knew that many workers had; for instance, Mr. Denison, of Leeds. He attributed it to the fact that he dried his carbon tissues in a room, whereas he (Mr. Wilmer) always used a drying box, where they did not take more than five or six hours. It was not possible to dry the tissue in a room in so short a time. He had not said anything about rebiting, but, no doubt, in the hands of a professional man this power was one of great value. If the grain would stand rebiting, there was no difficulty in increasing the printing power of the plate, and improving it very largely in that way. Whether the Chairman included rebiting amongst the objectionable manipulations of the plate he did not know, but probably there were few plates met with in commerce which were not rebitten. With regard to "devils," they were the bane of every photogravure worker, and he did not know any one who had not been worried by them at one time or other. They consisted of deep cavities, sometimes round, but often the shape of a star-fish, mostly in the deep shadows, but sometimes all over the plate, which, of course, printed black. He had not been so fortunate as Mr. Lambert in being able to formulate any theory as to their origin; he could only say that he knew pretty well, by a sort of intuition, when he was going to get them and when not. There were certain cases in which he thought he had been able to trace the cause, to a certain extent; that was when he was using plates which had been cleaned and polished a second or third time. Mr. Ernest Edwards, the President of the New York Photogravure Company, had a good deal to say about devils, and he had evidently formed a theory about them; but, strange to say, the chief etcher of the firm was of exactly the opposite opinion. Mr. Edwards told him they never got one on an ungrained plate; the chief etcher thought it was caused by the solution becoming acid, and, whenever he found an inclination to produce devils, he put a little iron in to rust it up a bit. He did not think any complete explanation had yet been given. Such a plate as he had produced might give fifty or sixty impressions without being seriously damaged; but, as a matter of fact, professional workers hardly dared take a proof impression off a plate without having it steel-faced; and it was certainly not advisable to print more than two or three before that process was gone through. The solutions were neutralised with oxide of iron in order to destroy the acidity of the perchloride of iron. As the solutions get older, and had been used more and more, the liability to develop "devils" decreased. They were put into a large enamelled saucepan, and the oxide stirred in and allowed to simmer, and then filtered. In addition to that he added about five per cent. of methylated spirit, which resisted the action of the acid, and prevented it attacking the film so rapidly. With regard to retouching, he agreed with the Chairman. As an amateur, he had not the opportunity of retouching, or doing the fine work upon the plate that professional etchers had, and he should like to see a law passed that no hand work should be allowed on a plate under any circumstances. With regard to the reproduction of works of art, where fidelity was most important, certainly retouching ought to be the least possible. In producing an original picture he did not see why any method should not be adopted which would enable th finest result to be obtained. With regard to the use of a screen, h threw out a suggestion which he meant to be as vague as possible; bu he had had the opportunity of inspecting plates which had been produced with the aid of a ruled screen, but he did not know exactly the circumstances, or whether the screen was used in combination with a grain on the plate as well he was not able to say. It certainly was not very obtrusive.

HORACE WILMER.

PHOTO-CHEMICAL NOTES.

Action of "Formalin" on Gelatine. — The hardening action of "Formalin" on gelatine has already been recommended as a means of quantitatively estimating gelatine in food products, a method suggested by Ernest Beckmann, who, in the *Report of the 13th Assembly of Bavarian Chemists for* 1894, gives one or two particulars which are valuable when "Formalin" is to be employed as a tanning agent for gelatine plates. The hardening action is the result, according to Ernest Beckmann, of the formation of a compound of gelatine with formic aldehyde, to which he gives the name of "Formalin gelatin." The proportion of formic aldehyde, however, entering into this compound is very small, since he finds that two drops of a forty per cent. solution of the aldehyde is sufficient to render insoluble one gramme of gelatine dissolved in water. It is noteworthy that the action of "Formalin" on gelatine is most effective in a slightly alkaline solution, the presence of free acid reduces the tanning action of the substance.

Detection of Chlorine in presence of Iodine.—A simple and ingenious method of separating iodine from chlorine is that of P. N. Raikow (*Chemiker Zeitung*, 1894, xviii., 1661). It is found that a solution containing a mixture of copper sulphate and phenyl hydrazine, acidified with sulphuric acid, gives, on the addition of a soluble iodide, a reddish grey precipitate, but gives no precipitate on the addition of a soluble chloride. This reaction thus forms the basis for the separation of the two haloids, but it must be observed that the method is of no value in the presence of bromine, inasmuch as the precipitate formed by a soluble bromide is itself considerably soluble in water, so that, were bromine present in the mixture, it would be found in the iodine precipitate, and also in the filtrate containing the chloride, and would thus entirely vitiate the results. The process of separation is conducted as follows. A freshly prepared solution of phenyl hydrazine sulphate is acidulated with sulphuric acid, and treated with excess of copper sulphate solution

To this clear liquid the solution of the chloride and iodide to be separated is added, and the mixture shaken. A precipitate collects on the surface of the liquid, which should appear clear and of a blue colour. The precipitate is filtered off and washed with cold water. It contains the whole of the iodine, which is finally obtained from it by boiling with caustic potash, filtered from the copper, the filtrate acidulated with sulphuric acid, and the iodine precipitated as silver iodide. The filtrate from the phenyl-hydrazine precipitate is further acidified with sulphuric acid and precipitated as chloride of silver.

Ammonium Citrate Solution.—Solution of ammonium citrate is occasionally required for the preparation of sensitising solutions in iron printing. A very ready method of obtaining such a solution in an exactly neutral condition is described by Rudolf de Roude in the *Journal of the American Chemical Society* for January, 1895. If citric acid be treated with a ten per cent. solution of ammonia till dissolved, the mixture becomes quite hot, and, if allowed to stand all night in an open dish, it will be found quite neutral, and may be diluted to the required amount. When such solutions have to be kept for a considerable time, the addition of a small quantity of salicylic acid is to be recommended as a preventive against the growth of fungus.

To Improvise a Funnel.—A very useful way to make use of spoilt celluloid films is to convert them into funnels. The gelatine having been removed, the sheet is folded as is customary in folding a filter paper. The cone of the funnel is perforated with a needle, and the upper edge is secured with a piece of wire. On placing a filter paper in such a funnel, filtration of the liquid poured through it takes place very rapidly, its speed being determined by the number of perforations in the celluloid. This little device was published by Mr. Arthur M. Edwards in the *Chemical News* for January 25, 1895.

G. E. Brown, A.I.C.

BRIXTON AND CLAPHAM CAMERA CLUB EXHIBITION.

The fifth annual Exhibition of the Brixton and Clapham Camera Club was held last week at Brixton Hall. For the first time, we believe, two classes were thrown open to outside competition, and resulted in attracting some high class work of the non-pot-hunting kind, inasmuch as the condition "not previously medalled" was laid down. This is an always welcome innovation, tending to check the unholy greed of those sordid-minded medal collectors who, having by good luck or accident produced photographs which arrest attention or strike the eye, send them on a long journey of rapacity and conquest up and down the country, and are not satisfied until the board has been swept of every available disc of gold, silver, or bronze.

The Judges on this occasion were Mr. Cembrano, Colonel Gale, and Mr. Pringle, and in Class C (pictures in open competition not previously medalled), they awarded the silver medal to Mr. Charles Job for a well-executed winter scene, *A Snow-covered Track*, beautifully exposed and printed. *September*, a group of rustics round an autumn burning of field refuse, a clever and forcible study in Mr. Lionel Bennett's non-dreamy style, secured him a bronze medal, a similar award going to Mr. W. Thomas for a charming river scene, *Sunset in the Pool.* The class comprised notable examples of work by Mr. J. W. Marchant (*A Coming Storm:* a bold sea study); E. C. Hertslet (*East Sussex Pastoral*, a capital uranium-toned platinotype); F. W. Wates, S. B. Donkin, A. J. Jeffrey, W, S. Aston, Percy Lankester (portrait heads) and *Sunshine* and *Shadow:* two young ladies skilfully posed, exchanging confidences, which cause the face of one to assume an expression of mild concern, while the other's is suffused with anger); J. A. Hodges (*In Winter's Grip:* one of this clever worker's characteristically tender pieces); E. R. Bull (interiors of great excellence).

Class A was for work of members of the Club, and contained some splendid examples of the skill of W. Thomas, E. Dockree, F. Goldby, and Levett, which it would be difficult to excel in any Company. For the best collective exhibit, Mr. Dockree won the silver medal. His series of twenty, included landscape and architectural views, as well as water effects—all of high merit artistically as well as technically. For No. 153, *A Stormy Sunset*, a river view embracing the now inevitable Tower Bridge, he also gained the first bronze medal—this was a highly effective little picture. For an exquisite set of twenty-two contributions, Mr. W. Thomas was awarded the bronze medal, this able worker again showing examples of work on the river, in which he is ever successful, for one of which, *Estuary of the Thames*, a happy effect of water and craft, he secured the second bronze medal. It is a pleasure to contemplate such beautifully expressed work as Mr. Dockree's and Mr. Thomas's. In this class a word of congratulation is due to Miss Rutter for three copies of pictures on bromide paper with a Bartolozzi red effect; to Mr. Goldby for some reproductions of plaster casts having uncommonly fine roundness and softness; and to Mr. Levett and Mr. Fenn Kidson for excellent landscape and river views. Some poor work was contributed by the "tail" of the members' class, blank skies and badly posed figures being obvious, but the new comers may be encouraged to persevere with the shining examples of their older fellow-members before them.

Medals in the Open Lantern-slide Class went to Mr. Hankins, Mr. Gear, and Mr. Dockree; and in the Members' Class to Mr. Dockree and Mr. Whittard.

On the whole, an exceedingly good and interesting display, upon which we congratulate the Brixton and Clapham Camera Club, one of our most useful Societies.

CAMERA CLUB CONFERENCE.

The Seventh Annual Conference of the Camera Club was opened at the Club House, Charing Cross-road, on Tuesday afternoon last, by the President (Captain W. de W. Abney), who, in allusion to the change of venue from the Society of Arts, remarked upon the more sociable nature of the surroundings, and said that no doubt, being allowed to smoke, they might listen with greater interest to the papers. Referring to the exhibition of members' work on the walls, he remarked upon its fine quality, and specially complimented the Rev. F. C. Lambert on some small photogravures which that gentleman shows. After announcing that Mr. Leon Warnerke was unable, on account of influenza, to give his promised paper in reference to the use and action of the ruled screen in half-tone work, the President (who had not recovered from influenza) vacated the chair in favour of Mr. Francis Cobb.

The exhibition of members' work includes about 170 examples, and is not only exceedingly good, but also notable by reason of the absence of any curiosity in the way of eccentrically focussed photographs, for the production of which many members of the Club are distinguished. It will suffice to signal out for mention on this occasion some beautiful contributions by Colonel Gale (who is at his best in the treatment of several of those pastoral subjects in which he delights), J. M. C. Grove, Sir Francis Powell, Mr. Brownrigg, Mr. Lintott, Rev. F. C. Lambert, Henry Stevens, H. E. Davis, and Mr. Davison. What, however, pleased us most in connexion with the display was the presence of many portraits of great excellence.

Photography and Decoration.

Mr. Rowland Briant read a paper on this subject, which was in the main a plea for the employment of photography for decorative purposes. He spoke highly in favour of the naturalism of Japanese drawings, and said the Japs made the finest decorators. He advocated breadth of treatment for decorative purposes, and had a good word to say for composition in its broadest sense. Discussing the point as to how far photography could be adapted to the requirements of decoration, he said he thought it would answer for the production of good patterns, and was of opinion that photographic patterns could be readily multiplied by kaleidoscopic means. Incidentally he defended vignetting of pictures. He had no faith in photography as an aid to the decorator, and after severely criticising the "artists" who made use of photography, he came to the real substance of his paper, which was at the end, and indicated the directions in which photography might be made use of for decorative purposes. Among these he enumerated the reproductions of paintings and sculpture, original photographs used as panels and friezes, judiciously made enlargements for wall-paper friezes, decorative wood panels, textile fabrics (with diazotype pictures), photographs on silk and fine linen, transparencies for window decoration, ceramics, photo-sculptures, engraving on copper, patterns on book covers, wood carvings—the relief being first obtained by photographic agency, posters, and book decoration. In illustration of these suggestions, Mr. Briant handed round many examples.

The Chairman having invited discussion,

Mr. Gleeson White complained that a definition of what "decoration" was had not been given. Photography, he thought, was absolutely antagonistic to the work of the designer, and he pointed out that a picture on a coal scuttle would be very much out of place. The repetition of natural forms, again, he considered would be offensive, as, for example, on a frieze consisting solely of Venus de Milos. Referring to the revolution in the production of book covers due to photography, he said that formerly a block would cost, say, 8*l.*, whereas now it might be had for about 15*s.*

Mr. Snowden Ward showed a piece of photo-ceramic work by Rockwood, of New York, and said that such kind of work was much employed for decorative purposes in America.

Mr. P. H. Newman, in the course of some remarks, said that the lecturer had shown that it was necessary to have an artist behind the camera in decorative work. The success of photography, indeed, depended upon photographers being artistic.

Rev. F. C. Lambert said a distinction should be drawn between "decoration" and "design." Mr. Bryant's paper had suggested that there was an enormous field of application open. He joined issue with Mr. Newman as to the influence of photography on art having been a "fearful" one, and pointed to the fact that by the influence of photography trees were now drawn more naturally than they used to be.

Mr. Briant replied to these and other criticisms, and was awarded a vote of thanks.

Mr. Snowden Ward then, by means of the lantern, showed a number of lantern slides made to illustrate the point that in half-tone work the shape of the dot was influenced by the shape of the diaphragm employed

Exposure and Development.

At the evening meeting on Tuesday, Professor H. E. Armstrong read a paper on *Considerations suggestive of Experiments attending Exposure and Development*. Referring to the recent admissions of Messrs. Hurter & Driffield and Mr. Cadett that density ratios as well as speed may be greatly altered by changes in the developer, he asked what was left of Messrs. Hurter & Driffield's original contentions? He regretted that Mr. Cadett had not given data of his recent experiences, and said it was difficult to understand that gentleman's statement that he had met with plates on which a powerful developer produced scarcely any more fog than a weak one. Alluding to Mr. Watkins's contentions as to the part which fog plays, Professor Armstrong said it seemed to him that fog did not so much alter gradations in consequence of a greater deposit being formed in the lower gradations than in the upper, but because it exercised a relatively greater screening effect over the lower gradations. As regards the strength of developers, it was time that more attention was paid to the amount and proportions of alkali used, and less to the reducing agent. It was not improbable that the differences observed were largely due to the different amounts of alkali taken rather than to anything else.

Mr. J. Cadett, in the course of some remarks, said that the question of how the emulsion was treated before a plate was coated had an influence on the result as given by various developers. With the new system of double marking of speed numbers, he found that one must keep closely to a formula in order that the ratios may remain approximately constant. For example, the presence of soluble bromide in a film had a far greater effect with one developer than with another. Remarking that he had found the ratios alterable by development since the very first week of the publication of Messrs. Hurter & Driffield's paper, he defended Messrs. Hurter & Driffield's theory of speed determination, and thought that their discovery was the most important one of the last thirty years. Concluding by remarking on the influence the quantity of gelatine exercised over the sensitiveness of the film, he said the results were most contradictory; sometimes it increased speed, sometimes it decreased it.

After remarks by Mr. Sterry,

Mr. Bevan suggested Professor Armstrong should duplicate Messrs. Hurter & Driffield's original experiments by using one kind of plate and developer.

Mr. Harold Baker quoted some experiments he had made with Mr. Watkins in time development, practically confirmatory of the latter gentleman's theory that the time of appearance of the half-tones bore a definite ratio to the time necessary for complete development, and incidentally mentioned that he systematically used the eikronometer for timing development.

Mr. G. Davison read a few extracts from the earlier publications of Messrs. Hurter & Driffield which he suggested were responsible for the opposition which they had met. He was glad the value of fog was now beginning to be recognised; in former times he had spoken of its advantages in improving pictorial effect.

Professor Armstrong, in the course of a brief reply, said that, while many of Messrs. Hurter & Driffield's earlier statements were misleading, they had made the question of plate-speed measurement popular, and ultimately the gain would be great. Alluding to Mr. Cadett's remarks as to the differences observed in development on account of the difference in composition of the plates, Professor Armstrong insisted on the importance of our knowing the exact composition of the plates, and hoped Mr. Cadett would give the necessary explanations.

Criticism.

The Rev. F. C. Lambert followed with a paper on this subject.

After exhaustively treating of the functions of art critics, who, according to Mr. Lambert, should possess every gift and attribute they at present lack, the lecturer came to the marrow of his remarks, which may be briefly described as a denunciation of the shortcomings of photographic critics. He pleaded for a fuller and more thorough form of criticism, and thought criticisms should be signed.

Mr. Rowland Briant believed that it would be better for the public if no criticisms were written.

Mr. G. H. James's idea of photographic criticisms was that they were generally disappointing.

Mr. Davison said that signed criticisms, if honest, would carry greater weight than unsigned criticisms. The personal view would always remain the most valuable.

Remarks were also made by Mr. Macintosh and Mr. Callard.

Mr. Lambert summed up by saying that his object in starting the discussion that night, was to put an end to the bosh that was written as photographic criticism. When editors and proprietors appreciated the fact that a better thing in criticism was called for, no doubt (Mr. Lambert appeared to think), having regard to the attractions of the nimble pennies of their readers, the phenomenally gifted critical genius he outlined and asked for would be duly provided. No photographic critics (apparently) being present, the meeting closed without bloodshed.

Our Editorial Table.

Thomas's Anti-halation Plates.

R. W. Thomas & Co., Thornton Heath, S. W.

With the object of enabling the photographer to produce negatives in which the defect of halation, inseparable from most classes of subjects, particularly interiors, shall not be apparent, Messrs. Thomas & Co. are issuing a new antihalation plate. It is made in two degrees of rapidity—"Ultra Rapid" and "Medium"—for instantaneous and interior and other work, respectively. The method chosen of imparting antihalative properties to the plate is by giving it a substratum of a "non-actinic gelatinous medium, which is absolutely prevented from combining with the emulsion with which the plate is coated." In use, these plates present no variation in treatment over other plates, development, fixing, and drying being conducted as usual. We have subjected the antihalation plates of both rapidities to practical trial on subjects where halation under ordinary circumstance may be expected to manifest itself, and are happy to say that the new Thomas plate passed the ordeal with complete success. We have no hesitation in predicting that these plates will be highly popular with all classes of photographers, their simplicity of manipulation being a decidedly strong point in their favour. Any of the ordinary developers may be employed, although the makers recommend hydroquinone. We ourselves used both pyro and metol, both of which leave a slight yellow stain in the film which, however, is eliminated by the ordinary clearing bath of acidified alum.

OBITUARY.

George Smith.—We are sorry to have to record the death of Mr. George Smith, an event which occurred on the 19th ult. Mr. Smith was intimately connected with the introducing of the Woodburytype, a process he was generally credited with knowing more of its capabilities and possibilities than any other man. He was in years gone by connected with Braun of Dornach, with Goupil of Paris, and with other photographic houses on the Continent, to whom he taught Woodburytype. In later years he settled in London, and aided by his wife who, like himself, was an expert in Woodburytype and its cognates, established in the North of London as the Sciopticon Company, the business from which was and still is being turned out vast quantities of Woodbury lantern slides in addition to the pictorial and mechanical adjuncts of a general trade. During Mr. Smith's long illness, the seeds of which are believed to have been sown when he was in Paris during the siege of that city during the Franco-Prussian War, the business has been carried on uninterruptedly by Mrs. Smith, who has lately had occasion to enlarge her new premises, at 10, Highbury-quadrant, N., of which their eldest son, having completed his education, will soon become the ostensible head. Mr. Smith himself was educated in University College, and even when a boy displayed an extraordinary aptitude for science, especially in its chemical and mechanical aspects. He was a frequent and welcome contributor to The British Journal of Photography and its Almanac, his articles being invariably of a highly practical nature.

William Ackland.—It is only the other day since we were conversing with Mr. William Ackland, who then appeared in good health, and it is still later since Mr. Ackland was the recipient of the highest gift which it was in the power of the Council of the Royal Photographic Society to bestow, he being elected an Honorary Fellow of the Society. This is a distinction to which, from his long connexion with photography and with the Society, Mr. Ackland was well entitled. He connected himself with the firm of Horne & Thornthwaite nearly forty years ago, when their premises were in Newgate-street, he being the director of their optical works, and he continued, mainly in this capacity, and in particular as consulting occulist in the Strand establishment of the firm up till his removal by death, which took place on Saturday last, the 30th ult. Mr. Ackland was much respected by all with whom he came in contact, and his absence will be felt at the photographic societies and clubs of which he was a member. He was a clever mathematician and a good photographer, and, in the course of his life, wrote several

pamphlets facilitating the practice of the dry processes of pre-gelatine days. His latter-day hobby seemed to lie in the direction of improving equatorial stands and reflecting telescopes, of which several, displayed in Horne & Thornthwaite's window and shop in the Strand, attest his success in this direction. Age, seventy-four.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 6150.—"Improvements in or relating to Focussing Cloths for Photographic Uses." F. BERESFORD.—*Dated March*, 1895.

No. 6214.—"Apparatus for Ruling Fine Lines for Use in Colour Photography." J. JOLY.—*Dated March*, 1895.

No. 6291.—"Improvements in Photographic Shutters for Hand and other Cameras, and to be used in connexion with Photographic Lenses." E. H. JAQUES.—*Dated March*, 1895.

No. 6324.—"Improvements in Photographic Mounts." E. T. COTTINGHAM.—*Dated March*, 1895.

No. 6342.—"Improvements in Photographic Cameras." L. J. R. HOLST.—*Dated March*, 1895.

No. 6362.—"Improvements in Photographic Dark Slides." W. TYLAR.—*Dated March*, 1895.

No. 6555.—"Improvements in or relating to Photographic Blind Shutters.' L. J. R. HOLST.—*Dated March*, 1895.

No. 6562.—"An Improved Mechanical Kinescope for Exhibiting Photographic Pictures in Motion in Combination with Phonograph Mechanism." G. BARRON and THE INTERCHANGEABLE AUTOMATIC MACHINE SYNDICATE, LD.—*Dated March*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name Society.	Subject.
8	A. A. Camera Club	Exhibition of Members' Photographs and Lantern Slides.
8	Camera Club	Annual Lantern Exhibition.
8	Lantern Society	
8	Norfolk and Norwich	
8	North Middlesex	
8	Putney	
8	Richmond	*Printing on Platinum Paper.* Mr. Cembrano.
9	Birmingham Photo. Society	*Photographic and Photo-mechanical Printing.* Walter Griffiths.
9	Bournemouth	*By Road, Rail, and River.* T. Lee Lloyd.
9	Hackney	Open Night.
9	Manchester Amateur	
9	Munster	Opening of Exhibition.
9	Newcastle-on-Tyne & N. Counties	Lecture on Bromide Printing, with Demonstration and Exhibition of Prints on various Bromide Papers. W. Thompson.
9	Paisley	
9	Rochester	
9	Royal Photographic Society	*Notes on the Hurter & Driffield System of Speed Testing.* Mrs. Acworth, A.R.S., Sc., and Dr. Acworth, F.I.C.
9	Stockton	
10	Croydon Camera Club	*The Catechu Toning of Platinotypes.* J. Packham, F.R.H.S.
10	Ipswich and Suffolk	
10	Leytonstone	
10	Photographic Club	Members' Open Night.
10	Southport	Toning Bromide Paper.
10	Stockport	
11	Birkenhead Photo. Asso.	
11	Cheltenham	
11	Ealing	*"Faking" Negatives.* A. Ernest Smith.
11	Glossop Dale	
11	Hull	
11	Leicester and Leicestershire	
11	Leigh	*Toning Bromide Paper.* T. G. Hirst.
11–16	Liverpool Amateur	Excursion: Lake District, with Ambleside for a Centre. Leader, Mr. Anyon.
11	London and Provincial	Lantern Entertainment, Members' Slides.
11	Manchester Photo. Society	
11	Midland	Prize Slides.
11	Oldham	
11	West London	*The Camera—Its Use and where it Fails.* Hamilton Jackson.
12	Croydon Camera Club	First Excursion of the Season.
12	Ireland	*Printing and Toning: Papers, Processes, Mounting.* A. Werner and A. M. Geddis.
13	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MARCH 28,—Mr. J. Weir Brown in the chair.

Mr. FRESHWATER (for the Hon. Secretary) said that he was sure that the meeting would be sorry to hear of the death of Mrs. Bridge, wife of Mr. F. A. Bridge, some time Hon. Secretary of this Association.

On the motion of Mr. E. W. Parfitt, seconded by Mr. A. Haddon, the meeting resolved unanimously:—"That the Hon. Secretary be instructed to write a letter of condolence to Mr. Bridge."

Mr. E. H. BAYSTON read his paper upon *Photography and Cycling.* His bicycle was in the room carrying the photographic apparatus as when travelling, the arrangement of which he explained in detail to the meeting.

Subsequently Mr. Bayston made two flashlight exposures, one of which was developed in the room, the other being taken away for development.

After a hearty vote of thanks to Mr. Bayston for the considerable trouble which he had taken, the meeting closed.

PHOTOGRAPHIC CLUB.

MARCH 27,—Mr. A Cowan in the chair.

Mr. David Hills was unanimously elected a member.

The HON. SECRETARY announced the death of Mrs. Bridge.

Mr. TOTTEM proposed a vote of condolence with Mr. Bridge, which Mr PARFITT seconded, and it was carried unanimously.

It having been suggested that it would be advisable to have two or more purely social gatherings during July and August, not necessarily at the Club headquarters, a requisition, duly signed, calling a special general meeting to consider the subject was handed in.

Mr. SINCLAIR then proceeded with his paper, giving an account of a photographic trip amongst the Italian lakes, showing 110 slides. It was a most interesting and racy lecture.

Croydon Camera Club.—The twenty-first public lantern display was held on Wednesday, the 27th ult., at the Braithwaite Hall, Wellesley-road, when the considerable audience which assembled testified to the sustained popularity of the Club's entertainments. The slides shown were entirely the work of the members, and numbered just on three hundred. The first series shown were by the President, Mr. Hector Maclean, F.G.S., and illustrated in and about Herne Bay. These formed the subject of numerous anecdotes and remarks. A sufficiently remarkable landslip, taken within twenty-four hours of the occurrence, was illustrated by eight slides. These served for some physiographical chat, in the course of which Mr. Maclean stated that, in the adjacent Island of Sheppy, a *pro ratâ* abatement is year by year allowed to farmers from their rent on account of the land washed away by the sea. Mr. Maclean's lecturette formed an object-lesson which other members should take to heart. Pictures lose more than half their charm when shown without order, and when lacking that explanation which can only come from personal knowledge of the scenes to be described. Mr. J. T. Sandell's set of Swiss and Italian views were certainly the finest examples of sustained technique which have ever been shown by the Club. The series of Roman interiors were remarkable for a complete absence of halation of the window traceries, many of which were of exceeding minuteness of outline. Other members showing connected sets of ten or more were Mr. E. R. Berry, whose West Indian glimpses were well appreciated; Mr. G. W. Jenkins, who depicted Cambridge from negatives taken last year at a Club excursion; and, finally, Mr. John Noaks illustrated, in conjunction with Mr. J. Smith, "Bonnie Scotland." A large number of "mixed slides" were also exhibited by Messrs. H. E. Holland (a fine Hastings set), A. J. Noaks (a varied and thoroughly well-executed collection), G. Corden (brilliant snap-shots of skating, &c.), W. Wreford, and W. F. Frost. A number of hand-coloured slides were shown by Mr. A. E. Isaac, and met with much approval. This gentleman also handled the lantern, &c., with complete satisfaction. Four attractive musical items were given in the interval under the able direction of Miss Cumbers.

Gospel Oak Photographic Society.—At the General Meeting of this Society, held on March 19, the following officers were re-elected:—*President:* Rev. H. Le Pla.—*Vice-President and Treasurer:* Mr. W. H. Rollason.—*Committee:* Messrs. W. Beyer, F. M. Davies, J. Gittens, F. H. Hall, and J. Hingston.—*Hon. Secretary:* Mr. W. A. Palmer, 13, Dale-road, Kentish Town.

Woodford Photographic Society.—March 28, Mr. E. B. Caird in the chair.—A few prints were handed round by the President, also some of flower studies by Mr. Emler. A circular was read respecting affiliation of photographic societies, and a short discussion on gas and gas cylinders took place. Mr. WILMER then gave a brief account of his travels in Denmark. A map was shown giving the routes taken on the two trips, one with a canoe and another with a two-tonner. In a very lucid and interesting manner he described each slide as it was thrown on the screen. A very enjoyable half hour was thus spent, and was much appreciated by the members present.

Bradford Photographic Society.—At a meeting of this Society, on March 28, Mr. W. CUDWORTH gave an interesting limelight lecture on Old Bradford, illustrated by many views of old and rare pictures. Mr. Cudworth being an old inhabitant was able to give thrilling and descriptive accounts of the many places now vanished from sight, and by the aid of word-painting carried his hearers back to the good old days. There was a large and appreciative audience. The thanks of the meeting were accorded to Mr. Cudworth for his interesting lecture, and to Mr. R. J. Appleton for the loan of his magnificent triple lantern. The President (Mr. Alex. Keighley) occupied the chair.

Liverpool Amateur Photographic Association.—March 28, the President (Mr. Geo. B. Newton) in the chair.—Seven new members were balloted for and duly elected. A lantern lecture was given by Mr. WM. HARVEY, entitled *A Tour in the Highlands.* The lecturer gave an interesting account of his visit last summer to Scotland, and showed a large and excellent series of slides from negatives taken during the visit. He, in a racy and humorous manner,

described the personal incidents of the tour, and related some very amusing Scotch anecdotes. Altogether, the lecture was an excellent one, and was much appreciated by a large gathering of members. Before the meeting separated, a very ingenious panoramic camera of French invention was shown by Mr. W. J. Archer, who explained the manner in which it is worked.

Plymouth Photographic Society.—Mr. F. O. Bynoe, of Messrs. Beck, London, demonstrated, on March 29, before the members of this Society, the advantages of the Frena hand camera. The lecture was made very interesting throughout, and the specimens of work done by the Frena lost nothing of their excellency in projection on the screen. At the next meeting of the Society, *Development for Beginners* is to be demonstrated by Mr. E. H. Micklewood, one of the Vice-Presidents.

FORTHCOMING EXHIBITIONS.

1895.	
April 15, 16.....	*Beverley. T. J. Morley and A. W. Pickering, Toll Gavel, Beverley.
,, 30–May 4	*Eastbourne. J. J. Hollway, 11, Hyde-gardens, Eastbourne.
May 6–11.....	*Birmingham. C. J. Fowler, 2, High-street, Birmingham.
June 29–July 6	*Agricultural Hall. W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

News and Notes.

Easter Holidays.—Messrs. Wratten & Wainwright, of 38, Great Queen-street, London, W.C., ask us to state that their business premises will be closed from Thursday night, April 11, to Tuesday morning, April 16.

Royal Photographic Society.—April 9, Ordinary Meeting.—*Notes on the Hurter & Driffield System of Speed Testing*, by Mrs. Acworth, A.R.S., Sc., and Dr. Acworth, F.I.C., at eight p.m. Exhibition of lenses will remain open until after the 9th inst.

The Meisenbach Company write: "We have the pleasure to hand herewith particulars of a prize competition for the most artistic display of an advertisement. The advertisement may be composed of letterpress, either with or without ornaments, rules, and borders, the idea being to leave what constitutes the most artistic composition to the taste of the competitor. The prizes—20*l.*—are offered as some slight acknowledgment to printers generally for the notable advance recently made in the art of printing illustrations engraved by the Meisenbach process, and with a view of encouraging artistic display in letterpress, &c. In these days of keen competition, any scheme which will tend to raise the standard of excellence in art and manufacture can hardly be made too widely known." Full particulars may be had of the Company, West Norwood, S.E.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

MARKINGS ON NEGATIVES CAUSED BY THE NEW METHYLATED SPIRIT.

To the Editor.

Sir,—A short time ago there appeared in the Journal a letter complaining of spots, or markings, on negatives which had been dried by means of the new methylated spirit. As the result of repeated trials, I find that this spirit may be used for that purpose with perfect safety if the negative is wiped dry as soon as the spirit is poured off. I generally use an old silk handkerchief for the purpose.

If the negative is left to dry spontaneously, it is likely that the small quantity of mineral oil will run together, and cause the marks complained of.—I am, yours, &c. T. Stokoe.

Clare, Suffolk, March 29, 1895.

UNEVEN TONING.

To the Editor.

Sir,—I enclose you a set of prints made from same lot of paper sensitised the same way, and toned in same bath; what is the reason of their being so different?—I am, yours, &c., Puzzled.

[See leading article.—Ed.]

DECADENTS AND THE SALON.

To the Editor.

Sir,—The reference to the "new school of photographic dreamers," by Mr. Holman, brings us to the pith of the whole matter. So long as some photographers have no higher "ideal" in photography than the making of negatives by simple chemical operations, and deny that portraitists or landscapists *can* have a higher ideal, so long will there be two schools of thought.

To make the best possible picture of any given subject requires judgment, careful selection of good points, posing, lighting, and, the most difficult part of all, an earnest effort to put "soul" into the said picture, which, when accomplished, results in it being the creation and conception of the mind at work upon it—hence art.

My apology (if apology is needed) in entering this controversy is the simple fact that, being an earnest "learner" of the "master hands," I am anxious the real points at issue should occupy the first place and personalities take a back seat.

If it is a lack of manliness to take no notice of anonymous attacks, it is also, I think, a far greater want of the same spirit that allows any one to indulge in throwing stones, under assumed names (those who understand human nature put it down to spite).

Lastly, I am supported in my views by a "classical" writer of your Journal, who refers, on page 102 of The British Journal of Photography for Feb. 16, 1894, to the very same subject that caused me to write my first letter. Will those interested kindly look it up?—I am, yours, &c

P. E. Coe.

AMATEURS AND PROFESSIONALS.

To the Editor.

Sir—Your issue of this week contains a communication from "G. and R. Lavis." With respect to the circular which was appended, may I say that the proposition therein contained was withdrawn immediately it was found that an error of judgement had been committed? Committees, like the individuals of which they are composed, are sometimes liable to allow their energy to outrun their discretion, and this was a case in point. Will you, therefore, permit me to say that there is not the slightest intention of carrying out the idea?

There is, however, a personal question involved. I may say that the writer, who has chosen to veil his personality under the professional style and title of "G. and R. Lavis" is (nominally at least) one of our members, and his sense of what is due to his own Society may be fairly gauged by his action in this matter, which either denotes a childish love of mischief-making or else a genuine desire to damage the prospects of our Exhibition.

Our Society contains professional as well as amateur members, and the gratuitous sneer at "gentlemen" amateurs may be met by the remark that we have professional members who are equally entitled to that honourable appellation. That your correspondent has, however, thought fit to go out of his way to use this particular method of disapproval is only another proof that there is no rule without an exception.

His communication is a not very creditable attempt to effect a breach in the good relations which happily exist between professionals and amateurs in this town.

I am glad to say that there is no chance of his evident desire to lessen our chances of success being realised. The offers of help we are receiving from all quarters are most gratifying, and we hope to hold an Exhibition, which, in the Miniature Crystal Palace, at Devonshire Park, will be an unmistakable success.—I am, yours, &c., J. J. Hollway.

11, *Hyde-gardens, Eastbourne, March* 30, 1895.

To the Editor.

Sir,—As a member of the Committee which authorised the circular (quoted by G. and R. Lavis in last week's number), I beg to state that it was quite a breach of honour and a display of exceedingly bad taste on the part of your correspondent to send for publication a circular which was strictly private to members of the photographic profession in Eastbourne, and, although its issue has proved a mistake on the score of professional etiquette, there was absolutely no justification for its publication to the world in the British Journal of Photography.

Great lack of thought, if nothing worse, is shown on the part of the writer of last week's letter, who, being a member of our photographic society at the time of sending his communication, ought to have been one of the very last to do anything to excite prejudice against the governing body, especially as in view of the approaching exhibition, great harm to its prospects might have resulted if any ill-feeling had been excited in the photographic profession. I may say that the circular has been withdrawn, and that the responsibility of its issue in the first place rested entirely with the Committee and not on our hard-worked and energetic Hen. Secretary, who is doing his best to make the Exhibition on the 30th inst. a great success.—I am, yours, &c.,

A Member of the Committee of the Eastbourne

April 2, 1895. Photographic Society.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

DR. MCM.—The pronounced yellow patches and the general yellowness of the lights are due to imperfect fixation.

OTHELLO.—There is no objection to the employment of daylight for illumination in the practice of photo-micrography.

A. D. KEIGWIN.—Sulphantimoniate of sodium may be obtained from any photographic dealer. Its ordinary name is Schlippe's salt.

W. N.—We purpose having a further investigation of the sp. gr. of ammonia made. Meantime thanks for the rule, which will be tried and reported on.

W. BERRY.—By using thin tissue paper or tracing cloth the admission of direct sunbeams into the studio will be prevented. Tracing cloth may be had from artists' colourmen.

J. L. CLARK.—The powder colours spoken of in our issue of December 21 are procurable from Fallowfield, Charing Cross-road, London. We do not know of any place in France where they can be procured.

F. ARGALE.—We scarcely understand what you mean by "ready prepared," but Messrs. Marion & Co., like all other large dealers, supply bevelled-edge glasses for what are known as opalines.

PONTIUS PILATE.—We believe the twin lens (N. & G.) camera mentioned to be a really first-class instrument. You need not entertain any doubt as to the excellence of the lenses supplied with it if made by the makers named.

WEMBLEY AMATEUR.—The obtaining of a "round" portrait does not depend upon the lens used but upon the lighting. You might try the effect of adding the simple lens suggested, but we do not think any improvement will result.

G. VON DOOZY.—Although a lens of the kind described is not now of great commercial value, yet it may answer your requirement quite as well as one of modern make. We could not pronounce definitely as to its merit without seeing it.

A. L. N.—Opinions vary as to the comparative advantages of the lenses mentioned. Those of the rapid rectilinear form will perhaps be the best for portraiture; but we cannot speak from a practical comparison, not having tried the newer form of objective.

C. WILLS.—Using carbon printing only occasionally as an amateur, we should say that you run no risk whatever of incurring trouble from the injurious action of the bichromate on the skin. However, it will be advisable to well wash the hands after the work is finished.

S. W.—Ether and alcohol are cheaper in Germany than they are here. But that is because the duty on spirit is different there from here. If ether and alcohol are imported into this country, the duty on them will have to be paid, which will enhance their price to that of the home production, or more.

COUNTRY PHOTOGRAPHER.—1. Order from the stationer the thinnest kind of tissue paper that he can obtain. 2. It will be better to lessen contrast by subduing the top light than by placing a reflecting surface on the floor of the studio, but the effect of some sheets of white paper being used for such purpose may be tried.

J. H. S. asks: "What varnish would you advise for oil paintings? I have tried mastic, but it all dries in. Should be glad if you could answer."—We can recommend nothing better than mastic varnish, that is what is used by all artists. It should be obtained from a reliable source. Possibly a second coat will remedy what is complained of.

G. G. A. S.—Ground glass for the top of the studio will do very well, but in large towns it is troublesome to keep clean. We should advise the sides to be of plain glass. As the sun is only likely to be of trouble early in the year, and then only early in the day, could it not be stopped out by one or two movable screens, to be applied only as occasion requires?

W. B. S. says: "In your issue of July 20, last year, page 459, in an address given by Mr. A. Taylor, F.R.A.S., at the Dublin Convention, mention is made of a telescope—made by Sir Howard Grubb for Dr. Gill at the Cape—with an electric control from an independent pendulum. Can you tell me where I can see a full description of this arrangement, if such has been published?"—Yes; see this JOURNAL for June 1, 1894.

S. BINGHAM.—There is no novelty in the production of carbon pictures on artificial ivory, or on ivory itself. They were, a couple of decades ago, made on artificial ivory with a gelatine basis, called "eburneum," and in later years on xylonite or celluloid. Hence any patent for it would be of no use. If, however, you have any new material, as the artificial ivory, a patent for carbon pictures on that might be valid, provided it *is* new and has not been used before.

HALYBURTON writes: "Kindly inform me from whom a vitrifiable carbon tissue can be procured, and finely ground colours for the tissue, and if a formula has been published for making the same, also who supplies the porcelain or tile plaques."—The tissue is not an article of commerce, and a formula for its preparation has not been published. Vitrifiable colours may be obtained from Messrs. Emery & Co. and Messrs. Hancock & Co. The address is Hanley or Burslem, Staffordshire, for the moment we forget which. Brownfield & Co., Charterhouse-street, we think, supply plaques and Minton's firm tiles.

A.—So far as we remember for the moment, we know of no case in which a photographer has been proceeded against for a return of the premium paid, and damages, in the case of an "articled pupil," or apprentice, not being properly taught the trade. There have been cases in other trades, and they have been successful, and they would be equally so if brought in many instances with regard to photography. Perhaps proceedings have, in some cases, been instituted, but have been compromised instead of being taken into Court. There have been many grievances in this direction, to judge from the letters we have received on the subject.

PARADE writes: "Having sold my business, is it at all requisite that I should have a solicitor to read over the indenture or the agreement, as the purchaser proposes to have the paper drawn up by a London solicitor? Also, is it safe to send the solicitor my agreement? He has now my mortgage, also the transfer of mortgage. What would be the charge of a solicitor?"—It is usual in the transfer of business for each side to have the services of a solicitor. If that is done in the present case, the vendor's solicitor will watch his interests as regards the mortgage, &c. The solicitor's charges will be according to the work done. We cannot give any opinion about that.

REGISTRATION.—1. If you are paid by the sitter for taking the portraits, you have no right to any copyright in them. 2. The copyright must be registered before any proceedings can be taken. 3. The copyright is vested in the author of the work; that is, the one who produces the picture. If that is the work of an operator, entirely independent of the employer, the copyright is vested in him, as in the case of Nottage *versus* Jackson, where copyright was held to be invalid because it was registered in the employer's name, when the work was executed by an *employé*. If you write to the Secretary of the Photographers' Copyright Union, London Chamber of Commerce, E.C., you can obtain a pamphlet giving you very full information on this matter.

A. writes: "Can you tell me the reason of the habit Eastman's Solio paper has of blistering in the printing press? I take the greatest care to dry it at the fire just before using, and back it with 1, blotting-paper, thoroughly dried; 2, cloth; 3, indiarubber cloth; 4, pure indiarubber. Each of these have I tried, separately and together, and yet fully one-third of the prints are spoilt. I enclose a sample."—You evidently mean not blistering but buckling, or want of contact in printing, which is due to the pads of the printing frame not being in the same hygroscopic condition as the paper. If the former contains moisture and the latter is abnormally dry, buckling is sure to occur. If the paper is stored in a tolerably dry place, it is not necessary to further dry it before printing, and, if the frames and pads are kept in same place as the paper, there will be no difficulty in securing good contact in the printing, provided, of course, the back boards of the frames are even, and the pressure good.

H. C. writes as follows: "I should be extremely obliged if you would answer the following questions: 1. I have an agreement with a house-owner, which contains special clauses enabling me, or giving me permission, to erect a photographic studio, &c. This erection is nearly finished, and has been sanctioned by the parish authorities. The next-door neighbour, however, is a freeholder, and has given my landlord notice to remove the structure, as (he asserts) it contravenes certain covenants in the title-deeds. Supposing this to be so, have I not legal grounds for claiming compensation for all loss and expense from my landlord, who entered into the agreement that gives me permission to erect? It seems to me impossible that a man can be entitled to make certain provisions in an agreement that his deeds show to be illegal without having to pay the penalty. 2. Has the question of photography being a trade or a profession ever been settled? Certain provisions are made to restrain people from carrying on a trade upon certain property, and the question arises, Is my business a trade or a profession? A man may open a school upon such property, because a schoolmaster is supposed to belong to a profession. Have I the same title? I have no shop, and shall work chiefly by private recommendation."—In reply: 1. If the landlord has entered into an agreement which he had no power to do, it seems to us that he has made himself liable for damages; but we should advise that a solicitor be consulted at once. 2. The question has frequently been discussed in bygone times, but we do not know if it has ever been settled in point of law.

CONTENTS.

	Page
LENSES OLD AND NEW	209
IMPORTANT COPYRIGHT DECISIONS	210
UNEVEN TONING	211
UTILISING ACCIDENTALLY EXPOSED PLATES	211
SUGGESTIONS IN CONNEXION WITH GELATINO-CHLORIDE PAPERS. By W. B. BOLTON	213
CYCLING AND PHOTOGRAPHY. By E. H. BAYSTON	214
ART AND PRACTICE OF COLLOTYPE. By WM. A. DENOVAN	215
SOLARISATION: A LECTURE EXPERIMENT. By ARTHUR RICHARDSON	6
MODERN PHOTOGRAVURE METHODS. By HORACE WILMER	216
PHOTO-CHEMICAL NOTES. By G. E. BROWN, A.I.C.	218
BRIXTON AND CLAPHAM CAMERA CLUB EXHIBITION	220
CAMERA CLUB CONFERENCE	220
OUR EDITORIAL TABLE	221
OBITUARY	223
RECENT PATENTS	223
MEETINGS OF SOCIETIES	223
FORTHCOMING EXHIBITIONS	223
NEWS AND NOTES	223
CORRESPONDENCE	224
ANSWERS TO CORRESPONDENTS	224

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CLOUD-CATCHING.

We can very well afford to excuse the indulgence into even wild rhapsodies over a fine display of clouds, either in the ethereal sky or in that of a pictorial representation, although we have no intention of doing so. Our remarks at present will savour of the more prosaic subject of discoursing on methods of capturing clouds by the camera, or of applying them to pictures in which they are not originally present.

On account of the great luminousness of the sky as contrasted with that of the general landscape, an exposure sufficient to bring out all the detail in the latter has, in the great majority of cases, the effect of causing an obliteration of all fine forms of clouds in the sky. In consequence of this, when natural clouds are required to be impressed along with the terrestrial subject, some one or other of several known expedients must be had recourse to in order to effect an equalisation of the exposure requisite for sky and landscape.

A pectinate or serrated flap attached to the hood of the lens has been employed for this purpose by many successful landscape photographers. It consists of a light flap containing a number of small laths, each terminating in a sharp point, like that of a pencil, and capable of each being raised or lowered in the frame, so as to enable the whole to approximate the outline of the landscape with the sky cut off to suit the contour of the trees or mountains, although not in an absolutely sharp line. When an exposure deemed to be sufficient has been given to the landscape, the flap is raised for a brief period and a quick exposure is given to the sky.

In the system first adopted by the inventors of the Pantascopic camera we recognise the most perfect one for obtaining clouds together with a fully exposed landscape. In this camera, it will be remembered, the plate is made to travel by means of suitable clockwork behind a slot in an opaque screen in which the slot is adjustable to such an extent, and is of such form and dimensions as to be very narrow opposite the sky, and to gradually open out as it approaches the foreground of the picture. To enable this to be effectively done, each side of the slot is formed of a wing made of blackened zinc or thin vulcanite curved so as, when adjusted, to admit of a suitable relative proportion of light to the sky and to the foreground respectively. In this system, we repeat, is to be found the means of obtaining clouds and landscape in the most perfect manner capable of attainment.

When this system is applied to the ordinary stationary camera of every-day use, we have a cloud-catcher that cannot be surpassed. To apply it, we have only to adopt its converse as originally applied, that is, to cause the slot shutter to move across the front of the sensitive plate instead of having the plate moving behind the slot. Focal-plane shutters, having a horizontal movement, have been employed for many years, and when driven rapidly across the plate have proved the means of obtaining wonderful results in a good light. It was a shutter of this kind that was employed by Colonel Stuart Wortley in photographing the Falls of Niagra some thirteen or fourteen years ago, the instantaneity being such as to have led to the objection by artists that the picture was devoid of any indication of motion.

To prevent the unsightly projections necessary when the shutter assumes the form of a zinc or other rigid plate being driven across and near to the plate, flexible light-proof bags have been employed to cover the slots in the sides of the camera or dark slide, through which the long exposing shutter —slightly exceeding twice the length of the plate—must move. But for such a bag, light would enter the camera and fog the plate.

Arising out of the above by a natural process of evolution is the curtain or roller-blind focal-plane shutter made to travel horizontally across the plate, and having in it a slot, the edges of which are formed of two opaque wings, curved and capable of adjustment, precisely the same in every respect as the one in the Pantascopic camera, only formed of flexible instead of rigid material. This, when propelled by a spring, forms, both in principle and in practice, the best and most convenient of all cloud-catchers if properly constructed. Two factors determine the rapidity of the exposure capable of being given with a shutter of this nature—the rapidity with which the slot is made to travel across the plate, and the width given to the slot, which, as its slides are curved and adjustable, may be any width the photographer desires, so as to suit the exigencies of lighting.

About eleven years ago we had one of this class constructed for use with a Scovill 8 × 5 camera; but, afraid at first lest the tension of a spring would cause it to travel unequally from end to end, we had it driven by the pulling of a string hanging outside. One advantage of this lay in the ability to slightly vary the speed at which it travelled when any dark object in the scene was being impressed, for a tell-tale band of string passing on a pulley on the top of the camera indicated the position of the narrow slot, and at that time we were using a lens of barely over four and a half inches focus for covering the 8 × 5 inches plate.

But what we thought an objection to this was the necessity for the employment of a camera stand when operating, thus rendering it nearly impossible to use it as a hand camera. A spiral or volute spring, however, does away with every difficulty and objection.

CAUSTIC ALKALIES *VERSUS* CARBONATES.

Our recent reference to the alkaline carbonates, more especially with regard to the carbonates of ammonia, once more brought to the front the question of the comparative values for developing purposes of those salts and the hydrates respectively, and we were led to make a few trials in which the two were pitted against one another under as nearly as possible similar conditions.

With the single exception of ammonia, none of the alkalies in the caustic state have ever received any practical recognition in conjunction with pyrogallol, for reasons which it is scarcely needful to examine into very closely, suffice it that the results have proved in all cases inferior to those obtained with the carbonate. Some years ago, it is true, M. A. Davanne, of Paris, described in the Almanac a preparation to which he gave the name of saccharate of lime, that was intended for development, and which consisted of a solution of freshly slaked lime in common syrup. If hydrated lime be shaken up with water, an appreciable quantity is taken up, as is well known to form lime water; but, if for plain water a strong syrup of cane sugar be substituted, the solubility of the lime is very greatly increased, and a solution of comparative permanency is obtained.

But the use of the saccharate of lime solution as proposed by M. Davanne was rather in conjunction with ammonium carbonate, if we remember rightly, than by itself; it was, in fact, calculated to restore or impart energy to solutions of the carbonate that had changed from the normal to the acid condition, a function that it performed by absorbing the carbonic acid and restoring the solution to the more active condition. As was pointed out in a previous article, the precise composition of such a solution is very doubtful, as it may consist of sesquicarbonate, a mixture of the acid and normal carbonates, or all three together with excess of caustic ammonia. Whatever the result might be, however, employed under these conditions, the saccharate of lime served a useful purpose, but when used alone—*i.e.*, without the carbonate—in conjunction with pyro its results were far from satisfying, partly from the comparative feebleness of its action and partly from the messy nature of the compound solution and the dirty images it gave. Employed in a similar manner in conjunction with the fixed carbonates, it is possible that the saccharate of lime solution might prove useful to a small extent, but its function of converting the alkali to the caustic condition will be more completely exercised, and with less trouble, by employing the hydrate of lime itself. Caustic lime, as a possible developing agent, may therefore be dismissed from further consideration.

Turning to the others, we have ammonia, potash, and soda left to choose from. Of the first, and most generally used, we need only say that, with the exception of carbonate of ammonia perhaps, though it is doubtful which was the earlier in use, it is the oldest form in which an alkali was used in conjunction with pyro, and still remains in the opinion of many competent judges the favourite and the best. Its one weak point is found in its volubility, which gives it a certain character for uncertainty of action when used in the somewhat careless modern fashion, but when used in the more careful manner in vogue a few years back, pyro and ammonia, it is still claimed by many exhibits a wider range of power than any of the newer agents.

Except in conjunction with pyro, however, ammonia does not seem to have secured much favour; but this is, probably, rather owing to the circumstance already alluded to than to any actual inferiority in its behaviour. For example, we have used it in conjunction with metol, producing the very finest results we have obtained with that agent, but do not so employ it regularly on account of the uncertainty of its action as compared with other alkalies. With hydroquinone ammonia was alleged to be distinctly inferior in action, and some experiments made in that direction a few years back seemed to corroborate that view.

Potash and soda, employed in conjunction with pyro, have never led to any conspicuous degree of success, apparently by reason of their too great developing energy, combined with the rapid manner in which they discolour and decompose the pyro solution. The first fault might, no doubt, be remedied by the use of suitable restrainers, or by resorting to an adequate degree of dilution; but the tendency to discolouration, except in the presence of a very large proportion of sodium sulphite, proves a fatal objection to the employment of the fixed caustic alkalies with pyro, especially as the corresponding carbonates behave in an altogether satisfactory manner. These, in fact, may be looked upon as possessing the energy of the caustic alkalis, *plus* the needful restrainer in the form of carbonic acid, which, while it holds in check the surplus developing energy, at the same time obviates the excessive tendency to discolouration.

But it is in conjunction with the newer forms of developer, such as para-amidophenol, metol, and glycin, to say nothing of the older, hydroquinone, that the advantages of the hydrates over the carbonates are most likely to be found. In fact, it may be said that such advantage has already been discovered, and only remains to be more completely utilised. Thus hydroquinone, it is well known, in conjunction with carbonate of soda or of potash, forms an exceedingly slow and tediously acting developer; whereas, if either of the hydrates be substituted, we have a developer of the greatest energy, remarkable alike for its rapidity of action and the vigour of the images it gives. Then, again, turn to rodinal, a particularly energetic developer in concentrated form and well under control, which, no doubt, owes its qualities to the fact that it consists of para-amidophenol in combination with potassium hydrate, for an entirely different behaviour is exhibited when the carbonate is used.

In some recent experiments we have made we have tried the hydrates of sodium and potassium in conjunction with metol and glycin, and also in the mixture of metol and hydroquinone, to which we have referred on several occasions during the past few months. So far as the two hydrates are concerned, there is little if anything to choose between them, their relative effects being practically indistinguishable; but, as compared with the carbonates, they exercise a more energetic developing action, and, when carefully balanced and held in check, give images of greater vigour and density. Solutions of the hydrates will bear, or, rather, absolutely require, a stronger dose of restraining bromide than is customary with the carbonates, indeed it seems almost impossible to arrest the developing action by this means. Even with abnormally large additions of bromide, to

the extent of six or even eight grains to the ounce of developer, the faintest details of an image after brief exposures will be sought out by the caustic alkali if time be allowed; in fact, under such circumstances, a brighter negative with more detail will be obtained than with carbonate employed without restraining bromide. The latter will work clearly without restraining bromide, whereas it must be borne in mind the hydrate will not.

We have not yet completed our experiments, and hope to turn to them again shortly. Meanwhile we may say that the solutions employed have been made in the following manner: Solutions of the respective carbonates of normal strength—that is, the solutions in ordinary use—were boiled for a few minutes with a little slaked lime, and then set aside to cool and clear. It is impossible to filter such solutions unless glass, wool, clean sand, or some such medium, be employed, as ordinary filter paper would be rapidly destroyed and reduced to pulp. If this method be adopted, the comparative values of the alkali in the caustic and the carbonated condition, as well as the relative restraining effects of bromide and of carbonic acid, may be nicely estimated.

The Lantern Season.—When does the Lantern season close? To judge from the reports from the various Societies in different parts of the kingdom, it is still in full swing, cylinder explosion notwithstanding. If one looks back at the reports of some Societies for the past few months, one can only come to the conclusion that they are almost more lantern Societies than they are photographic Societies, inasmuch as photography only figures as an adjunct to the lantern. It would, indeed, be difficult to conceive how many of the Societies could exist were it not for the lantern and its popularity. But if County Councils are to have their "fingers in the pie," as they had recently at Brixton, lantern shows can only be carried on under difficulties and inconveniences.

Amateurs and Professionals.—The letter in our issue of a fortnight back, signed by G. & R. Lavis, calling attention to the circular of the Eastbourne Photographic Society, and its free-portrait trading scheme, has brought forth a letter from the Secretary of that Society, and also one from "a member of the Committee," saying that the scheme had been withdrawn, and admitting that the issue of such a circular was ill advised. These letters however, would have been far more graceful had they not charged the writer of the letter which no doubt brought about its withdrawal with "a childish love of mischief-making," "a desire to damage the prospects of our Exhibition," "bad taste," "breach of honour," and other innuendoes. The circular *was* issued by the Committee, and attention was called to it in the interests of all professional photographers, so why should the one who did so be subjected to the innuendoes referred to?

The Gas-cylinder Explosion and the House of Commons.—Some of the reports given of, and comments made upon, the late unfortunate occurrence in the lay press have been most amusing, as is frequently the case when it touches upon scientific topics. One of the expert witnesses, for example, is made to say, in one of the papers, that the best material for cylinders was mild steel, containing not more than "twenty-five per cent. of carbon." Perhaps, however, one of the most amusing things in connexion with this sad affair was a question put to the Home Secretary, in the House of Commons, one day last week; it was, "if his attention had been called to the explosion of a gas cylinder, charged with chlorate of potash, which recently occurred at Fenchurch-street Station," &c., "and whether steps could be taken to have cylinders that were used for such purposes properly tested and duly stamped, so that their strength might be known by the users?" It is the first time that it has been suggested that the ill-starred cylinder was "charged with chlorate of potash." Evidently the intentions of the worthy member who put the question were better than his knowledge of the most elementary chemistry.

Fine Art at Whitechapel.—The fifteenth annual Exhibition of pictures was opened to the public at the Toynbee Hall one day last week, and will remain open until the 21st inst. There is no charge for admission. It is noteworthy that this show is open on Sundays as well as week days. Canon Barnett and his fellow-workers are to be congratulated on the collection of works they have got together, which is universally pronounced to be one of the best of the series. In the Exhibition are to be found paintings by Munkacsy, Leighton, Millais, Alma Tadema, Watts, Herkomer, Rossetti, and other well-known artists. The picture of *Wine and Song*, by the first named-artist, has seldom, if at all, before been exhibited in this country. The idea of the promoters of these annual Exhibitions is to establish a permanent art gallery at the East-end. The West-end is, or will be, when the new National Gallery is opened, well furnished with pictures, though the East-end has none. That art is appreciated in that district of London is proved by the fact that while the Exhibition was open last year it was visited by between seventy and eighty thousand persons. Although art is so well appreciated, as it unquestionably is, at the East-end, the specimens exhibited in some of the local photographers' show-cases would not lead one to imagine that such was the case.

A "Q.C." and the Camera.—Clearly Sir Frank Lockwood, Q.C., M.P., is no friend of photography. On Saturday last, when opening the annual Exhibition of school drawing of the Royal Drawing Society, he took the opportunity to say that he was not one of those who had a great admiration for the camera, and that he was filled with great apprehension when he looked at the illustrated papers and found them neither more nor less than a bundle of "instantaneously produced photographs." The draughtsman, he admitted, could not get as near truth as the camera. But in the cause of art there was something that the artist could get far removed from the power of the camera. He also said that it was not encouraging for a young fellow, who walked down Fleet-street with a portfolio of sketches full of life and power, to find himself everywhere frustrated by the camera. He added that he was there that afternoon to protest as strongly as he could against the art of the country being driven out from amongst them by the camera. Of course these remarks would be received on such an occasion with applause. But the speaker does not seem to have realised that, but for photography, the majority of the "Fleet-street" publications would have had no existence, and that the old "illustrateds," in utilising photography, now know quite well which class of illustrations those for whom they cater like best, "the truth of the camera," or "what the artist can get far removed from the camera."

The Coupon Fraud.—It is surprising how easily the British public are "gulled" when it is promised some unusual privilege. Take the free-portrait swindle, for example. That has been exposed time after time in the photographic press, and also in the daily press, and criminal proceedings have been taken, and yet the thing flourishes. So with the coupon fraud, which is carried on in the suburbs of London, although it has been exposed in our columns several times. The system is this: Unscrupulous individuals obtain books of so-called "coupons," which may be had from some houses by any one applying for them, entitling people to have portraits taken at exceedingly low prices. They then visit houses in the suburbs and offer these coupons for sale for small sums. When any demur is made to the distance to go for the sitting, the dupe is told that the sitting may be had from some established photographer of repute in the immediate neighbourhood. In this way a shilling or more is obtained, or even sixpence, and, when the victim presents the ticket, he or she discovers the fraud, and the photographer to whom it is presented that his business reputation is suffering from

that and previous similar frauds. One photographer we know has had an advertisement in the local press, N.W. district, for many weeks past, cautioning the public against the fraud, and yet he is continually having these "coupons" presented. The police of the district have been communicated with, but with no effect. The matter was then laid before the Scotland Yard authorities, who sent a representative to obtain details, and yet the fraud succeeds. If professional photographers had an *efficient* trade protection society like most other professions, and the matter had been brought before the police authorities by it instead of by single individuals, a remedy as well as a protection to the public might be forthcoming.

JOTTINGS.

SACRED

TO THE MEMORY OF

"ZOILUS."

A not Socially Obnoxious Young man of merit and good character, who by his Miraculously Wise, Impartial, High Principled, Discreet, and Tasteful Discussion of Men and Manners in the pages of a photograpraphic periodical attracted some notice and attention.

But, alas!

His rivals and enemies, of which, like all great men, he had many, growing jealous of his skill and success, conspired to ANNIHILATE HIM,

and bribed his Editor to administer to him an overdose of printer's ink, from the effects of which he never recovered, and which ultimately caused his deeply lamented death on March 22nd, 1895, aged only 7 months.

Of your charity pray for the repose of his Zoil(us).

Interred near Woking.

The New English Art Club's Exhibition stands in the same relationship to other and older picture Exhibitions as the Exhibition of the Photographic Salon does to that of the Royal Photographic Society. The parallel, indeed, is perfect. The New English artists are a small body of clever and daring insurgents who rebel against conventional methods of artistic expression. They, or rather many of them, delight in extreme breadth of effect; they handle and mass colour with a freedom and dash which is suggestive of nothing so much as a frenzied and feverish anxiety to produce works having no resemblance in style or method to that of mere "vulgarians" like Leighton, Alma Tadema, Orchardson, Leader, Poynter, &c.; they exalt the commonplace in choice of subject; they badly paint the grotesque, the strange, the weird, the ugly, the dowdy, and the angular, with the conviction that, if it is not beautiful in the common sense, it is art in the New English sense. An ordinary being, like myself, meekly bows his head to landscapes which look like seascapes, to cattle pieces which pass very well for tree studies; to irregular patches of blue, red, brown, and white, which are said to be Italian or Oriental views, and might form pleasing designs for the patchwork quilts of former times; to painfully photographic representations of greengrocers' shops; to the interiors of commonplace bedrooms, with jugs, and basins, and all; to views of a lamp-post and railings (price 8*l.* 8*s.*)—and passes on. The new (English) art defies both his comprehension and his sense of appreciation.

Still, it is not just of me to let my readers imagine for more than a moment that the fourteenth Exhibition of the New English Art Club, which opened at the Dudley Gallery (same place as the Salon, you see) on Monday last, is monopolised by works which only appeal to the self-deluded few who admire the eccentric, the unconventional, and the uncommon. No. There are pictures of real beauty and cleverness there which, like all good creative or imaginative works, arrest the eye and strike the mind of even the humblest and least critical of us. Mr. Wilson Steer's studies of a girl before *The Looking-glass* and *Disrobing*, Mr. G. Thomson's finely drawn and coloured girl instrumentalist, *The Guitar Player*, Mr. Warrener's *Toilet of an Extra Lady*, a girl arranging her toilet before a glass, are each worth studying by the photographer who seeks to acquire the great art of gracefully posing the human form. I admired these. I admired also Mr. Moffat Lindner's gorgeous cloud-forms, Mr. Buxton Knight's English landscapes, Mr. James L. Henry's view of Boulogne in a waning light, and many other works which I need not trouble you by naming. What I most wish to say is that, to those who want to keep up with the latest tendencies of contemporary "art," a visit to the Dudley Gallery just now is necessary. Among other things, it will show a photographer that some of the members of the "Linked Ring" are mere imitators and copiers, in monochrome, of the mannerisms and insanities of some of those who work in colour and look upon the Royal Academy as an effete and fossilised institution.

Although I only use a comparatively small quantity of cut gelatino-chloride paper, I readily perceive the common sense of my friend Mr. W. B. Bolton's suggestions that the makers can well afford to cut to smaller sizes and give more paper, and that, by packing in larger quantities, a terrible superfluity of wrappings and printed matter may be dispensed with. The ideas are certainly worth the attention of the firms concerned. One naturally passes from the packing of paper to the packing of plates, in reference to which I take the opportunity of saying a good word for the plan adopted by, I think, Messrs. Marion, Messrs. Cadett, and Messrs. Thomas, of packing half-plates face to face without severing the film at the cut of the glass. This is an ideal method of packing, and deserves to be more generally adopted where the cutting down from larger sizes allows of it.

I suggested a few weeks back that photographers might profitably introduce to the notice of their sitters a new style of portraiture, that is, collotype or "half-tone" portraits printed on note paper. I hope my professional friends will bear the hint in mind. Curiously enough, a day or two after my suggestion was printed, I came across an advertisement of Messrs. Beeching, the well-known stationers of 174, Strand, which, as it proves that, in the estimation of a business firm, the note-paper portrait idea is a good one, I have no hesitation in reproducing, in order that photographers may benefit by the example of up-to-date enterprise which it sets:—"Don't Waste Photographs!!—240 sheets superfine note paper. Printed perfectly, with your latest photograph and name and address. With envelopes to match. From 20*s.* Cash. Post-free. Invaluable for securing engagements." I hope Messrs. Beeching will accept the gratuitous advertisement I am here giving them, at the risk of a rebuke from the proprietors of this Journal, as some set-off for inciting photographers to follow their lead.

Drawing attention recently to the multiplication of periodicals relying for their attractiveness, wholly or in part, on phototypically reproduced views of familiar places and portraits of "celebrities," many of the latter being manufactured for the occasion, I ventured to express the opinion that the "new" (?) departure in popular illustration was being worked to excess—was, in fact, overdone. Since then I came across a remarkable confirmation of my opinion in the report of an interview which a representative of the *Publishers' Circular* had with one of the largest booksellers in the South of London. This gentleman is quoted as thinking "the photo business is getting a bit overdone, with the exception of *Round the World;* the others have a poor sale here." It is probable that the process "boom" will yet run a considerable time, and that much money will continue to be made out of it; but to those who are contemplating launching new phototypically illustrated publications the word of caution conveyed in the above-quoted opinion is of importance, and should be well and carefully weighed.

There seems to be an impression, judging from recent references to ammonium carbonate for development, that the white powdery body

into which the substance is converted after long keeping or exposure to the atmosphere is useless in development. The other day I used some with metol, employing just so much as I might have done had the carbonate been of the freshest and most non-pulverulent kind, and found it act in the slow and deliberate fashion which Mr. Matthew Wilson appears to desiderate, but with all desirable energy. It is true I was developing transparencies on old ordinary plates, on which, I may remark, I obtained the most wonderful specimens of dichroic fog I have had for years, a phenomenon that disappeared by the substitution of sodium carbonate for the ammonia. It may interest the curious to know that ammonium carbonate is the only inorganic salt with a smell.

Talking of the development of transparencies, I append a formula that is a favourite of mine, and which, for lantern slides or transparencies, yields tones of a peculiarly pretty warm black, varying with the particular plate used, but always of an agreeable kind. I think Mr. Wellington first recommended the formula:—

Pyro	3 grains.
Sodium sulphite	12 „
Bromide of ammonium	3 „
Carbonate „	6 „
Caustic potash	5 „
Water	1 ounce.

I have more experience of it for large transparencies than for lantern slides.

It looks quite novel and strange, does it not, to see printed in these pages a formula for a pyro developer? Yet, I suppose, after all, despite the strenuous advocacy of other developing combinations, pyro-ammonia is still first favourite with practical men for negative work, and that ferrous oxalate for bromide paper positives has not been displaced to any extent. It has been my lot to try all the new developers, and many modifications and mixtures of them, and the result is to put me in perfect sympathy with the gentleman who, I am told, declared, in the course of a discussion on developers, that if pyro were only now introduced as a new developer, it would be hailed as a great discovery.

A correspondent pays me a compliment which is as pleasant as it is undeserved. He asks me to explain, in my "usual clear and sensible fashion," the three articles headed "From Sunshine to Shadow and Back," which Mr. Hugh Brebner has recently published in the Journal, and to say, in a paragraph, "what the author is driving at." The task is beyond my powers, and I must therefore respectfully, but firmly, decline to attempt it. I have carefully perused the articles referred to. They appear to discuss the phenomena of reversal and halation, but, at the risk of confessing my ignorance or stupidity, I quite fail to detect their drift, in either a theoretical or practical direction. As there may be others who, like my correspondent and myself, are puzzled to know what Mr. Brebner is writing about, may I, in the most courteous manner, ask that gentleman to tell us?

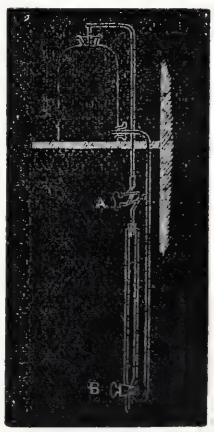
"Omega," who writes on March 29, complains very properly, I think, of the fundamental error in conducting the Photographers' Benevolent Association, namely, by not making paying membership a condition of participation in its benefits. At the same time, it must be pointed out that a "Benevolent" Society is, from the point of view of the political economist, a fundamental error *ab initio*, nay, cannot well be otherwise. Benevolence, especially when it takes the form of money gifts, or lending without security, saps self-reliance and independence, and is a sure creator of paupers, idlers, and spongers. This may conflict with the divine doctrine of the eight beatitudes, but it is hard, imperishable fact all the world over. I see no permanent hope for the Benevolent unless it is conducted on the lines of a benefit society, with its advantages and benefits dispensed in accordance with actuarial calculation, and only available to paying members.

There is a lesson to be learned, even by photographers, from the terrible case that men are still talking of with shivers of horror. It is this: That our preferences in art and taste, in ethics and æsthetics, and in literature, are nowadays commonly formed and held, not from within, but from without, and under individual domination and influence. So long as that influence is maintained, whether by vanity, audacity, conceit, or any other form of fraud, so long is the oriflamme of the particular Movement or 'Ism held aloft and fought for with gallantry and devotion. Let the leader be exposed as a quack, a charlatan, an impostor, and what becomes of the "views" or teachings he has propagated? They fall with him. From the adoration of the sunflower to "æstheticity" of dress, decoration, and furniture, Society has been led by the nose to worship a form of literature which, under the plea that it was art, was beginning to transcend even Parisian foulness, while the thin edge of the wedge was being driven into the literature of the public stage. But all that is now happily dead and past. What I want to ask is, how long we in photography would tolerate fuzzyism and its gospel if one of its apostles were found guilty of murdering his mother-in-law, another of blowing up the Council of the Royal Photographic Society with dynamite, and a third of garotting Dr. Emerson? Fuzzyism might then not improbably die. I am putting the case very roughly, of course, but it, nevertheless, illustrates with sufficient clearness my point that in "art," as in politics and theology, we are swayed by the personality, the genius, the cleverness, the persistence of the man himself, and that what he is teaching becomes only of secondary concern or importance to us.

Cosmos.

ARRANGEMENT FOR DRAWING OFF SMALL QUANTITIES OF DEVELOPERS.

Using, as I do, ten per cent. solutions of pyro, ammonia, and bromide, I often experienced great inconvenience in pouring out, either from a bottle or a glass, the small quantities which are required, especially in the dim light of the dark room. I have therefore devised the following arrangement, and have used it with the greatest comfort and convenience. It consists essentially of three aspirator bottles and three self-filling burettes. So far there is nothing new in this; but it is necessary to exclude the air from the developer, so a tube connects the top of the burette with the top of the aspirator bottle. It is obvious, however, that, unless provision were made for the admission of some air, no developer would flow. A three-way glass cock, A, therefore intercepts the tube, and is so constructed that, by turning it in one direction, there is a free passage of air from the burette to the bottle. This allows the burette to fill, the cock, B, being, of course, in the proper position, but no air from the outside can enter the apparatus. When the cock, A, is turned 180°, the burette is in communication with the outside air, and can be emptied by turning B 180°. By turning both cocks 90°, all communications are stopped, and by no possibility can any outside air get into the bottle. I use 10 c. c. burettes, but the divisions are too indistinct to be seen in the dark room, so I have made a cardboard scale divided into half-cubic centimetres, and placed it at the back of each burette. A black line one-eighth of an inch thick is ruled down the centre of the scale immediately behind the burette, which greatly facilitates the reading. The three burettes are fixed in a row beside my dark-room lantern, in which I have cut a lateral window, and now I can draw off half or a quarter of a cubic centimetre of ammonia or other constituent with the greatest ease and certainty. If the handle of each cock is marked by pasting a piece of paper on one end of it, no mistake need be made as to which way to turn it. For convenience I have pasted a piece of paper on what should be the bottom end of the cock when the developer is running out. This may seem complicated to describe, but in use it is perfectly simple. Before commencing, all cocks are horizontal. To fill the burette cock, A is first turned with paper mark upwards; B is then turned up until the burette is full; A is turned downwards, and then the burette can be emptied by turning B downwards. When development is finished, the cocks are turned horizontally, and, as in this position no air can enter, the burette may be left partially filled, so no developer need be wasted.



Wilson Noble.

ON THE CORRECT RENDERING OF COLOUR VALUES.

The correct rendering of colour values by means of photography is, at the present moment, the chief topic of discussion in photographic circles. Renewed interest in the subject has been awakened, on the one hand, by the appearance upon the market of a plate which stands out pre-eminently for its correct rendering of values; and, on the other, by the competition which recently took place under the auspices of Messrs. Fuerst Brothers. That this question is one of the very greatest importance there can be no two opinions, and the fact that over 300 competitors made a bid for the prizes offered further testifies to the great interest photographers in general take in the matter. Having, during the last few months, made a large number of experiments, with a variety of plates under different conditions, some of the conclusions I have arrived at may be of interest to your readers. It is impossible for me to treat the subject as I should wish, because, to do so, it would be necessary to reproduce a large number of photographs which could only be done justice to by methods which would involve very great expense. I shall therefore have to content myself with a few generalities.

The colour test which I have used in my experiments is the diagram issued by *Cassell's Technical Educator*, to illustrate Lessons on Theory of Colour. I find, on photographing this in daylight, without a screen, that very little difference is to be observed in the results produced by the following plates:—Barnet Studio, Ilford isochromatic, Lumière B, and Lumière C.

This points to the fact that, in copying pictures in daylight without a screen, little or nothing is to be gained by using orthocromatic plates. All the negatives were taken under exactly the same conditions of exposure and light.

In using ordinary lamp light the values are much better rendered; still, however, the red end of the spectrum is the least actinic, and the blue is rendered much lighter than the yellow, the green being placed midway between the two.

My best results were obtained by the use of yellow artificial monochromatic light, when orthochromatically the true values were given upon the Lumière C plate. I used two sixty-candle power Belge lamps, with reflectors at the back made of sheets of white cardboard. Between the source of the light and the colour diagram was placed a sheet of yellow tissue paper. All the plates mentioned above were tried with varying results. The exposures were, of course, different, and varied from two minutes with the Lumière C to twenty-five minutes with the Barnet Studio. In this experiment there is no doubt as to the superiority of the colour value rendering of the Lumière plates. There are, however, two factors which govern the perfect rendering of values. The first is the depth of colour of the monochromatic light or screen; and the second, the length of exposure. Development, as far as I can make out, plays no part in the matter.

There is a large field for inquiry open to those photographers who have the leisure and ability to undertake a research in order to discover the proper screen, and the length of exposure necessary to produce perfect results. On looking over a number of screens a few days since, I was struck with the marked difference in depth of colour displayed, and could not help thinking that the gaining of a position in the competition I have mentioned might, to a great extent, be a question of luck.

The chief object I have in writing this article is to elicit from the readers of The British Journal of Photography an opinion as to the order in which the colours in fig. 2. of the plate I have mentioned should be placed. Captain Abney, by means of photometric measurement, has placed them in the following order:—

Yellow	1
Blue	2
Violet	2½
Green	3
Orange	4
Red	5
Orange-red	6
Citrine	7
Sage	8
Slate	9
Russet	10
Plum	11

From an orthochromatic point of view surely this order must be wrong. I have asked a number of gentlemen to separately mark these colours in the order they see them, and I find that the consensus of opinion was in favour of placing them in the following order:—

	Order of popular vote.	Order in which I place them.
Yellow	1	2
Orange	2	3
Violet	3	4
Red	4	5
Green	5	4
Blue	6	7
Orange-red	7	6
Citron	8	9
Russet	9	12
Sage	10	13
Slate	11	15
Plum	12	16

Having, through the kindness of Messrs. Fuerst, been allowed to inspect the photograph which took the first prize in the competition, I was (after having seen Captain Abney's figures) surprised to find that the order more nearly approached that obtained by popular vote than the order in which they are placed by scientific measurement. In viewing the figures there can be little doubt that russet appears darker than slate, and I find it is so placed in this photograph. Captain Abney's measurements, however, placed them the other way about. What struck me most, however, in viewing the prize picture, was the fact that the white paper is rendered by a dirty mud colour. Surely, in measuring the values of this test diagram, the extremes should be the black and the white, and the other colours should fall in their proper places between these extremes. How can a proper rendering of these values be given upon a print which renders white a dirty mud colour? The relative values between the colours may be depicted, but, if we are only to get the values correct by losing the whites, I am afraid the practical value of such plates will be *nil*. However, it is quite possible to get the white, and still retain the relative value of the colours (as the photograph sent herewith will show). Knowing this, I was more than surprised to find that the prize had fallen to a picture which does not render white as white, and, having seen the work of several other competitors, I cannot understand how this picture gained its position, unless size had something to do with it. The negatives were of course, judged with the prints, but, even should it be urged that the picture is over-printed, the ratio value should not be altered.

In calculating the relative values of the colours in the test diagrams, it appears to me that white should be taken as the standard, and that the colours should take their places between it and the black. Calling white 1 and black 20, yellow should be 2 and plum 16; that is to say, that four different shades of colour might come between plum and black. Now, to place all the colours in their proper order, the mixed colours should be represented by adding up the figures representing the pure colours, thus:—

Yellow 2
Blue .. .. .. 7 } = Green .. 9.

As, however, the green in the plate does not represent a mixture of the blue and yellow, in this case the number 9 does not represent green.

Let us, however, take a mixed colour, which is formed by printing three pure colours one over another:—

Violet 4
Red .. .. 5 } = Plum 16.
Blue 7

Now let us take the figures representing the pure colours in Captain Abney's scale and add them up to represent the mixed colours:—

Orange-red (orange 4, red 5, and yellow 1)	will	= 10
Citrine (yellow 1, orange 4, and green 3)	„	= 8
Sage (green 3, yellow 1, and blue 2)	„	= 6
Slate (green 3, blue 2, and violet 2½) ..	„	= 7½
Plum (violet 2½, red 5, and blue 2)	„	= 9½
Russet (violet 2½, red 5, and orange 4) ..	„	= 11½

This is obviously incorrect, as it makes russet the darkest and orange-red (which is the lightest) the darkest but one. Captain Abney does not place them in this order, but, at the same time, he makes russet darker than slate; and, whilst he makes blue much lighter than red, he gives the prize to a picture which makes blue much darker than red. This latter, I contend, is as it should be; but I cannot reconcile the photometric measurements with the appearance to the eye and with the results produced under the most favourable circumstances by orthochromatic photography.

The order in which I place them from viewing a large number of prints not only coincides with my results, but in all but one instance (orange-red) the totals of the numbers representing the pure colours

give the position the combination of these colours should occupy. I am bringing these points before your readers in the hope of raising a discussion on the matter. I feel quite certain myself that the Lumière plates do, under proper conditions give a correct rendering of these values (including black and white), and it appears to me that the points I raise go to prove that accurate scientific measurements give us but little idea of what we shall expect to find in actual practice.

HALL EDWARDS, L.R.C.P.

CAMERA CLUB CONFERENCE.

RESUMING our report of the above, on Wednesday afternoon, April 3, the chair was taken by the Rev. F. C. Lambert. Dr. Hall Edwards read a paper on the subject of *The Correct Rendering of Colour Values.*

Dr. Edwards, having disclaimed his ability to bring anything new before the Conference, said that the subject was, however, of such great importance that a discussion of it would probably be productive of good results, and therefore he asked them to look upon his paper more as the introduction to the discussion than as anything else. Great attention had of late years been given to the subject of orthochromatic photography, and this had been further stimulated by the recent appearance in the market of a new series of colour-sensitive plates. He had previously drawn attention to the futility of collective investigation in this branch of the art, and pointed out that the results obtained in the Lumière Colour Value Competition added one more to the list of failures, because no definite conclusion had been arrived at. One might have imagined that, out of 300 competitors, each striving to give the best rendering of colour values, some definite method of manipulation would have been asserted, or else the working or the most effective materials would have been determined; but the fact was that very different results had been obtained, and the three first prizes had been won under very varying conditions. He could not help concluding that the prizes were purely accidental, and he considered that, if any advance was to be made in the theory and practice, it must be by the steady application and study of the individual. The lecturer then proceeded to explain his own experiments in regard to the rendering of colour, and quoted the value of colours as given by Captain Abney, Mr. Bothamley, by the popular vote of some eminent photographers, and the mechanical order as favoured by himself, all of which differed from one another.

In the discussion which followed, Mr. Fuerst was afraid that if they adopted the visual measurement of colour, they would never arrive at any conclusion.

Mr. Cadett thought it was impossible to make proper experiments without instruments by which they could measure with mechanical accuracy; but even, of course, measuring colours by the photometer was dependent upon the visual appearance. He had heard good accounts of Lovibond's Tintometer, and thought that by its use they could get more exact measurements.

Mr. Lovibond referred to the chaos which exists as to the nomenclature and value of colours, and thought the question was not one so much of the difference of colour value as the difference of colour depth. There was no difficulty in bringing the whole thing to an issue by direct measurements of the depth.

Mr. Wall took exception to several of the conclusions of the lecturer, and contended that far more would be learnt about the correct rendering of colours if photographers worked with the spectrum rather than with pigments. He pointed out, in support of his views, that the personal equation was in many cases the dominant factor.

Mr. Pringle, while agreeing with the last speaker as to the value of the spectrum from the theoretical point of view, pointed out that, as photographers had to deal with artificial colours and with artists' pigments, the question of their correct reproduction was of practical necessity and value. For the purpose of competition and for the purpose of practical photography, probably the ulterior experiments would have to be upon pigments.

Mr. Newman believed that Mr. Pringle had cut the knot, and regretted that there was any suggestion in the remarks of Mr. Wall as to the difference between scientists and artists. While, of course, they wanted to scientifically give a correct rendering of natural colours, they must at the same time be practical. He did not want to see the old steel engraving done away with unless photogravure could give them something better or equal to it.

Mr. Burchett spoke of the advantages of photographing pictures in dull light.

The Chairman concluded by pointing out that, while the scientific method was undoubtedly to deal with the spectrum, as a matter of fact they did not get the spectrum banging on a tree. While they had to deal with the actual colours in nature, they also had to deal with the artists' pigments.

Dr. Edwards, in reply to a hearty vote of thanks, said, if they wanted to use photography to copy pictures, they must learn the value of colours, and obtain the correct method of reproducing them.

Mr. Dennis Taylor read the next paper on *Telescope Star-images in relation to Photography.* He said that, while the great majority of photographers had exerted their skill exclusively on terrestial objects, yet there were a few who turned their practical attention to celestial photography, which, as many of them were aware, was claiming an ever-increasing number of devotees among astronomers, who were extending its applications in all directions to reveal objects in the skies which no human eye had ever seen, not even with the most powerful telescopes. Having explained the advantage which a sensitive plate had over the retina of the human eye, the lecturer defined the limitations of celestial photography under four heads: Mechanical limitations, optical limitations, atmospheric limitations, and limitations depending upon certain well-known characteristics of the sensitive film. From these causes pictures of the solar and stellar space deviate in a marked degree from what they ought to be. The lecturer then described his own method of procedure, and exhibited a number of slides of photographed stars, which he pointed out in many cases necessarily appear nothing more than brilliant points of light. He showed a photograph of the sky containing a large number of stars, and pointed out that, while the faintest stars had only just registered themselves as scarcely discernible dots, the brighter ones had spread out so much as to overlap and conceal lesser stars. Captain Abney had said that a photograph of a region of stars, taken with a perfect telescope in conjunction with a perfect plate, should show all stars, whether faint or bright, of about equal size, the differences in brightness or magnitude being measured only by the varying degrees of density in the silver deposit. It was worth while to notice that, supposing telescopes were always able to give perfect star images, and there were no scattering of light in the film, yet the coarseness of the grain of the photographic plate was such as to preclude a perfect image, the grains of the film being relatively two and a half times as large as the true star image. If an object-glass could be produced which would refract all the colours of the spectrum to one focus with as much accuracy as a reflector, there would only be the moderate exaggeration which was brought about by light disturbance and the light-scattering action of the sensitive film, and he had designed a new object-glass which fulfilled these conditions.

Mr. Cadett, referring to the demand for a plate of extreme sensitiveness and with a very fine grain, said he wished he could produce such a plate—there would be a fortune in it.

Mr. A. Kapteyn asked the method of measuring the magnitude of a star?

Captain Abney said the *beau-idéal* of an object-glass for photographic purposes was one in which all the foci would combine as in a reflector, and with such an instrument the star discs would nearly approach the theoretical image of a point. He described a method of measuring star magnitudes which he had invented which did not require a micromoter, and took into account not only the diameters of the star discs but also the density of the deposit. The system consisted in passing a beam of light through a small hole in a metal plate so as to produce a disc upon the screen; a negative was then placed behind the plate so that one star appeared in the centre of the disc, which then showed as a black nucleus with a transparent halo; the brightness of the disc could then be measured by photometry, and, upon another star being placed in position, the relative amounts of darkening of the screen showed the magnitudes of the stars.

Mr. Dennis Taylor, in the course of a brief reply, said the usual way of estimating magnitudes was by measuring the diameters of the star discs on the photographic plate, but, of course, the result was only approximately correct. The great discrepancies which sometimes existed between the registered photographic magnitudes and their visual magnitudes, was due to the fact that the stars in question were very rich in actinic rays, and produced a far larger disc than their visual brightness would warrant one in expecting.

TEMPERATURE AND EXPOSURE.

At the evening meeting, Captain Abney read a paper on *Temperature and Exposure; a Further Variation from a Photographic Law.* After referring to certain experiments which he published in 1884, as to the effect of heat in increasing the sensitiveness of the photographic plate, he described a further series of experiments at the temperatures at which photographers had to do their work, varying from −18 C. to +33 C. He found that varying temperatures produced no variation in gradation, the curves being generally parallel to one another; the rapidity, however, was altered, though not in the same degree with each plate or surface tested. A lantern plate was found to require at a temperature of zero more than twice the exposure necessary on a hot summer day. A plate marked 120 Hurter & Driffield required at −16 C. seven times the exposure for +33 C. Experiments of this kind should not be confined to gelatine, and the result of experiments with collodio-bromide plates showed that at −17 C. an exposure was required of 4·5 times what would produce the same effect at +32 C. The different result given with a celluloid film ought to be accounted for somehow; it might be that the shrinkage and expansion of the sensitive films was controlled by the surfaces upon which they were placed, and that the amount of shrinkage, small as it was, might account for the difference. The gradation was found to change when the temperature exceeded +33 C., the curves being no longer parallel. It was probable that at +38 C. the water in the gelatine began to be diminished, and that the condition of the film was thereby altered. The question of whether exposures to different intensities of light was equivalent to a fixed intensity and varying time had also engaged Captain Abney's attention, and he found that the effect

of heat was to increase the apparent rapidity of plates with time exposures, and to increase the steepness of the curves with intensity exposures.

Captain Hills asked what would be the effect of repeated heating.

The Rev. F. C. Lambert asked whether any difference was apparent if a plate was exposed at a low temperature and then heated.

Captain Abney said after-heating had no effect.

Mr. T. C. Hepworth made an experimental camera some time ago in which a tank of boiling water was placed behind the dark slide, and fancied that he got extra density. He suggested that such a course might be useful for photographing badly lighted subjects.

Mr. Davis suggested that Captain Abney's experiments might explain the old adage, "When the wind is in the east, double exposure at the least."

Mr. Cadett had tried a boiler behind the dark slide, but the gelatine film "didn't like it," and frilling ensued. Mr. Sterry had made some experiments in this direction, and found a difference of twenty per cent. between the sensitiveness of an absolutely dry plate and one containing the amount of water present at ordinary temperatures.

Mr. A. Kapteyn said the amount of moisture left in the plate would have an important bearing upon the result.

Mr. A. Pringle asked for an idea of the difference caused by the ordinary variations of the temperature of the laboratory. What was the practical use of the experiments?

Captain Abney said the result of repeated heating was fog. Mr. Sterry had confirmed his results, but had made no allusion to the elaborate set of experiments which he (Captain Abney) had carried out, and he could not help thinking that such a course would only have been graceful on Mr. Sterry's part. Absolute dryness diminished the sensitiveness of a plate so far as concerned the period of under-exposure. He did not care a bit for the utilitarian part of the subject, as suggested by Mr. Pringle, but only for the advancement of photography. The experiments might not be commercially useful to-day, but they might be some day, and no doubt Mr. Pringle would be ready to help to make them utilitarian.

Instantaneous Photo-micrography.

Mr. Pringle read a short note on *Instantaneous Photo-micrography*, and described an apparatus which he had designed, by means of which the changes undergone by the lower organisms might be watched and photographed instantaneously at any period.

Dr. Hall-Edwards asked what light would be required to take an instantaneous photograph of bacteria with a one-twelfth inch lens?

Mr. Pringle said he had photographed his own blood to 375 diameters with ordinary limelight. With an electric arc light he thought he could photograph up to 1000 diameters.

Mr. Gee asked whether the eyepiece was on the microscope at the time of exposure.

Mr. Pringle said that in the photographs he had shown the ocular was not used, but when he required greater magnification he should probably employ it.

Dr. Stanley Kent thought Mr. Pringle's apparatus would fail with high powers.

Mr. Lyonel Clark referred to an instance in which sunlight was employed, with the result that the specimens were boiled. He suggested that an electric spark might be utilised.

Mr. Pringle said he was confident that, with an electric spark, or with sunlight guided by a heliostat, he could get all the results he required; he was not in the least afraid of boiling his specimens.

Dr. Stanley Kent pointed out that, when using an electric spark, the intervals between the exposures could be readily recorded.

Captain Abney said the duration of the electric spark was about one-millionth of a second, and, although the light was intensely bright, the time of exposure would be so short that he doubted its utility.

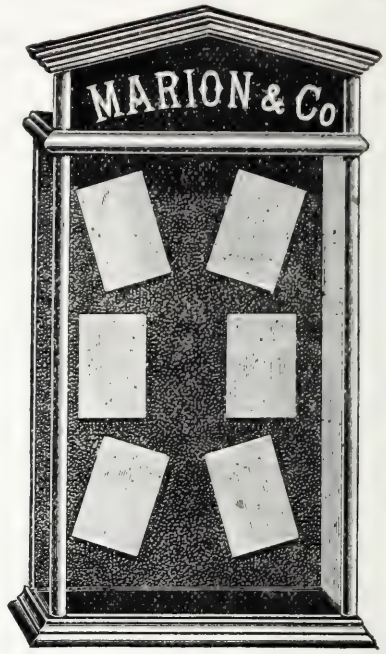
THE GAS CYLINDER EXPLOSION.

On Thursday, April 4, the adjourned inquiry was held by Mr. Langham, into the circumstances attending the death of William Holbrook, aged fifty-five, who was killed by an explosion of a gas cylinder at Fenchurch-street Station. The same counsel appeared as on the previous occasions, and Mr. Dupré, of the Home Office, was in attendance as an expert. The court was again crowded. Mr. A. Clarkson, of Bartlett's-buildings, Holborn, who supplied the cylinder which exploded to Messrs. Newton, said he obtained his cylinders from Messrs. Stewart & Clydesdale, of Glasgow, and before sending them out they were thoroughly tested and a certificate given to the effect that they were in perfect condition. Under no circumstances had witness ever used the pump which supplied oxygen gas to fill a cylinder with hydrogen. Mr. J. B. Spurge, manager to Mr. Clarkson, said he could find no flaw in either the testing or gas-filling apparatus, and he could in no way account for the explosion of the cylinder. Dr. Dupré, for twenty years chemical adviser to the Home Office, deposed that he had examined Mr. Clarkson's workmen, and also his machinery, and he found everything perfectly satisfactory. As to the immediate cause of the explosion, he had come to the conclusion, first, that the bottle contained an explosive gaseous mixture; and, secondly, that this mixture was fired by some portions of finely divided iron, or perhaps grease, igniting in the compressed gas. That some iron had actually been on fire in the cylinder the condition of the screws plainly showed. Asked whether he thought the screws had been greased, Dr. Dupré said there was evidence of this now, but whether the grease was there from the fact of its having been forced from the washleather of the valve through the explosion he could not positively say. He did not think the presence of iron filings had anything to do with the explosion. Replying to the jury, Dr. Dupré said he intended making representations to the Home Office with regard to better regulations being put in force in connexion with the carriage of these gas cylinders. The jury expressed their satisfaction at hearing this. The Coroner having summed up at great length, the jury, after twenty minutes' deliberation, returned a verdict of accidental death, and added, "We recommend that all compressed gases of an explosive nature should be scheduled under the Explosives Act; that cylinders be tested by the Government periodically, and no cylinder be allowed to be used or conveyed about unless bearing the Government stamp; further, that all manufacturers should be licensed by the Board of Trade in future; that separate hydraulic pumps be used in the apparatus in filling the cylinders; and the jury also recommended a Board of Trade and railway inquiry."

SEASONABLE NOVELTIES.

A Convenient Show-case.

The show-case shown in the cut is a very elegant affair, being both handsome and attractive. It is made in polished white hard metal which retains its brilliancy. The front and sides are formed of plate glass and the case is lined plush. Such cases as these are specially suitable for

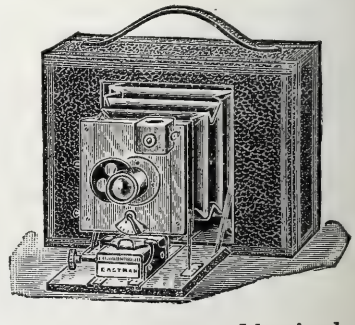


out-of-doors, passages, railway stations, and similar places. The name at the top indicates where that and the address of the photographer is to be placed. It is made in various sizes, from 20 × 30 in. up to 36 × 36 in.

A Flat-folding Kodak.

The Eastman Company has lately introduced a "flat-folding Kodak." In the flat-folding, the Kodak principle is applied to a camera that is not only extremely small and light, but of such shape as to be almost no trouble to carry. It is for film only, and has capacity for forty-eight exposures. Size is only $3\frac{1}{2} \times 6\frac{1}{2} \times 8\frac{1}{2}$ inches, and weight loaded for forty-eight exposures, 3 lbs. 4 ozs.

This camera is specially suited for cyclists, as it can with ease be carried on any make of machine, either resting on the handle bar or suspended from the framework. It combines lightness, compactness, and portability, while for making an exposure the operations are few and simple.



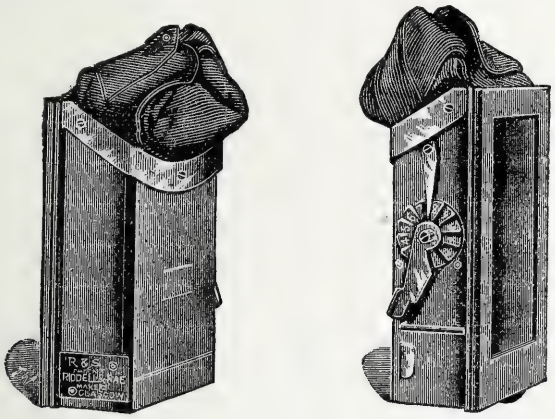
The flat-folding Kodak takes a picture 5 × 4 inches. It is fitted with a reversible finder for horizontal or vertical pictures; the lenses are perfectly rectilinear and very rapid, and are provided with revolving disc and set of four stops. The speed of the shutter can be altered by simply

moving a lever, and focussing done to a nicety by means of a rack and pinion. The roll-holder has several improvements, such as a novel device for registering the number of exposures made, and an arrangement whereby overwinding the film is impossible.

The flat-folding Kodak is thoroughly well made in every way, covered with black morocco and handsomely finished in mahogany and brass.

A Novel Changing Box.

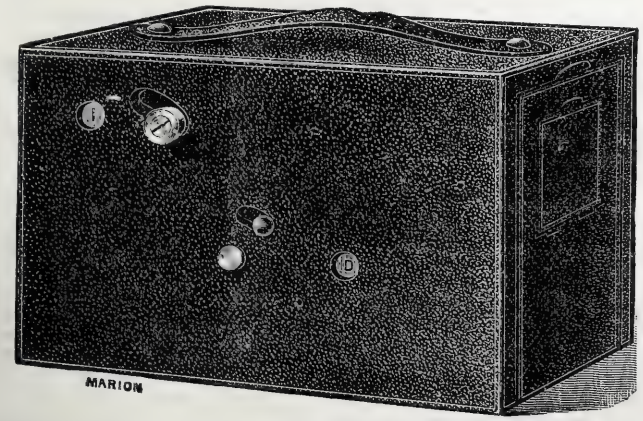
This has quite recently been introduced by Messrs. Riddell & Rae, of St. Vincent-street, Glasgow. It forms at once a reservoir and a dark slide. There is a flexible bag at one end from which the back plate can readily be drawn up and transferred to the front, ready for exposure. There are no sheaths employed, and the plates may be inserted just as they come from the makers, care of course being taken that all the faces are to the front. A query will arise as to how the second plate is prevented from getting damaged by the light which falls upon the front one during the exposure. But here comes in the ingenuity of the system, for when the front plate has been exposed an opaque shutter is withdrawn and the plate falls back, for which ample room is afforded by the releasing of the pressure behind, and which permits of the back plate of the series being transferred to the front, and separated from the others by the opaque shutter now returned to its place, when the tension of the spring at the back is restored. The whole thing occupies little more thickness than a dozen plates of glass, for there are no sheaths. The



cuts show both the plain slide with its bag, and also the method by which the pressure of the spring is relaxed and simultaneously the number of the exposure recorded. Very little practice suffices to educate one into the transference of plates with ease and celerity.

The Persé Film Camera.

This new hand camera of Marion & Co. is adapted primarily for cut films, of which it can carry from fifty to seventy. They are separated from each other by a card, which prevents the light from passing through the film being exposed to the next in rotation. The Persé is for films of quarter-plate dimensions, and these are stacked in the camera in their



entire form, that is, without having to be notched. As will readily be understood, to enable each to be brought to the exposing plane and then drop down into the reservoir, the intermediate card must not be quite the same size as the film. In the Persé, any ordinary make of film may be used, and it may be charged with only one film at a time, or with any number up to seventy. In front of the lens is a time and instantaneous shutter, which always retains the same relative position to the lens. Both the lens and shutter are fixed on a rising and cross front. Focussing is done by moving an index lever over a graduated scale. The door at the front is hinged, and can be opened in a moment to alter the speed of shutter, diaphragms, or adjust the rising front. The drawing shows the external form of the Persé, which is a seasoned mahogany case covered with black morocco, and having no other projections than those shown in the cut.

Our Editorial Table.

Birds, Beasts, and Fishes of the Norfolk Broads.

By P. H. Emerson, B.A., M.B., M.R.C.S., &c. London: David Nutt, 270-271, Strand.

Before one has got half through the first page of this volume, he will have concluded that Dr. P. H. Emerson is not only a lover of birds, but that he possesses a very complete and minute acquaintance with them, their characteristics, their outgoings and incomings; and, as we read on, we discover his possession of an equal knowledge of the beasts and fishes that frequent the "Broads," and incidentally with those of other localities. In a word, he is a well-informed naturalist.

The work has no connexion with photography, except that it contains numerous photographs by T. A. Cotton, illustrative of some of the topics treated. Many of these are nests and their eggs; some, and these are the best, are from collections, while two or three are from life. The preface to the book is in Dr. Emerson's well-known style, and he does not scruple to point out, in a more or less trenchant manner, the errors to be found in some authors of works on a similar subject. The book abounds with numerous attractive word pictures, and is well got up.

The Camera Club Interchangeable Album.

Marcus Ward & Co., Limited.

This forms a useful album for quarter-plate prints, which can be easily inserted and withdrawn (hence the term "Interchangeable")



by means of a wide slot beneath each. For insertion, the prints need not be mounted. The cut shows its form.

We have received from Mr. R. Crook, 96, Lordship-lane, Wood Green, a few small samples of his double albumenised sensitised paper. It prints rapidly and tones evenly with any of the usual formulæ. It is claimed that it never blisters, and that it will keep for twelve months.

Taylor, Taylor, & Hobson's Catalogue of Lenses.

The thirteenth edition of this catalogue contains all the productions of this firm up to date, with the exception of the new "Cooke lenses," particulars of which are to be issued shortly as a supplement. The catalogue contains thirty-six pages, and is quite full of useful information concerning lenses.

News and Notes.

Royal Photographic Society.—On Tuesday, April 16, the first of the special meetings devoted to photo-mechanical processes will be held at 5 Great Russell-street, at 8 p.m.

Mr. A. L. Henderson informs us that he attended (by command of the Queen) at the Villa Lizarb, Cimeiz, last Friday. Several excellent snap-shot and other negatives of the Indian jugglers were taken.

Backing Lantern Plates.—Mr. J. Hedley Robinson writes: "Referring to the concluding paragraph of the article in your last week's issue by A Kapteyn, I should like your readers who are interested to know that the makers of Forrester's Effective Backing have always advocated the backing of all lantern plates, whether for use in the camera or by contact, and that Messrs. B. J. Edwards & Co. send out any of their plates backed with the above at an extra cost of 6*d.* per dozen up to half-plate, and 1*s.* for whole-plates. The retail agents for the backing are Messrs. Newman & Guardia, of Shaftesbury-avenue; it certainly is the best I ever used, and it is put up in a handy form, viz., in collapsible tubes."

It is high time for lovers of illustration to protest against the ousting of the artist by the commercial camera, and Sir Frank Lockwood did well on Saturday to draw attention to the piteous state of the young draughtsman walking from illustrated paper to illustrated paper with a portfolio of clever drawings under his arm. It is absurd to deny that the camera may produce true works of art, and we are all quite willing to see it play its part in the illustrated journals of the day; but, when it threatens to deprive us of the work of the pen and pencil in quarters where we have always delighted in, then we must declare war upon it. The hand camera will soon be a public nuisance, and we are not surprised that in France, where the mania for "snapping" everything and everybody is even keener than here, legislation is already on foot against it.—*Daily Chronicle.*

The Lake District Camera Club, Windermere.—*President:* Mr. J. R. Bridson, J.P., F.R.A.S.—*Vice-Presidents:* Major Dunlop, M.A., J.P., Messrs. Paul Lange (Ex-President of the Liverpool Amateur Photographic Association), and G. H. Rutter (Ex-President of the Liverpool Amateur Photographic Association).—*Hon. Treasurer:* Lieut.-Colonel Reade, The Larches, Windermere.—*Hon. Secretaries:* Messrs. W. H. R. Kerry, F.C.S., Wheatland, Windermere, and Fred. B. Cattley, Hazelwood, Windermere. This Club is circulating the following circular among photographic Societies:—"We are instructed to inform you that the above Club has lately been inaugurated. It is our wish to have friendly intercourse with all similar Associations, and, with this end in view, would be glad to admit your Society as an honorary affiliated member at a nominal subscription of 5*s.* 6*d.* per annum, which sum would admit any or all of your members. The advantages we have to offer, as being in the midst of the most picturesque and charming scenery of England, are, that we shall be able to give advice to those of your members who may wish to visit the Lake District, as to the best field for finding the most interesting views, whether of general lake and mountain scenery, rivers, waterfalls, quaint old cottages, &c., with the use of our Club-rooms free for one week, including books of reference and a well-appointed and safe dark room in which to change plates or develop. We should be glad to hear at as early a date as possible whether you would be willing to join us."

The Hackney Photographic Society's Annual Dinner took place on April 2, among those present being Messrs. J. Traill Taylor, Hay Taylor, Snowden-Ward, E. J. Wall, R. Child Bayley, Fall, Debenham, Welford, Sinclair, Oakden, and Mummery. The President (Dr. Roland Smith) was in the chair. The toast of the evening, "The Society," was ably put up by Mr. Wall. The President responded to the toast, as one who helped in the creation of the Society "in the catacombs" of Morley Hall. Mr. Gardner gave "The Officers," and spoke highly of their services. The Hon. Secretary, in reply, stated he believed they had as much vitality as any Society, and one constant anxiety to the officers was what new ideas could they institute to bring about fresh interest to the members? He was pleased to say that Mr. Wall was the nominee of the Council for the next year's Presidency, and was fully persuaded the choice was a very excellent one. Mr. Grant followed, briefly touching upon the Society's past doings. Mr. Farmer then toasted the visitors, which was suitably responded to by Messrs. Debenham and Fall. Mr. Avent gave "The Press." This brought Mr. Traill Taylor to his feet, and, assisted by Mr. Snowden Ward, suitable response was made. The "Royal" Society could not be omitted, and the Hon. Secretary gave the toast, remarking, such an institution should be in large and grand quarters. Mr. Child Bayley said that was contemplated, and that the "Royal" was on the move. Other toasts as well as songs and recitations diversified the proceedings, which were of an enjoyable character.

The Incandescent Gas Light for Photographic Portraiture.—Mr. W. K. Burton writes to the Editor of the *Japan Mail:* "In your report of the experiments of members of the Photographic Society of Japan in the use of the incandescent gas light for portraiture, you publish my opinion of the light expressed to the audience at Keil's Hall. As printed, this opinion is less favourable than it should be. Doubtless this is my own fault, not that of your reporter, but I should be sorry, more especially after the kindness of Mr. Janni in putting the light at our disposal, that it should appear that I can only faintly praise it as a luminant for photography. I therefore ask you to print here what I intended, and ought, to have said. The success of our experiments with the incandescent gas light for a luminant in portraiture was most marked, although the lights were not specially arranged for photographic work—were, indeed, arranged in a way the reverse of favourable. The lighting was soft, the results indistinguishable from those that would be got in a good studio with 'north light,' and the exposures, though for the most part made with landscape lenses, were moderate. Without going into complete details, I may say that I am confident that, with portrait lenses, very rapid plates, and twenty burners, specially arranged for photography, the exposure would not have to be more than a fraction of a second. It would be too much to express the opinion that the incandescent gas light is better in all respects for photography than the arc electric light, but it possesses certain advantages of its own. The most obvious is, of course, that it is available where gas can be got—electricity not. Another is, that it lends itself better than the arc light to modification of lighting, by altering the grouping of the burners. The incandescent electric light is scarcely worth considering in connexion with photographic portraiture, the actinism is so slight. True, it is possible to get an actinic light by 'forcing' the lamps by increasing electrical pressure, but this is at the cost of their rapid destruction. Finally, I express my opinion of the relative advantages of the incandescent gas light, and of the electric arc light by stating that, were I setting up as a professional photographer, with the intention of doing evening portraiture, the district being one where electricity and gas were equally available, I should find it hard to decide which light to select."

RECENT PATENTS.

PATENTS COMPLETED.

An Improved Postal Wrapper for Photographs and the Like.

No. 6810. Louis Canesi, 366, Old-street, Shoreditch, London. *February* 16, 1895.

The object of this invention is to make a postal wrapper that will prevent photographs and the like contained therein from falling out.

According to this invention I make the wrapper of card, or other suitable material, in the ordinary way, *i.e.*, like the cover of a book, with a gummed flap to secure same; but, inside the said cover, at each of the edges or sides, I fix a flap, made preferably of cloth, so that, when the photographs or the like are placed in said cover or wrapper, the said flaps may be turned over inwards, *i.e.*, over the photographs, so as to prevent them from falling out. I propose to make the said flaps open, that is, like a frame or mount, so that the contents may be seen by the postal officials, so required by the regulations of the Post Office.

Improvements in or connected with Detective and suchlike Cameras.

No. 9361. James Joseph Hicks, 8, Hatton-garden, London. *February* 16, 1895.

The invention relates to that class of photographic cameras which are provided with a "view-finder," and with a level.

Heretofore the view-finder and the level have been two separate and distinct instruments, fixed at different parts of the camera; this arrangement requires the eye of the operator to look first at one instrument and then at the other, thereby involving the liability of faulty pictures, as when, after having found the view in the focussing screen, the operator has to see to the level of the camera, or *vice versâ*, and he will probably, after having adjusted the camera by the one instrument, disarrange such adjustment when adjusting it by the other instrument.

According to my invention, I obviate this inconvenience, by so combining the two instruments that the proper line of sight for the one is also that for the other instrument, thereby enabling the adjustment of the camera by both instruments to be effected by a single line of sight.

For this purpose, instead of constructing the view-finder with the ordinary focussing sceeen, I use, in lieu of the latter, a circular level, having a transparent glass bottom and a plano-concave glass top or cover, occupying the place of the ordinary focussing screen, and having its under or concave side ground; thus, when the operator looks at the level, he is enabled to adjust the camera by means of the air bubble, and by means of the top or cover serving as the focussing screen, without removing his eyes from one part of the instrument to the other, thereby greatly facilitating and expediting his work.

In constructing such combined level and focussing screen a metal body may be employed, having a clear glass bottom and a plano-concave glass top or cover, serving as the focussing screen cemented in position therein; or the chamber of the level may be made entirely of glass, the bottom portion of which is of dish form, and has its rim ground true, whilst the top or cover is cemented to the rim; or the dish-formed bottom part may have a slightly conical mouth, or seat, to receive a suitably shaped top or cover ground to fit therein, or thereon, and cemented in position.

The level may be connected either with the body of the view-finder or with the camera in proper position to act as above described.

Other shaped levels may be employed so long as the air bubble serves to indicate a horizontal plane, and the top or cover thereof serves as the view-finder.

The view-finder is otherwise constructed in any ordinary manner.

Improvements in Stereopticons or Magic Lanterns.

(Communicated from abroad by Edmund Hudson, of Boston, Massachusetts, United States of America, Journalist and Lecturer.)

No. 7136.—Henry Harris Lake, 45, Southampton-buildings, Middlesex. *February* 23, 1895.

This invention has for its object to construct a stereopticon or magic lantern adapted to be operated from a distant point, whereby the views may be successively displayed or projected upon the curtain at the will of the operator.

In accordance with this invention, a series of slides, as they are commonly called, being transparent plates having pictures thereon adapted to be projected upon a curtain, are connected together as a chain, and adapted to be folded one upon the other for compactness, and means are provided for moving the said slides intermittingly, but at the will of the operator, between the focussing lens and light, although the usual condensing lens will be provided and properly located.

A screen is placed in front of the slide which is being displayed, or in front of the usual display opening, and means are provided for moving or operating said screen to expose the slide or uncover the display opening, and thereafter conceal the slide or cover, said display opening while the next slide is being brought into position, said means being also operated at the will of the operator from a distant point.

The means or mechanism employed for moving the slides and for operating the screen are electro-magnetically controlled, a single electro-magnet is employed, the circuit of which may be operated by the lecturer or exhibitor. One way of carrying out my invention consists in providing two spring-actuated trains, one for moving the slides, and the other for operating the screen. The slide-operating train is released by the screen-operating train, and the screen-operating train is released by the electro-magnet, so that said electro-magnet directly or indirectly releases or controls both trains.

The screen-operating train is adapted to so move or operate the screen that it shall cover the display opening and thereafter uncover it, and the slide-operating train is designed to move the slide whenever the display opening is covered by the screen.

The slides each consist of a plate held in position between two side pieces or clips by means of rubber bands or otherwise, said side pieces or clips being loosely connected at the ends to cross bars above and below the plate.

The cross bars and side pieces or clips thus serve as separable frames or holders for the plates, and new plates may thus be readily substituted whenever desired; but, in lieu of the particular construction of separable frame, any other form of frame may be employed.

These frames or holders for the slides are loosely or flexibly connected together in a series or chain by links connected to the cross bars or otherwise, and for compactness said connected slides may be folded one upon or against another.

A quadrangular or many-sided drum is secured to a shaft having its bearings in the side plates or frame of the apparatus, the sides or faces of which are of sufficient width and length to accommodate the slides, and a box or case is supported horizontally adjacent to the top of said drum, which contains the folded chain or series of connected slides, the bottom or floor of said box or case being substantially in a plane with the uppermost side of the drum when said side occupies a horizontal plane.

Upon the corners of the drum or points, where the plane slides meet, projections are formed, adapted to engage the cross bars of the slide frames, so that as said drum is rotated, with the slides in engagement therewith, the said slides will be drawn out of the box or case, and, being loosely connected together, will hang by gravity from the drum before the display opening of the apparatus, which is so located with relation to the drum that, whenever said drum is at rest, one of the slides will be directly in front of the said opening, and, as said drum continues to revolve intermittingly, the slides will pass by said display opening successively, entering another box or case, in which they are folded one upon another.

Secured to the shaft which carries the drum is a stop wheel, having four stop projections corresponding with the four sides of the drum; a lever is provided, having a hooked end, which engages the said stop projections.

The actuating train for the drum consists of toothed wheel connected to a winding shaft, to which the main spring is attached, said wheel engaging a pinion on the shaft, to which shaft is secured a toothed wheel.

A toothed wheel is secured to the shaft carrying the aforesaid stop wheel, which engages the toothed wheel of said spring-actuated train.

Another stop wheel is secured to a shaft having a stop projection, which is engaged by a lever, the lower end of which lever is connected with the armature of an electro-magnet, adapted to be included in an electric circuit, to be operated in any usual or suitable way.

The projection, which is secured to, or formed upon, this second stop wheel during each revolution of said wheel, engages the aforesaid lever, moving it on its pivot to thereby release the first stop wheel.

Thus it will be observed that, by means of the electro-magnet, through the intervention of the second stop wheel, the spring-actuated train for the drum will be released, permitting said drum to rotate one quarter of a revolution, and advancing the slides correspondingly.

A screen is provided for the display opening, and may be suspended from the end of a cord which passes through an eye, thence through other eyes, and connected to a stud on the aforesaid second stop wheel, and at each revolution of said stop wheel it operates to lower, and thereafter raise the screen.

The train for operating the second stop wheel consists of a toothed driving wheel connected with the winding shaft, to which the main spring is connected, said toothed driving wheel engaging a pinion on the shaft which carries the second stop wheel.

A toothed wheel is secured to said shaft carrying the second stop wheel, which engages a pinion on another shaft, to which shaft is secured a toothed wheel, which in turn engages a pinion on a shaft, to which is secured a toothed wheel, which engages a pinion on a shaft carrying a fan escapement.

Whenever the second stop wheel is released and makes one complete revolution, the screen will be lowered and thereafter raised.

Instead of employing a screen adapted to move vertically, it is obvious that it may move in any other way, or by other mechanism than that described.

As a retractile spring for the releasing levers, a coiled spring is interposed between and connected at the ends to said levers.

The apparatus will be provided with any usual or suitable light, and also with any usual or suitable condensing lens, and also with any usual or suitable focussing lens.

In lieu of the particular construction of spring-actuated trains herein described, any other form of train or equivalent motor mechanism adapted to be released or operated from a distant point, as by an electro-magnet, may be employed, which possesses the necessary functions of moving the screen to cover the display opening, and thereafter returning it to its normal position, and during such time operating the slide.

The electrically controlled actuating mechanism for the chain or slides, and screen are applicable to ordinary stereopticons or magic lanterns.

One of the most important uses to which my invention is applicable, and for which it is especially designed, is for lecturers who desire to illustrate their lecture with views of different kinds, and it will be seen that the lecturer may place the apparatus in the hall in proper position for use, and then, while standing upon the platform delivering his lecture, may illustrate the same as he may desire, and that the entire apparatus is under his own control. When he desires to bring the next picture to view, he may simply press an electric button which he may hold in his hand, or he may operate any other form or construction of circuit controlling device to thereby operate the circuit of the electro-magnet which controls the operation of the slide and screen-actuating mechanism.

He thereby avoids the necessity of an assistant, which is now imperative for operating the apparatus.

Improvements in the Manufacture of Photographic Plates.

No. 9270. Otto Magerstedt, 183, Reichenbergerstrasse, Berlin, Germany. *February* 23, 1895.

This invention relates to certain improvements in the production of photographic plates connected with the invention described in my previous Specification, No. 5932, of 1893. In this Specification is described a treatment of plates by which the defects of halation and solarisation are avoided, by placing a coloured layer between the layer of haloid silver emulsion and the material carrying it.

For the production of the said layer, not only colouring matters, such as are mentioned in the Specification No. 5932, of 1893, above referred to, may be used, but also coloured substances, which are not all colouring matters properly speaking, for instance, nitro or nitroso derivatives of amines, phenols, cresols, reorcine, naphthols, or their sulpho or carbo acids.

It has already been tried to avoid solarisation by bathing dry plates in a solution of the ammonia salt of picric acid, but by this method the sensitiveness is so impaired that plates thus prepared completely fail (see Eder, *Jahresbuch für Photographie*, 1894, page 378).

By applying only an intermediate layer, according to my invention, such failure is avoided.

The preparation of the plates with the substances mentioned above is similar to that described in the Specification, No. 5932, of 1893, above referred to.

The claims are:—1. The manufacture of photographic plates, free from the defects of solarisation and halation, by placing between the sensitising haloid silver emulsion and the plate itself a layer coloured with nitro or nitroso products of the amines, phenoles, cresols, resorcine, naphthols, or their sulpho or carbo acids. 2. Photographic plates prepared in the manner above referred to.

Improvements in Film-changing Photographic Cameras.

No. 7450. Joseph Thacher Clarke, 3, College-terrace, Harrow, Middlesex.—*March* 9, 1895.

My invention relates to photographic cameras of that type in which a pack or series of flexible sensitised films, without sheaths or holders, are separated and released, *seriatim*, by means of suitable selecting devices, and are thereupon caused to drop by their own weight so as to form another pack or series. Film-changing cameras of this type, working upon what may be termed the gravity system, were first described by me in Letters Patent, No. 11,891, of 1890, and are now widely known in practice.

Hitherto the released and deposited sheets—that is to say, those films which have been exposed and changed—have been retained in the secondary pack or series, and prevented from falling into the body of the camera, on this being inverted, by means of two devices: the first of these (described in the before-mentioned Letters Patent, No. 11,891, of 1890) being a presser foot which was raised when a sheet was to be deposited, and was afterwards returned to bear upon and retain the series of deposited sheets; the second (described in Letters Patent, No. 9819, of 1892) being a flexible dividing band or septum which intervened between the holder of the primary or unexposed series of films and the pack of released and deposited films, the said septum being carried out of the way of the dropping film through the rotation of the holder, to which one end of it was attached.

The purpose of my present invention is to provide a third and novel means of retaining the pack of released and deposited films. This I effect by constructing upon the top or the bottom of the camera case, or upon one of the sides thereof, a chamber for the reception of the discharged films, but little larger in plan than the films which are to be stored therein, so that these films can shift but little in a lateral direction, the said chamber being provided, along that inner side through which the films are introduced, with narrow border strips or ledges, projecting so far from two or more sides of the receiving chamber that a film, when once forced and bent past these ledges, cannot again fall through them into the body of the camera, even though this be inverted. These ledges, which are situated, as will be readily understood, in a plane parallel to the face of the pack of exposed films stored in the receiving chamber, have between them an aperture slightly smaller than the corresponding dimension of the sheets which are to be pushed through between them, and are thenceforth to be retained by them. The thickness of these ledges is immaterial, provided they be of sufficient rigidity to withstand the thrust of the film which is pushed past them, and to support the pack of deposited films retained behind them. They may be formed as projections perpendicular to the walls of the camera case and parallel to the films in the receiving chamber, or they may be somewhat inclined towards the interior of the chamber, so as to facilitate the bending of the films which are passed between them.

It is plain that a flexible sheet or film, when dropped upon these ledges, must, in order to pass between them, be slightly bent, and the force requisite herefor I preferably apply by means of a stamping-through device or pusher, which is moved aside when a film is to be discharged from the primary series, and is thereafter advanced between and sufficiently past the aforesaid ledges to carry before it the discharged film, which is thus so flexed as to pass the gate formed by the ledges. I do not limit myself to a particular conformation of said pusher, which may be of any shape so long as it is adapted to perform its function in combination with the ledges; but a convenient method is to construct the pusher as a thin board or flap, so hinged or linked to the walls of the camera as to be movable towards and away from the ledged entrance to the receiving chamber. This flap forms, when withdrawn, a slanting division

within the body of the camera, the interior of which thus resembles a hopper, into which the released film drops when the lens end of the camera is pointed downwards, and the selecting and separating devices are operated. The flap advances, when closed, just beyond the aforesaid ledges, between which the film is thus caused to pass and to enter the receiving chamber. Such a pushing device may be operated from the outside of the camera in any convenient manner, as, for instance, by the direct action of a rod passing through a light-tight fitting in the walls of the case. The operating mechanism may be connected with the selecting and separating film-changing devices, so that one and the same movement from the outside of the camera shall first withdraw the pusher, and thereupon separate and drop the foremost film. The motion of that end of the pusher which is nearest to the unexposed films may, by means of a link or double hinge, be made exactly parallel to the front of the primary pack, and this end may be provided with a brush or pad of any suitable material, such as plush, which shall sweep along and dust off the foremost sensitive surface in such wise as to remove therefrom any loose particles which might otherwise prove detrimental to the resulting negative.

When it is desired to compress the pack of deposited films in the receiving chamber, this space may be fitted with a light pressure board, bearing with its spiral spring outwards upon the wall of the camera case, and with its board inwards against the ledges before described, or against the films which have been introduced into the chamber. Such a pressure board will, in the operation of film-changing, be compressed and moved backwards by the thrust of the pusher, until the deposited film has been carried past the ledges. On the pusher being withdrawn, the pressure board will return to hold the secondary pack of exposed films into contact with the ledges.

Access to the receiving chamber through the wall of the camera case may be provided by any of the light-tight slides or hinged doors which are in common usage, or the receiving chamber, together with its ledges, may be constructed as a separate tray, which can be withdrawn through that aperture which gives access to the primary series of unexposed films.

Improvements in Photographic Cameras.

No. 8881. James Gage, 8 and 10, Pembroke-place, Liverpool, Lancashire. *March* 9, 1895.

This invention has for its object a photographic camera which can be made at small cost and sold at a low price. It is designed to carry its own plates and automatically, or almost automatically, change an exposed plate for an unexposed one, so that views can be taken in quick succession. The camera can be carried under the arm, and the image found and focussed, and the exposure is instantly effected without having to alter the position of the focussing glass or screen in any way.

In carrying out my invention, I prefer to make the camera in the form of a box with compartments. The sensitised plates are stored in a sliding or removable store box or magazine in an upper compartment, this magazine being provided with divisions or pockets for containing the sensitised plates. A slit, wide enough for one plate to drop through, is provided in the partition between this upper compartment and the exposure compartment below. To expose a plate, therefore, the magazine is moved slightly forward, so that the plate will drop through into the exposure compartment. After exposure, the camera is turned upside down and the exposed plate drops back through the slot in the magazine. This operation may be repeated as often as there are unused plates in the magazine. The plates that have been exposed, or those that are held in reserve, are both carried in this magazine. In practice, I may employ one or more magazines adapted to fit within the compartment, and each of said magazines may contain a complement of plates. Thus, when the plates in one box are used, it may be withdrawn and another substituted.

The magazine has mechanism for moving it forward, also for locking it in any desired position, and means for indicating the particular plate that has dropped through, thus removing danger of one plate being brought down twice.

I propose that the focussing screen be placed at one end of the exposure chamber, near where the plate is dropped into position. Thus, by holding up the camera at the level of the eye, the image can easily be focussed on the screen, and this image will be about the same size as the picture photographed on the plate. From the foregoing description, it will be readily seen that one great advantage of my camern is that the view may be photographed the moment it is found or focussed. The exposure shutter may be formed of a hinged or rotatable slide, which can easily be moved by the finger.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange rustic arm-chair for exterior background lighted left.—Address, Geo. Moore, Buckfastleigh, Devon.

Will exchange Lancaster's half-plate set, with nine double backs, for whole-plate rapid rectilinear or wide-angle lens.—Address, Mower, Ashton House, Grevill-road, Southville, Bristol.

Wanted good half-plate set portrait lens. Will give in exchange quantity new religious works. List sent approval.—Address, William Armstrong, 157, Askew-road, Gateshead, Durham.

Wanted, studio accessories; will exchange a splendid print-washer, will wash about 500 cabinets. Too large, never been used; new. Particulars by letter.—Address, R. H. Ramsay, Lerwick, N.B.

Will exchange Marion's five-guinea embossing press and four dies for whole-plate portable camera, backs, tripod, printing frames.—Address, M. Fritz, 2, St. Thomas-road, North Heigham, Norwich.

Will exchange grand collie dog, eight months old (parents both winners, sire sold for fifty guineas), full pedigree sent, for half-plate threefold tripod and 8×6 background.—Address, Arthur Shallcross, 32, Grosvenor-street, Leek, Staffordshire.

Will exchange, for cushion safety, complete photographic outfit—half-plate camera (mahogany), with stand and cloth, chemicals, frames, dishes, double dark slides, lamp, and splendid dark room, four feet square, seven feet high.—Address, A. H. Gocher, 3, Station-road, Wood Green.

Wanted, photo-autocopyist and press, half-plate size, or larger, also half or whole-plate camera and three dark slides. Will give in exchange a three-guinea banjo, violin, two bows and case, and a double-barrel breech-loading twelve-bore gun and cartridges.—Address, Harry Ebury, Photographer, Kidderminster.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
15	Leeds Photo. Society	Prize Slides and Members' Lantern Evening.
16	Brixton and Clapham	
16	Derby	
16	Gospel Oak	Developing Competition.
16	Hackney	*Ellan vannin veg veen; our Manx Trip.* L. C. Wilks, J. J. Westcott, and W. F. Fenton-Jones.
16	Hastings and St. Leonards	
16	Munster	*The Application of Photography to Scientific Research.* Dr. Ringrose Atkins.
16	North London	
16	Paisley	
16	Royal Photographic Society	First of the Special Meetings devoted to Photo-mechanical Processes.
17	Brechin	
17	Bury	
17	Croydon Camera Club	Photographic Chat.
17	Leytonstone	
17	Manchester Camera Club	
17	Photographic Club	Hand Cameras up to Date.
17	Southsea..	
18	Camera Club	Discussion on Lantern Matters.—*Lantern Slides.* F. H. Evans.
18	Ealing	*Supplementary Notes on Carbon Process.* A. S. Handford.
18	Glossop Dale	
18	Greenock	
18	Hull	
18	London and Provincial	Paper by A. Haddon.
18	Oldham	
18	Oxford Photo. Society	
18	West London	Social Technical Meeting.
18	Woodford	*The Use of Alpha Paper.* E. Noble.
19	Cardiff	
19	Croydon Microscopical	Technical Evening.
19	Holborn	
19	Leamington	
19	Maidstone	
19	North Kent	
19	Plymouth	*Development of Papers.* W. H. Mayne.
20	Bournemouth	Prize Slides.
20	Hull	
20	Leytonstone	Excursion: St. Saviour's Church, Southwark. Leader, A. E. Bailey.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

April 4,—Mr. R. P. Drage in the chair.

Mr. J. Packham prefaced a demonstration of his method of toning platinum prints with catechu by the following brief description of the method:—"The prints to be operated upon may be those produced by the processes known as the 'hot bath black,' the 'hot bath sepia,' and the 'cold bath black.' The printing-out papers by Pizzighelli and by Hardcastle also give results showing a great affinity for the colouring matters, but in every case, so far as present experiments have gone, although they show a greedy absorption of the tincture, the colours are of a very warm character. In preparing prints for this after-process of toning, every precaution must be taken in protecting the paper from the action of light. Wherever the slightest deposition of platinum takes place, there will be a colouration, more or less intense. By these precautionary measures the high lights are kept brilliant. When using cold-bath black platinotype paper there is a decided advantage in allowing it to be fully acted upon by the atmosphere, either before or after printing—preferably before. It may be stored in a dark drawer or cupboard for one, two, or even several days, which will give the prints an additional power of absorbing the tinctorial matter, but if kept thus for too long a time, especially in a very damp atmosphere, the whites are inclined to become degraded. For hot-bath black and sepia papers it does not appear to be necessary that the papers should be in the condition known as 'stale,' but these papers do appear to have an increased affinity for the colour if they are allowed after development to age before being submitted to the toning bath. Development appears to have a decided effect in governing the after-colour of all kinds of platinum prints treated by this process. *Old baths of the potassium oxalate that have been repeatedly employed give the prints an increased affinity for the colouring matter.* Baths slightly—*i.e.*, very slightly—acidulated with oxalic acid gave colder tones than an absolutely neutral bath, and baths that are decidedly alkaline give warmer tints. The admixture of certain organic sub-

stances, as, for instance, glucose, sugar, and honey, added to the oxalate developer, have the power of increasing the absorptive power of the deposit. A favourite developer of Mr. B. Gay Wilkinson gives excellent results :—

Oxalate of potass.	7 ounces.
Genuine West India sugar	½ ounce.
Water	14 ounces.

Boil all together for five or ten minutes, and develop the cold-bath paper by flotation at 100° up to 120° Fahr. All traces of iron and clearing acid must be well washed out, but it is not absolutely necessary that the prints should be dried, although better results are apparently secured by allowing them to be kept dry for a few days before toning. To prepare the toning bath, take a packet of the prepared compound tinctorial powder, and boil for three or four minutes in five fluid ounces of water, (This is best done in a Florence flask, over a spirit-lamp or Bunsen gas-burner.) When this is cold, add one fluid ounce of methylated spirit. In this form, if well corked, it will keep for a long time. This is the stock solution. To make the bath up for use, take one pint of water, and raise it to a temperature of from 130° to 150° Fahr. Add to this from thirty to forty minims of the above stock solution, immerse the print or prints in this bath, and keep the temperature to this point until they have arrived at the tint required. This method we call the warm-bath method. The toning will be completed in a few minutes. For the cold-bath process the same proportions of concentrated decoction and water are taken. Into this immerse the prints, as usual, turning each hour until completed; they require no further attention. This latter method may take three, four, or five hours, but it is by no means troublesome. For a single print, or for only a few, the hot bath is most convenient; but great care is required at the higher temperature not to injure the prints, for in hot water the paper, after acid treatment, is very tender; and, where large numbers are required to be toned, the cold bath, although taking a somewhat longer time, is recommended. The water being cold, the prints can be handled without fear; almost any number can be done at the same time, but with a quantity the bath must be occasionally renewed, or it will become exhausted, unless there be plenty of the fluid in the dish. Do not allow the bath to become darkened, either in the hot or cold process, or the whites will be degraded; but a slight creaming of the lights adds materially to the harmony of the print. During both the hot and cold process, the bath will gradually become reddish, probably from the formation of rubinic acid, especially if the water employed contains much lime. This may be obviated to some extent by using one or two grains of neutral oleate of sodium in the bath, or one grain of oxalate of potassium to the pint of water, but each will give a somewhat warmer tone to the prints. In working the hot bath, it is advantageous to have a tray of perforated zinc, not quite touching the bottom of a deep developing dish, containing the toning solution. This dish may again be placed upon a sand bath or water bath, in order to maintain the temperature. When the prints are toned to the desired tints, they are to be removed either from the warm or cold bath, and rinsed in one or two changes of water, then dried in the usual way. The finished print is greatly improved by a good rubbing with a dry, soft cloth, or by giving it a thin coating of the special neutral oleate paste. There is, again, a further operation that is most useful where absolutely clear whites are required. You dissolve forty grains of Castile soap powder and eighty grains of bicarbonate of soda in each pint of water at 180° Fahr., and, maintaining this temperature, allow the prints to steep in this liquid for five or ten minutes; the whites will become bleached and the colours intensified. This is not always necessary, as the slight colouration of the high lights frequently harmonises to advantage with the brown tone of the subject."

The demonstration was then proceeded with, some prints being successfully toned. Many specimens treated by the process were also shown.

In reply to various questions, Mr. PACKHAM said the process did not give too much intensity in the shadows. It improved the light semi-tones. As to the permanency of the method, he remarked that the colour of the dark red sails of barges and similar vessels was produced in the same way, and these stood the sea air without changing. A little iron left in a platinum print tended to give a darker result with the catechu solution.

A vote of thanks was passed to Mr. Packham.

PHOTOGRAPHIC CLUB.

APRIL 3,—Mr. J. Nesbit in the chair.

The death of Mr. W. Ackland, a former Trustee of the Club, having been announced, a vote of condolence with the family was passed.

Mr. J. R. GOTZ read an exhaustive paper on *The Examination of Photographic Lenses*, illustrated by numerous diagrammatic lantern slides. This paper will appear next week.

Holborn Camera Club.—April 8, Annual General Meeting, Mr. D. R. Lowe in the chair.—The following officers were elected for the ensuing year :—*President :* Mr. D. R. Lowe.—*Vice-Presidents :* Messrs. Fred Brocas, S. T. Chang, F. Knights.—*Committee :* Messrs. H. J. Cobb, A. Hodges, E. Hodges, H. Thompson,—*Hon. Treasurer :* Mr. Albert Bell.—*Hon. Librarian :* Mr. H. G. Trayfoot.—*Hon. Secretary :* Mr. J. Brittain.—*Assistant Hon. Secretary :* Mr. F. J. Cobb. A vote of thanks was unanimously passed to the retiring Hon. Secretary, Mr. F. J. Cobb.

Lewisham Camera Club.—The Annual General Meeting took place on Friday, the 5th inst., A. H. Miles (Vice-President) in the chair.—The reports of the Secretary and Treasurer gave a very good account of the past year's work. The officers for the ensuing year are as follows :—*President :* Rev. I. Morley Wright.—*Vice-Presidents :* Messrs. C. J. Darling, Q.C., M.P., W. J. Dibdin, F.I.C., F.C.S., A. Haddon, R.N.C., F.P.S., A. H. Miles, M. Stodart, and Professor C. J. Lambert, M.A., F.R.A.S.—*Committee :* Messrs. W. C. Chaffey, C. Churchill, H. L. Davis, B. Davidson, W. L. Gray, and C. Lanchester.—*Hon. Treasurer :* Mr. E. B. Eastwood.—*Hon. Secretaries :* Messrs. E. Eastwood, 47, Tressillian-road, Brockley, and H. M. C. Sprunt, 192, New Cross-road, S.E.

Putney Photographic Society.—April 1, Dr. W. J. Sheppard presided. Lantern Slide Competition.—Among those shown were two of the Oxford and Cambridge boat race, taken by the Hon. Secretary. The next meeting will be held on the 25th inst., when Mr. Eustace Calland will read a paper on *The Camera in the Country.*

South London Photographic Society.—April 1, Sixth Annual Meeting, Mr. H. Goodwin in the chair.—The HON. SECRETARY read the annual report, which showed that the Society had maintained its membership and that the usual bi-monthly meetings had been held continuously throughout the year and well attended. The Annual Exhibition, held for the first time at the Camberwell Public Baths, was favourably commented upon by the photographic press and considered to be a great advance on all previous efforts, special reference being made to the apparatus section. The interest in the excursions had increased, owing to the great energy displayed by the Excursion Secretary (Mr. Slater), and there was evidence at the Exhibition of benefits derived by some of the members through attending the outings. The demand for the loan of lantern slides by members during the year was much greater than heretofore. The demand for the loan of the Society's cameras (12×12 and 8½×6½) had been steadily maintained. A *conversazione* was held in March, and was a great success. During the winter the Committee formulated and adopted a scheme for a photographic survey of South London, which will be pushed during the coming year. The election of officers resulted as follows :—*President :* Mr. F. W. Edwards.—*Vice-Presidents :* Mr. Howell, Dr. Munyard, Messrs. W. Rice and S. W. Gardner.—*Committee :* Messrs. Boyce, Buckle, Dickinson, Fellows, Grigg, Lyon, Miller, Slater, Whitby.—*Delegates to Royal Photographic Society :* Messrs. Edwards and Oakden.—*Curator :* Mr. G. H. Moss.—*Hon. Lanternist :* Mr. J. T. French,—*Hon. Treasurer :* Mr. Mark Boxall.—*Hon. Secretary :* Mr. C. H. Oakden, 30, Henslowe-road, East Dulwich, S.E.—*Hon. Assistant and Excursion Secretary :* Mr. A. E. Allen, 27, Princes-square, Kennington, S.E.

West London Photographic Society.—March 28.—Mr. LESLIE SELBY read a very interesting and instructive paper on *Jottings.* Dealing first with "Why he is a photographer," he stated that he had, like many others, begun, but, unlike most of them, he was determined to continue until he had thoroughly mastered it. Tracing the beginning to THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC some years ago, which was issued with a bromide print as frontispiece, which struck him as so much more artistic than the then universal silver print, he passed on to the negative and development, and, after having tried all the new and old developers, still used the pyro-ammonia, as, though the others gave in many instances prettier negatives, the negative was only a means to the end, and the yellow pyro-ammonia negative generally gave the best prints. At the same time, it was necessary to suit the printing process to the negative, and, if not suitable, it was easy to reproduce the negative, if any particular process was necessary. He generally made a rough proof in matt P.O.P., and then judged whether the subject would be best in platinotype or carbon, strongly recommending the latter as the acme of simplicity. No jottings, however, could be complete without touching on that point of discord, the focus question, and here he showed some prints from the same negatives, the one absolutely sharp, the other printed with a sheet of glass between the negative and paper, leaving the decision to the individual members. A very interesting discussion ensued, some members suggesting that photographs and "fakographs" should be judged separately at all exhibitions.

Bath Photographic Society.—March 27 Mr. Aug. F. Perren (President) in the chair.—Mr. R. A. D. Berrington was elected a member of the Society. The remainder of the evening was devoted to a popular lecture given by Mr. F. O. BYNOE (of R. & J. Beck, Limited), entitled, *The Modern Hand Camera and its Capabilities*, with especial reference to the Frena. The lecturer commenced by briefly describing the advances made in photography in recent years, and the enormous power it gave one in securing a permanent record of passing scenes and events. To learn to sketch from nature, said Mr. Bynoe, was a life's work, to take pictures with a hand camera is a day's pleasure. The fruits of the work of the hand camera heightened their appreciation of the objects met with in a day's trip. He then described in detail the mechanism of the Frena, spoke of the advantages of films in hand-camera work, and the difficulties to be encountered by those bent on inventing new forms of apparatus. By means of limelight diagrams the internal mechanism of the Frena was shown, and by drawings on the blackboard the efficacy of a swing back was made clear, and optical conditions necessary to success was popularly demonstrated. The theory of fixed focus lenses, and adjustable magnifiers was also treated. During the lecture, which lasted one hour and a half, a large number of excellent views were shown, embracing every class of subject from the summit of a glacier to the bottom of a coal mine. Views at home and remote all tended to emphasise the power a good hand camera is capable of conferring upon the user.

Liverpool Amateur Photographic Association.—March 30.—Notwithstanding the unpromising appearance of the weather, a party of upwards of twenty met at the landing-stage, and proceeded by train to Bromborough. Here, after a few minutes' detention by a shower, the only one of the afternoon, cameras were unpacked and work commenced, many choice little pictures being obtained in the lanes and about the old ponds, with their overhanging gnarled and twisted oaks. The party proceeded through Dibbinsdale to Raby Mere, where an admirable tea was served at the Mill House. The return was made from Bromborough, and the landing-stage was reached shortly before eight, after a very successful day.

Nottingham Mechanics' Institution Camera Club.—April 1, the chair was occupied by Mr. T. K. Gordon.—The Hon. Secretary read an interesting and instructive paper on *Developing, Intensifying, and Reducing Negatives.* Afterwards transparencies of various exposures were successfully developed and also some prints on "Nikko" paper. Methods of intensification and reduction were practically demonstrated, and numerous technical questions were answered by the Hon. Secretary. A vote of thanks was accorded to Mr.

Edgar for the trouble he had taken in preparing his excellent paper and giving the demonstration.

Rotherham Photographic Society.—April 2, Mr. E. Isle Hubbard M.S.A., presided.—Excursions for the coming season were fixed as follows:—May, Haddon Hall, Derbyshire; June, Ingleton; July, Roche Abbey; August, Conisborough and Sprotborough. One new member was elected. Mr. J. Leadbeater afterwards successfully demonstrated the working of "Presto" and "Otto" papers, Mr. Otto Scholzig having kindly sent finished and unfinished prints, as well as samples for distribution.

Photographic Society of Japan.—The tempestuous weather of Friday evening, February 15, greatly thinned the gathering at the Photographic Society's Lantern meeting held in the Masonic Temple. It was matter for regret, for the slides shown were of high merit, worthily sustaining the standard set in previous exhibitions of this kind. First of all was shown a negative taken that day by the incandescent light, an illuminant which Professor Burton thought not quite so effective for photographic purposes as the electric light, but still of such a character as to produce good results. The selection of slides illustrating Japanese customs, trades, manners, and people, to be sent to the American Lantern Society, were next exhibited, after which Dr. Wood described some slides which had been made from negatives taken in the Hokkaido the previous summer. After an interval, a splendid collection of views on, of, and around Fuji were shown, in the course of which Professor Burton described the ice caves which he had stumbled across, as it were, in the course of a survey upon the lower slopes of the famous mountain. He propounded the theory that these marvellous caves had been formed through an accumulation of immense snow-drifts which had been overwhelmed by a huge mass of scoriæ during some far-back disturbance of the volcano; and this snow had gradually turned to ice, first by heat and then through compression. The learned Professor arrived at this conclusion upon noticing that the ice of the caves was stratified, a condition not attendant upon glacial formations. A curious thing in connexion with these caves is that a long, narrow tunnel, never yet thoroughly traversed, leads from the far end, and through this tunnel rushes a blast of air sufficient to extinguish a torch. Professor Burton advises a trip from Yokohama to the neighbourhood of these caves, claiming that the scenery to be passed through on the way to them is unsurpassed for grandeur and beauty in the whole of Japan.

FORTHCOMING EXHIBITIONS.

1895.	
April 15, 16.....	*Beverley. T. J. Morley and A. W. Pickering, Toll Gavel, Beverley.
,, 30–May 4	*Eastbourne. J. J. Hollway, 11, Hyde-gardens, Eastbourne.
May 6–11.....	*Birmingham. C. J. Fowler, 2, High-street, Birmingham.
June 29–July 6	*Agricultural Hall. W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE FENCHURCH-STREET EXPLOSION.

To the EDITOR.

SIR,—In common I expect with most other readers, I looked with a good deal of interest for what might be said in the April LANTERN RECORD about the above explosion, but I was not prepared, I must confess, for the inconsequential "funk" which seems to have come over some writers on the subject. Let us quietly examine the position. During the history of high-pressure cylinders, there have been to my recollection only three serious accidents arising from their use. The first was the explosion of a cylinder known to be charged with mixed gases for experimental purposes; the second (at Bradford) was a fracture, and bursting caused by the fall of a cylinder proved to have been of improper material; the third (at Fenchurch-street) was an explosion caused in some way, as was evident to all readers, and confirmed by the evidence of Dr. Dupré, by the presence of an explosive mixture of some kind where there should only have been pure oxygen.

If, now, this record be compared with the chapter of accidents which have occurred in connexion with the home manufacture of oxygen and with the use of bags, it will be seen that, on the whole, the new system, particularly when its enormous extension is taken into account, is as much ahead of the old in point of safety as the railway is safer than the stage coach. But in dealing with the accidents referred to, we must take out the second as being due to a cause which experience has now eliminated, and we then find that, given properly made cylinders, charged with pure oxygen only, the accidents have been absolutely *nil*. This is of the utmost importance. I do not overlook the accident which so nearly deprived the photographic world of Mr. F. A. Bridge's valuable services, but I remember that it was not a cylinder, but a pressure gauge which went "off" in that case.

In order to meet the so-called danger, two suggestions appear to come to the front. Firstly, Mr. Chadwick's, "Make your own gas." All very well, Mr. Chadwick, if you do not need to carry it about with you, although not even then without its dangers, as the story of so experienced a man as the unfortunate Mr. Wrench would show. But we have to carry our gas from place to place, and I think none of us who remember the old days wish to go back to the trouble and risks then involved. Secondly, we are told by a chorus of writers, Reduce the pressures. Why? Experience and exhaustive tests have shown that a proper cylinder is perfectly safe under the usual pressure, the margin of safety being very large, and the conditions of testing and charging keeping up a continual check upon the safety, while nothing whatever would be gained in the case of an explosive mixture, which would be every whit as dangerous under an initial pressure of ninety atmospheres as of 120. If the contents take fire and explode, the cylinder will become a bursting shell in any case, while a reduction of charging pressure below that for which the cylinders are designed, constructed, and tested, will only mean a considerable increase of cost in the repeated journeys involved.

I hope that the principal oxygen compressors will stand to their position, and that, while regulations may be required which shall ensure the quality of cylinders, the purity of their contents (the most important question), and the impossibility of over-charging, such a united front may be shown and such a confidence exhibited, both by the oxygen companies and all their customers whose knowledge and experience qualify them to judge dispassionately, as may reassure the public, and prevent both unreasoning panic and the curtailment of the usefulness of the optical lantern.—I am, yours, &c., WM. BISHOP.

To the EDITOR.

SIR,—Readers of THE BRITISH JOURNAL OF PHOTOGRAPHY will, I doubt not, thank Mr. Chadwick for his communication in last week's SUPPLEMENT, being alike safe and practical. I have myself adopted in time past a very similar arrangement for storage and use of oxygen with success, viz., a gasometer, and such a plan was in use at the Polytechnic in its palmy days; for safety, therefore, we may not outstrip that. I beg, sir, if you should esteem this idea of any use, to suggest to holders of present-day gas cylinders, that they (the cylinders) be first covered with a roll or bandage, or case of *felt*, and over that a *copper* cylinder; this last would, I believe, materially lessen the dangers of the explosion arising from the force of steel splinters when driven off by concussion.—I am, sir yours, &c., C. SWAIN.

Luton.

THE SALON AND EXHIBITIONS.

To the EDITOR.

SIR,—Mr. H. P. Robinson's reply, in THE BRITISH JOURNAL OF PHOTOGRAPHY of March 8, to my letter criticising the method of accepting or rejecting photographs for the Salon Exhibition scarcely met the objections raised by merely saying that it is not a competition.

In that letter I used the term "competitive selection," for the fact that works submitted are judged for acceptance by the Committee renders it practically a competition, or, at least, the same principles that should govern any ordinary competition or the awarding of medals or position at exhibitions, should equally apply to such a selection.

Mr. Robinson says that a preponderance of the works of the members of the "Linked Ring" is easily explained, as they are all enthusiastic in the cause, and nearly all produce work specially for their own Exhibition; but he must allow that the "Ring" possesses the monopoly neither of enthusiasm nor of skill. There are many other ardent workers who are equally working through the year for a result that may deserve a place of honour among the gems of the Royal and other leading Exhibitions; but at the "Salon" the decision as to whether they or their competitors have been the more successful in realising their ideal rests with the members of the "Ring" as a whole, and it is not surprising that they decide in their own favour. He adds that the "Links" "do not claim their space as a right, but submit their works to judgment. *Whose judgment?* THEIR OWN!

The Salon is nominally an open exhibition, but practically it exists mainly for the benefit of the members of the ring; non-members are made to feel that they are outsiders by the treatment that they receive. I cordially concede to Mr. Robinson and the other members the desire to be fair and impartial, but there are circumstances under which it is practically impossible to give an unprejudiced decision.

Mr. Robinson contends that my letter implies that very little of the work of a society should be done by its members—certainly not the selecting, judging, or hanging of pictures—and he asks to be referred to an exhibition of pictures where members send for outsiders to do their work. I have never yet heard of an exhibition where the selecting, hanging, and

judging, and consequently awarding medals, if such are offered, were carried out by the members of the society as a whole, and who still claimed that, in spite of such, a glaring anomaly, they were exhibiting and competing on equal terms with non-members. Such a peculiar contention is reserved for the Linked Ring. At most societies' exhibitions, the works are judged by two or three distinguished outsiders, whose names are a sufficient guarantee of their fitness for the difficult task to warrant even the leading workers entering the competition.

At the Royal, or any society that is strong enough, one or more of the Judges are elected from its own ranks, but these Judges never compete in any way; if they did, it would be useless to urge, as Mr. Robinson does in regard to the Salon Committee, that each man retires while his own works are under review: the impression produced by their action would be very unfavourable.

Four or five Judges can be allowed to exhibit their pictures practically as a matter of right, especially if they are men whose work is eagerly looked for each year; but if the same principle were extended to a committee of forty, the result is such as can be seen in the Salon catalogues.

In the postscript to his letter, Mr. Robinson points out that I have no reason to complain of the treatment of my own works by the Linked Ring, and kindly expresses a wish for my future success. Had my letter been a personal complaint, any force that its criticism might otherwise have would have been thereby nullified. It was intended as an expression of the principle that ought to be the basis of every competition or selection in which decisions have to be given between rival works, and that is that those responsible cannot be too careful to eliminate from the conditions and incidences of judging every circumstance that might create any suspicion of prejudice or personal feeling influencing a decision or award.

From the subject of the Salon to that of Exhibitions in general is an easy transition, and I thoroughly endorse the Hon. Slingsby Bethell's letter in your last issue, excepting its concluding three lines. I should like to add the opinion, however, that Exhibitions are becoming far too numerous, and that, by their number and frequency, are failing in that object that should be the sole aim of their existence. Their object should be to bring together as good a collection as possible of photographs by the best workers, not only to show the art-loving section of the public what is being done to justify the claims put forward by photography to be regarded as a fine art, but also as a means of instruction and comparison amongst the exhibitors themselves, and the photographers of the districts in which they are held.

There can be no means of education more effectual than a comparison of one's own work with that of others; the result must be an incentive to greater efforts. It is reasonable in country districts, where the majority of the members of the local society, and also the residents generally, cannot visit the large exhibitions, to hold one of their own; but in London it certainly seems open to serious objection that there should be so many open exhibitions, and especially so when several are held in the same month—it is impossible that the standard can be high. If the majority of local societies restricted their efforts to an exhibition of the members' work only, it would ensure that a few open competitions would receive contributions from almost every leading worker, and the average quality would be far higher than under the present conditions. It is unreasonable to expect those who practise photography purely for the love of the art to send to three or four exhibitions at the same time.

That medals are harmless is surely open to question. The value of an award is determined by the standard of the exhibition in which it is won and the number of awards made: a medal is a positive evil if given for indifferent work, an even for a fairly good picture competing against decidedly inferior; but, on the other hand, it is an honourable distinction if the standard of work is high, and one that, even to the most enthusiastic photographer, is an additional inducement to strive to excel.—I am, yours, &c.,

HENRY W. BENNETT.

A HARD CASE.

To the EDITOR.

SIR,—I read with indignation, as I dare say every one else did who perused that letter entitled "A Hard Case," which appeared in last week's BRITISH JOURNAL. If it is all true as stated, which I for one do not doubt for the minute, then, I can only reiterate and say it is a hard case indeed.

Having been with fairly reasonable firms myself, I can sympathise with those whose misfortune it is to get with such nigger-driving people.

It is a source of wonder to me that the circumstance remained unknown so long as it did; but now the "murder's out," or nearly so, all that we require is the name of "so celebrated" a firm; and then perhaps we should be more enlightened, and be able to avoid that which others have been let in for.

I have often thought what would be the best remedy for a case of this description which, I am sorry to say, does not stand alone in this respect.

The only practical remedy I can think of would be a Photographer's Assistants' Union, which would include all those who assist in any branch of the profession.

These are the outlines of the plan. There would be a branch of the Union in every county, and a head or centre depot in all the great cities of the United Kingdom where matters of this kind could be thrashed out and such wrongs righted.

Hoping to hear other views on this question, and thanking you in anticipation,—I am, yours, &c.,

AN ASSISTANT.

PLAGIARISM.

To the EDITOR.

SIR,—The practice of "brain-sucking," and the wholesale appropriation of the result without acknowledgment has much increased of late, and, in the absence of any remedial measure, the only course open seems to be a public protest from each victim.

The latest example affects myself, and will be found in a paper in this month's *Scraps*, and reproduced in your current issue. The writer of that paper was obviously inspired by my little book *Snap-shot Photography*, the readers of which will so readily recognise the almost *verbatim* quotations therefrom, that it is needless to particularise.

It may be highly gratifying to find your experience and method of working approved and adopted by others; but, when this is done in the manner indicated, I believe it is generally styled plagiarism.—I am, yours, &c,

MARTIN J. HARDING.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

J. A. BAXTER.—Mr. Nash's address is Glengall Lawn, Cheltenham.

T. H. S.—Obtain by preference the one working at *f*·5·6. It is the quickest on your list.

W. H. D.—For general work No. 2 will prove very useful. We cannot yet speak of No. 1 from experience.

P.—Pyroxyline suitable for making negative collodion may be obtained from Messrs. Rouch & Co., Hopkins & Williams, and other manufacturing chemists.

LENS (Manchester).—It happens that we have examples of both, and one is as good as the other; but the 15×12 lens would be preferable to either for outside groups.

T. H. R.—Some makes of films keep very well, but that is not the case with all. Experience tends to show that the better the celluloid is seasoned the longer the films will remain good upon it.

R. H. (Bucks.)—The resin enclosed is not mastic, but a good sample of sandarac. Of course, it would not answer the same as mastic for the purpose you require it. Sandarac *is*, however, soluble in alcohol.

C. C. C.—If the changing arrangement has got out of order, the camera should be sent to the makers, but whether they should repair it free of charge we can offer no opinion. All things are liable to get out of order by continual use.

TRIPOD says: "I see in an article by J. A. Hodges a tripod called 'Sciopticon Manx' stands, strongly recommended. Will you kindly inform me whence I can learn particulars of same?"—Apply to Mrs. Smith, 10, Highbury-quadrant, N.

CALICO.—We know nothing of any process such as you describe, therefore can give no information upon it. There is no work published on the subject so far as we are aware. Some of the works dealing with textile fabrics or calico-printing might give you some information.

W. W. W. says: "Will you kindly inform me which is the best process for the making of enlarged negatives? Up to now I have used carbon transparencies enlarged to wet collodion, but the wet process is both fickle and dirty."—Better use gelatine plates if you do not like wet collodion.

J. HENDERSON says: "When are you going to give us more particulars of Chandor's incandescer? Have the New Incandescent Light Company, of Bucklersbury, put them on the market yet? Your article on October 5 last interested us."—So far as we are aware, no further particulars have been published.

B. FOSTER.—The addition of chrome alum to gelatine will cause it to become insoluble after the film has become dry. Although the gelatine will not dissolve in warm water, it will still absorb it and become softened; indeed, it is analogous to tanned leather. That cannot be dissolved, but it absorbs water and becomes soft and pliable.

J. YOUNG asks how artists prepare the surface of an enlargement for black and white, before starting to work upon it.—It depends upon the surface of the paper and the process by which the enlargement is made. As a rule no preparation at all is necessary; but, if the paper is at all greasy, a slight wash of ox-gall diluted may be given.

G. A. BROADFOOT says: "I have charge of a collection of photographs which belong to an influential gentleman. He has travelled in Italy, Switzerland, France, and Germany, and wishes to add to his collection. Can you tell me if there is any firm in London which deals in Continental photographs?"—In reply: Communicate with Mr. Spooner, Strand, London.

T. A. GRUT.—Your query is one that should be submitted to a solicitor well versed in copyright law. Of course, if any one has, without your consent, made one of your pictures copyright, it will not prevent your selling it. As we have just said, you should put the matter before a solicitor who makes a speciality of the law of copyright. He may possibly be able to obtain you substantial redress.

G. RICHARD says:—"I shall be very thankful to you if you would kindly tell me the composition of Abney's formula (ferrous citro-oxalate) for collodio-chloride for transparencies, quoted in the paper read at the meeting of the London and Provincial Association by Mr. Teape."—In reply: Three formulæ are given; the following is probably meant:—(1.) Potassium citrate, 700 grains; potassium oxalate, 200 grains; water, 3½ ounces. (2.) Ferrous sulphate, 300 grains; water, 3½ ounces. Mix the solutions in equal proportions.

S. ROSE.—The collodion, formula for which is given in the Pharmacopœia, is not well adapted for the wet-collodion process. The pyroxyline used for it is not the kind that is suited for photographic purposes. Instead of trying to make your own collodion, as a beginner in the wet-plate process, we should advise you to purchase it ready for use. A suitable material will then be ensured. If you can get a few lessons from one *au fait* with the process it may prove money well expended, as, from your letter, you seem to be groping very much in the dark.

FERRIC OXALATE says: "1. Referring to formula given in your penultimate issue for preparation of ferric oxalate, whilst all the quantities are given in French measures, sodium carbonate appears as eighty-four *grains*. I presume this should read *grammes*? 2. Can you please give method of preparing potassic chloro-platinite $2KCL\ Pt.\ Cl_2$."—In reply: 1. Yes. 2. See either Pizzighelli and Hubl's book on *Platinotype* or Abney's *Instructions* 1888 edition. The process is somewhat intricate, and requires a lengthier description than we can afford to give.

PHOTOGRAVURE.—Copper plates, polished ready for use, are supplied by all the large dealers in printers' and engravers' materials. But they are not supplied commercially with the surface ready grained with bitumen. Notwithstanding that "the dust box and the powder is a messy and troublesome nuisance to an amateur," we are afraid you will have to put up with it (if you wish to experiment with photogravure) and grain your own plates. Collotype plates, too, are not supplied "ready-sensitised for use." They will only keep good for a day or two, hence they must be prepared as required by the user.

ACETATE asks: "How is it that an acetate bath of 1 ounce of acetate of soda to 100 of water, with 30 grains of carbonate of soda, should give mealy prints after the third or fourth time of using, and have to be thrown away on this account? An acetate bath is generally supposed to improve with age."—We presume that our correspondent adds gold to the solution, but he does not say so or when. If it is made at the time of using, then mealy results must be expected. The gold should be added the day before the bath is used. The acetate bath may be used many times, with, of course, additions of gold, provided it is not contaminated by previous operations.

F. F. (London) says:—"I shall esteem it a favour if you will kindly inform me of the reason in negatives turning yellow after fixation. There is no fogging either in dark-slide room or camera. Both old and new stock plates are attacked. I may add that the pyro-soda sulphite developer is used also—one given by the Britannia Company for their plates. New fixing is used daily, and dishes kept clean; it is only since the frost came that I have noticed the tinting."—Imperfect fixation is the cause. Plates fix much more slowly when the temperature is low than when it is higher. Allow the plates a longer time, and do not consider the plates fixed until they have remained in the solution as long after the last trace of the bromide has disappeared as was taken for its removal.

J. E. ELLAM asks: "Can you tell me the cause of the fog on one edge of the film I enclose? I send a print also which may possibly help you (No. 1). You will see that on print No. 2 it is on the opposite side of film. It is not the fault of the films (which are Fitch's), as I get just the same results on plates. I use a pair of Wray's special hand-camera lenses, 5-in. focus from shutter behind lenses, I remove division and expand full size (½-plate), and result all right, so the camera is light-tight. If you can help me I shall be much obliged."—Without examining the apparatus we cannot say definitely the cause of the trouble. But it seems to us to arise from some reflection in camera or from the lenses. Remove the focussing screen, plant the camera at an open window, and with the head and camera well covered with the focussing cloth, carefully examine the interior of camera, when, no doubt, the cause of the trouble will be discovered.

HANLEY (Staffs.) says: "1. I have what was supposed a very good bar burnisher. Cost 30*s*. The bar seems good steel, has a good ring when sounded, but it always scratches prints. Is it for want of hardening, or, if hardened, would it become soft through heating at a lower temperature for using? 2. I should feel much obliged also could you give me a hint as to copying an illustration on a copper plate, such as is required by copper-plate engravers. Any information I shall esteem a great favour."—1. The bar has become scratched, and requires to be repolished. That may be done with an oilstone worked longitudinally. Although the constantly heating of the bar has some effect, it is not of much importance with a good machine. The price quoted is very low unless the burnisher is of small size. 2. Any good work on engraving or etching will give the methods employed by engravers for transferring designs to metal. It does not come within our province.

W. N.—Our correspondent, referring to a reply recently given to a query as to the sp. gr. of a ten per cent. solution of ·880 ammonia, and in reply to which we referred him to a table given in last volume (page 565), says: "I fail to see how you make it ·960, for, if ·880 ammonia contains 315·2 grammes HN_3 per litre, a ten per cent solution will, I presume, contain 31·52 grammes per litre, in which case, by the table, the sp. gr. would be just over ·986."—In reply, we append a brief extract from Griffin's table, exhibiting the relation between the sp. gr. of liquid ammonia and the percentage strength, the strongest in the table being ·875 sp. gr., and containing 34·664 per cent. of pure ammonia by weight, at 62° Fahr. The nearest to a ten per cent. solution there given are respectively 9·790 and 10·119, the sp. gr. of these respectively being ·96125 and ·96000. "From a footnote in Cooley we quote: "The strongest solution of ammonia which it is possible to prepare at 62° Fahr. has the sp. gr. ·87500, and contains 34·694 of pure ammonia by weight, or 21·251 grammes per gallon."

T. ROGERS asks: "Which size plate, quarter or half, is easiest to develop—I mean, in which plate is the progress of development best seen? I have a hand camera, quarter-plate, and use Ilford 'Iso.' plates, and develop them in a deep ruby light; but I cannot see the progress of development as I should like, so I have to guess a great deal, and get a variety of negatives—some too dense, others too thin, and so on. I am thinking of getting a half-plate hand camera, as, being a larger plate, I could watch the development better, and get negatives uniform in density, &c. Is half-plate suitable for instantaneous exposures (as the general size for hand camera seems to be quarter-plate), or should I use ordinary plates, and develop them in yellow light?"—The process of development is as easily watched on a quarter-plate as on a half-plate, except that the image is on a larger scale with the latter size. If ordinary plates be used, instead of orthochromatic ones, a stronger and less red light may be used, and with that the progress of development can be the more easily watched. Instantaneous can be made on half-plates as well as on quarter-plates.

MESSRS. L. TRAPP & Co., of 1, Budge-row, E.C., write: "We should be obliged if you would kindly notify that our office and warehouse will be closed from Thursday night, April 11, until Tuesday morning, April 16."

AMONG the printing surface novelties Messrs. Wellington & Ward, of Elstree, are introducing is a "toned" bromide paper, results upon which have a charming "old engraving" like effect. This paper will, no doubt, be immensely popular.

WHY should not more attention be given to collotype? There appears to be work enough and to spare for collotypists at present, and we heard recently of an order for half a million collotype prints which appeared to be going a-begging for want of some firm to take it up, all the likely firms being too busy. The reason, no doubt, that comparatively few go in for collotype in proportion to those who go in for photo-engraving is that to do any good in collotype a power machine is a necessity, and this in itself runs into much more than the cost of an entire photo-engraving establishment on a considerable scale. Lithographers, who are generally bewailing present bad times, might very well turn their attention to collotype, which is a line which would fit in very well with their existing arrangements.—*Process Work.*

CONTENTS.

	Page
CLOUD-CATCHING	225
CAUSTIC ALKALIES *VERSUS* CARBONATES	226
JOTTINGS. By COSMOS	228
ARRANGEMENT FOR DRAWING OFF SMALL QUANTITIES OF DEVELOPERS. By WILSON NOBLE	229
ON THE CORRECT RENDERING OF COLOUR VALUES. By HALL EDWARDS, L.R.C.P.	230
CAMERA CLUB CONFERENCE	231
THE GAS CYLINDER EXPLOSION	23
SEASONABLE NOVELTIES	232
OUR EDITORIAL TABLE	233
NEWS AND NOTES	233
RECENT PATENTS	234
EXCHANGE COLUMN	236
MEETINGS OF SOCIETIES	236
FORTHCOMING EXHIBITIONS	238
CORRESPONDENCE	238
ANSWERS TO CORRESPONDENTS	23

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FOREGROUNDS WITH LENSES OF FLAT FIELD.

Since writing on a cognate topic on page 1 of this volume, we have heard a theoretical objection urged against those lenses of Continental make in which the field is flat. If this absolute flatness exist, what, it is asked, becomes of the foreground of the landscape made by such a lens? This implied objection, it is evident, could only be made by those whose experience in the use of a variety of objectives has stopped short at including in the curriculum those corrected by the use of the new glass now being made in Jena—the one town in the world in which glass, possessing those special characteristics which distinguish the manufactures of that place, is systematically made.

Truly does the mental action of these "antediluvians" of our own period form a subject for careful and interesting study. On the one hand we have intelligent, skilful opticians straining every nerve, as it were, to give us lenses which are as near theoretical and practical perfection as can reasonably be desired, and, on the other hand, photographers of the sour-grape school, who, now that their aspirations have been realised, profess to decry, and for a fancied—not a real—objection, that for which they have so long craved. It is prejudice begotten of ignorance. We will endeavour to show on what a sandy foundation their structure is erected.

Now, then, for this sharpness of foreground that is to be no more attainable, on account of the superior flatness of the field given by the new lenses. In the former article, already referred to, we said that penetration or, in other words, depth of focus or of definition did not depend upon the nature of the lens, but upon the stopping of it down to a sufficient extent, and that, in the case of one which with full aperture would not carry its central sharpness to the margin, a lens of rather long focus being presupposed, the mere act of making use of a stop in order to obtain the requisite depth would simultaneously ensure both this property and the marginal sharpening. We are not now speaking of any theoretical matter, but one of fact, and known to every intelligent user of a lens. The more it is stopped down, the nearer to the point of sight does the foreground become sharp. The theoretical focus remains where it was, that is, if the lens is aplanatic; but the practical sharpening of objects much nearer than that focus is increased, and it is this practical advantage with which photographers have to do.

We have proved by actual experiment that, no matter what the focus of the lens may be, foreground objects, much too lose to the camera to be tolerated in a picture with any artistic pretensions, may be rendered with the greatest conceivable sharpness if, bearing in mind the law of conjugate focus, the simple expedient be resorted to of swinging the top of the ground glass a little backwards. This, when the horizon of the view is near to the middle of the picture image, permits of a photograph uniformly sharp all over being obtained, even when the lens is employed with its full aperture. The foreground objects, being nearer to the camera than the distance, have their conjugate foci increasingly farther from the lens, and the swinging backwards of the upper portion of the ground-glass focussing screen fulfils the requirement of conjugate focus in a very perfect manner. It does this with any kind of lens, but with the new lenses of Jena glass (which we here assume to have an absolutely flat field) it does so in a much more perfect manner than with the others. The marginal astigmatism being annihilated, the foreground definition is necessarily far more perfect than could be secured by any lens in which any astigmatism was left uncorrected, and this too with a much larger aperture than with others, for the round or, more accurately, the hollow field of these others demands their being stopped well down in order to make the horizontal plane quite sharp, the sides as well as the centre. The advantage gained by the use of the more perfect objective is twofold, greater critical sharpness of the foreground objects and the attainment of this with a large aperture.

All this might have readily been deduced from theoretical considerations; but, having had the use of an anastigmat for the purpose of experiment, we have subjected it to a trial of the following nature: It was focussed on a row of brick houses a few hundred yards away. This represented the distance. The foreground was prepared for the experiment by placing a row of low-potted plants on the ground, about four yards from the camera. The lens was used with its full aperture. In the negative which resulted both the brick houses and the foreground shrubs were sharp in an exceeding degree, the latter bearing examination by a magnifying glass of great power. The trial was repeated, this time with a lens of similar focus, but of the ordinary time-honoured class. In this case the negative obtained was inferior to the other, and not until a small diaphragm had been inserted into the lens could the definition of the foreground shrubs be rendered as evenly from side to side of the plate as with the other.

From what has been said it will be seen that there is nothing to prevent a sharp and even near foreground from being taken with one of the new lenses of Jena glass and corrected for an absolutely flat field.

COMMERCIAL COLLOTYPE.

A PARAGRAPH we inserted in our last issue—an extract from *Process Work*—is one that must not be allowed to pass without comment, inasmuch as it might tend to alienate still further from the photographic business a process that is more within the province of the photographer than perhaps any other of the processes of mechanical printing, namely, collotype. We have always lamented that professional photographers, as a body, have given so little attention, commercially, to photo-mechanical work, and have allowed it to drift into the channels of other businesses, although the chief part of the work is purely photographic. It matters not which of the mechanical processes we may take as an example, the initial work is a suitable negative which can only be produced by a skilful photographer. The next and succeeding operations up to the time the impressions are taken in the printing press are strictly within the department of photography. Yet how comparatively few photographers have taken up any of the mechanical processes and are working them to any extent, or on the scale that alien businesses are doing. This is to be regretted, because for some years past, indeed while the mechanical processes have been making such rapid strides, photography, as hitherto followed by professional photographers, has been at an exceedingly low ebb.

The paragraph referred to asks why more attention is not given to collotype, and, suggests that lithographers, who are now complaining of bad trade, should turn their attention to collotype, and says there is enough work and to spare for collotypists at the present time. It also mentions that a large order for collotype prints appeared "to be going a-begging for want of some firm to take it up, all the likely firms being too busy." Now, we know there are some large establishments that would be exceedingly glad to accept orders, however large, just now, but not at the price that those who would give them are prepared to pay. Orders "at a price" are continually going a-begging in all businesses; therefore in that respect collotype is no exception, or ever was. We happen to know that some houses have presses standing idle who would gladly undertake orders, however large or small, provided the prices prepared to be paid were remunerative.

Of late years the price for collotype has been cut down lower and lower, and with the usual result, the quality of the work has suffered. At the present time the price expected to be given by some who require them is not remunerative if a high standard of excellence is to be maintained, and, as a consequence, much very inferior work is now being produced, and it is fast bringing this beautiful process into ill repute. Collotype has, during the last two or three years, had a formidable opponent, both as regards quality and price, in the half-tone block process. Year by year this process has been rapidly improving in its results; but the same cannot be said with the collotype produced in this country; indeed, it may be rightly said that, while the half-tone block process has been advancing, collotype, as worked commercially, has been, as a rule, degenerating.

In the extract referred to it is stated, as a reason why so "comparatively few go in for collotype in proportion to those who go in for photo-engraving, that to do any good in collotype a power machine is a necessity, and this in itself runs into much more than the cost of an entire photo-engraving establishment on a considerable scale." Now, it is the introduction of power machines that has tended so much to degrade the quality of commercial collotype printing. In saying this, let it be distinctly understood that we are not for a moment suggesting that as good work cannot be done by a power machine as with a hand press, for it can be produced quite as good, if not even better; but, as in the case of the hand press, if the highest class work is required, it cannot be done at the speed and the low prices that some houses now turn out collotypes.

In principle and in construction a collotype machine is very similar to a lithographic machine, but the printing surfaces are widely different. The soft gelatine film is not the same as a lithographic stone, and it cannot be dealt with in the same way, or impressions produced from it at the same rate as from the stone. The collotype plate requires constant watching by a skilled attendant as the impressions come off, and the press has to be stopped every now and again for the film to be moistened and then dried off; and, unless this attention is carefully bestowed, and the necessary time afforded for it, the prints will be irregular and faulty. That, of course, takes up much time—so does starting a new plate; hence the press is rarely stopped so frequently as it should be for the necessary treating of the film, and plates are often worked long after they are worn out for the best results. Our attention was recently called to an order that had been executed of several subjects by a house of good repute. The prints were, to the eye of an expert, irregular to a degree. Not more than twenty-five per cent. of them were equal to the proof prints submitted, and not more than twenty-five per cent. of the remainder were passable. The remainder were rejected by the customer for whom they were done. But it must be admitted that the price charged could not have been remunerative had the quality of the proof prints been maintained throughout.

That the highest-class collotypes can be produced by power machines is beyond question, and we have in our possession some of the finest collotypes we have ever seen, that were made, from very trying subjects, in our presence, on the Continent some little while ago; but, then, the machines were worked slowly, and were closely watched by a careful overlooker, and were stopped frequently for the plate to be treated by skilled attendants. In some cases the prints were caused to pass through the machine two or three times, the plate being inked up afresh each time. Of course this meant double or triple time being bestowed on every impression, and it goes without saying that this could not be done for the price paid for much of the collotype work done in England.

Although power machines for collotype are costly affairs, hand presses are cheap enough, and where a hundred or two impressions from each plate only are required, as is usually the case in an ordinary photographic business, the cost with these will be less than if they were produced by a power machine.

SOME PRACTICAL ASPECTS OF RESIDUE COLLECTING.

OUR readers need not be informed of our views of this old subject; time after time we have harped on the one string, but it is our continual—we had almost written daily—experience that to an immense number we have so far written in vain. Our present intention, however, is to treat of some aspects of the subject on which less has been said than on the main topic. We would rather now point out how easy the whole thing is, and how much may be wasted. First, as to the residues

themselves, let us point out that it is entirely erroneous to suppose that there is no use in saving the hypo used from fixing plates. A case some little time ago came under our notice which may be pertinently introduced at this point. A professional photographer doing a good business adopted a rather unusual mode of fixing. Not wishing to be troubled with the worry of continually making fresh solution, he had a huge tank made, into which he could hang, on suitable supports, large numbers of plates at a time, and this lasted him for months. When it acted slowly he added fresh hypo, and so on. We must here interpolate the remark that we do not hold this method up as an example to be followed; we should decidedly object to it, if our opinion were asked; but, then, some photographers prefer their negatives to have a "rich yellow" colour. In course of time this particular tankful of solution got so dirty that its owner was about to run it off in the sink when a new operator he had recently engaged suggested to him the advisability of saving the silver. "Oh, that is no use, but you can try it if you like," was the reply. The operator did try it, and, when giving us the account of his experience, he said, as soon as he put the sulphide of potassium in, he got such a thick deposit "a stick would almost stand up in it." There was a very rich harvest, but the exact amount received was not disclosed. We all know, of course, that the smell of the sulphide is the objection always made to its being employed; but it really need be no trouble, for, whenever an excess is added, the vat is quickly covered by a scum, and does not smell afterwards, except just when the wash liquid is being run off, and this smell is quickly dissipated. We have heard of failures through old samples of the sulphide being used, and the photographer, not being familiar with its proper appearance, votes it a failure. A sample, when in good order, is only decomposed by the action of the air on the surface; hence, if one of the lumps or cakes be broken in pieces, it ought at the fractures to present just the appearance of a piece of liver with a light, opaque-looking "skin."

The best way to use it is to purchase it in bottles of, say, a pound each, and as soon as received to take out the cork, fill up with water, recork, and shake up after a while. It will then always be ready.

With regard to the precipitant, for what is usually looked upon, but incorrectly, as the "stand-by," or main source of value, the print washings, though hydrochloric acid (crude) is recommended on account of its causing quicker complete precipitation, many large printers still utilise common kitchen salt, as being always handy and possessing no dangerous properties like a corrosive acid. This latter, of course, is a strong point, but still there is always a loss, through some of the precipitate being dissolved.

Few collect gold residues; but it is certainly worth while to preserve old toning baths, but *not* washings. It is so easy to throw down the gold with iron sulphate always at hand, and a very little powder of gold brings in a good sum. The great point here is to give plenty of time for the precipitate to subside; so much will be wasted in pouring off the supernatant fluid.

It is no use whatever to collect old prints, but waste sensitised paper, old saturated blotting-paper, &c., are mines of wealth.

As to the mode of sending off the residues to the refiners, when once they are collected, it is important to remark that the practice, at any rate, of one large firm is to charge for the refining a percentage governed, to a certain extent, by the gross weight of the parcel as received; hence the less foreign matter the residues contain the smaller the net percentage taken off the actual value. This is the main reason why it is advisable to burn paper, &c., containing silver rather than to send it intact. At the same time, if there is no convenience for doing this, let the photographer send it as it is in a coarse bag; he need not lose his money because he can't burn up his paper. The loss will not be very great, nor will the extra carriage amount to much. The same with the valuable wet mass from the precipitating vats. It is no difficult matter to put it on a big piece of filter paper, transfer it to a dish, and "cook" it in the oven till dry; but, if this is a stumbling-block, wrap the mud up in several pieces of blotting-paper, enclosing the lot in a piece of calico, and send as it is. It will certainly cost more, but we know of instances where this difficulty has been allowed to stand in the way.

Finally, one more practical remark. With some houses it is the custom to take some little time before sending an assay note, and, unless the residues are very dry and compact, it would be very difficult to make a true estimate of their value by return. This being the case, we know of some suspicious mortals who assert that the delay is that the refiner may watch the market and time his note for a "drop." We may say this is simply nonsense, for the value given for the silver is that of the market price of the metal the day the parcel of residues is received at the refinery.

ANOTHER PHASE OF REVERSAL OF THE IMAGE.

A CORRESPONDENT this week sends us a print which really starts a new question as to whether the effect of light, upon an undeveloped plate and upon a printed-out surface respectively, is so far from identical as is usually supposed. The so-called "latent image," and the visible image formed by exposure to light of any of the usual printing papers, are generally accepted as being altogether differently constituted; and while the scientifically inclined amongst photographers are content to argue as to the correctness or otherwise of the idea of reversal of the image in negative or rapid films, no such suggestion has, to our knowledge, been made with regard to positive printing surfaces.

The print, however, sent by our correspondent, besides being interesting in other ways, raises the question whether reversal is not possible in the slower printing processes, even if it be denied in conjunction with more sensitive films. Studied chemically, the chances are much more in favour of a reverse action in the case of great over-exposure with any of the ordinary forms of printing papers than with plates or films of the rapid kind; but the chances of sufficient over-exposure in the case of printing surfaces is much less, and therefore instances are few.

Since the receipt of the specimen referred to in the letter in another column, we have heard further details of the print in question. It seems it was left on the printing frame until, as our correspondent says, "it would not print any more," and then presented the appearance of an almost equally exposed piece of paper, the image—a portrait—being just visible by reflected light in various shades of bronzing, and that image a negative one, when the now visible one is positive.

In the short time at our disposal we have tried to imitate the result, and, proceeding upon exactly similar lines, have succeeded perfectly. We have worked with gelatino-chloride

paper only. This has been left on the printing frame until so far over-printed that from the bronzing of the shadows the picture seemed to be a negative one. If the printing be carried to this stage, as may easily be done in sunshine at the present time, an image may be obtained which is practically a negative by reflection, the bronzing of the shadows actually appearing lighter than the deep colouration of the lights. Such was the condition at the stage to which we carried our experimental prints. They were then exposed openly to light for periods extending from three to seven days, but the shorter period seemed to be as effective as the longer.

At the end of the free exposure—that is, the exposure of the whole surface of the paper—the image, instead of being still farther buried in fog or bronze, gradually becomes more visible, until it presents itself as a perfect positive upon a metallic ground, in some instances strongly resembling a Daguerreotype, but with a "bloom" or dusty appearance that may belong to the paper, or may be part of the chemical change that takes place in the long exposure.

But the most important observation is that, in nearly every case, and more especially in the more protracted exposure, there is a partial bleaching of the image in an uneven manner corresponding with the unevenness of the layer of emulsion. Can it be that this and the dusty appearance already alluded to are due to a reaction of the chlorine given off by exposure to light? It seems probable, and the matter is worth diving into more deeply.

Photographing the Voice.—On the fifteenth ult. the New York Academy repeated, with gratifying success, their experiment of an annual exhibition. Among the various scientific instruments shown, the one which attracted most attention was an apparatus for testing and photographing the voice.

New Photo-theodolite.—This is described by Herr O. New in a foreign scientific journal. Its great feature is a geometrical clamp, which enables the surveyors to use and fix alternatively camera or telescope on the stand with rigid geometrically accurate centering. The clamp is of hard steel, in which are formed a hole, a slot, and a plane. In these fit the three spherical feet of camera or telescope. An arrangement for securing accurate placing of the plate forms also part of the design. The instrument is almost wholly of aluminium, and should be a valuable surveying tool.

A New Use for Nitrate of Silver.—It is not often that our readers possess such a surplus of this valuable chemical that they are desirous of finding fresh outlets for its employment, but an exceedingly interesting use for it was described in a lecture at the Imperial Institute by Mr. H. A. Miers. The double nitrate of silver and thallium when melted (which can readily be done at a temperature far below boiling) has a higher specific gravity than any other liquid known. It is as clear as water, and is five times as heavy. It is invaluable for testing the specific gravity of small solid objects, such, for instance, as valuable gems, for it can be mixed with hot water in any proportion, and so brought to any required gravity, and the object to be tested by floating or sinking will at once show its place in the scale of gems.

New Paths in Photo-micrography.—In certain paths of microscopic research, notably in working upon Virchow's theory of cellular pathology, the value of the results obtained is greatly influenced by the personal equations of the observers. To eliminate this element, Dr. C. L. Leonard, at the Philadelphia Academy of Natural Sciences, recently described a method he had devised, which consists simply in taking a series of consecutive instantaneous photo-micrographs of the moving and changing objects. Thus, incontestable proofs of phenomena are obtained, the changes taking place in the entire field of view can be observed and registered, and the series of observations may be extended for a protracted period. There seems every reason to believe that Dr. Leonard's plan will open out new fields of work, and lead to valuable acquisitions of knowledge.

Lunar Eclipse Photography.—At the last meeting of the British Astronomical Association there were some very interesting experiences recorded relative to photographing the recent lunar eclipse. Notwithstanding the use of isochromatic plates, the success of observers was very limited when essaying the totally obscured moon, which exhibited the usual colour, variously described as crimson, red, coppery red. One observer gave five minutes' exposure with a twelve-inch refractor, but the time was not enough to impress the whole of the moon's image. Another experimenter gave one minute, with the result, *nil*. Miss Everett recounted a droll experience; she described how an observer had "taken photographs," but, though the image was visible on the screen, his plates showed—nothing! Another gentleman gave twenty seconds and a minute, result—fog only. Another, a more cautious observer, stated that he had taken photographs, but had not yet developed them.

Astronomical Photographs without a Driving Clock.—Mr. Joseph Lunt, B.Sc., F.C.S., at the same meeting, described how he had obtained excellent stellar photographs without going to the expense of a driving clock, or even a slow-motion rod or tangent screw, only a gentle hand pressure being applied to the baseboard of the telescopic camera. The principle of the plan he advocated was the placing the star image (in the second or guiding telescope) much out of focus, so that it formed a visible disc. This being thrown on the intersection of the cross lines of the telescope, he found that he detected the slightest variation in size of the quadrants the out-of-focus image was divided into, and so enabled him to keep the photographic image central. The results he showed were considered admirable, and were a high tribute to his skill and care, for they embraced plates which had received exposures of half-hour and hour. Isochromatic plates were used, and a lens made by Hilger of two specially selected Jena glasses only, which had been found to give a maximum visual excellence with a special adaptability to photography.

PHOTO-MECHANICAL NOTES.

The theory of the half-tone process of photo-engraving invites, and seems to be receiving, a good deal of attention just now; but, either because theory seems to clash somewhat with practice, or because the theoretical idea is not susceptible of a very intelligible explanation, no very definite conclusion is arrived at, and to some minds it must appear very puzzling. The practical worker knows very well that, under certain conditions, definite results are obtained, and in his own way he can explain them so as to be quite intelligible to another practical worker; but the explanation is not scientific, and will not therefore commend itself to the hypercritical mind. Yet the problem of evolving a theory is not so difficult, after all, granting a knowledge of dioptrics, combined with a few practical considerations.

My own inclination is to seek in the phenomena of diffraction for an explanation of the effects attained in a half-tone negative, for, by taking the general law that a ray of light is inflected or diffracted on passing the edge of an opaque body, or through a small aperture with sharply opaque edges, it can readily be seen that, in the interposition of a half-tone grating, we have the conditions necessary for diffraction in a most favourable degree. We may regard the diaphragm aperture, illuminated by the exterior light, as the radiant, the grating as the opaque obstruction, and the ground glass or sensitive plate as the screen for the reception of the diffracted image. It

must, however, be borne in mind that, in order to secure a proper amount of diffraction, there must be a sufficient distance of the grating from the sensitive plate, and the greater this distance the greater the diffraction, so much so, in fact, that, at a distance of, say, half an inch, the spots of light merge into each other, and produce a continuous illumination, the screen producing no image of itself on the sensitive plate. To understand this better, we must also take into account the fact that the lines of the screen cast a more or less sharp shadow, according to the size of the radiant (as we may conveniently call the illuminated aperture of the diaphragm). The more the radiant approaches towards an infinite point of light, the sharper will be the shadow; hence practical workers know that, to secure sharpness of the screen on the sensitive plate, it is necessary to use a comparatively small stop. Diffraction in this connexion may be simply expressed as the tendency of the light to bend round the edges of the screen openings and creep into the shadow cast by the screen, enlarging the spot of light until, if there is sufficient separation, it will touch its neighbours.

If the shape of the radiant be round, as an ordinary diaphragm naturally would be, the shape of the spot of light on the sensitive plate would be also round, despite the fact that the openings of the screen are square. This is explainable by the statement that the dots formed on the sensitive plate by light passing through the apertures of the screen are really images of the diaphragm opening, each aperture of the screen acting as a pinhole lens. Any one possessing a screen can readily demonstrate this for himself by cutting diaphragms with variously shaped openings. For visibility, a narrow rectangular slit will best illustrate the idea, without having recourse to microscopic examination. If placed horizontal, it will give the effect of courses of bricks on the negative; if placed perpendicularly, the courses will run that way; whilst, if placed diagonally—that is to say, parallel with the lines of the screen—the effect will be that of single diagonal lines, in the same direction as the position of the stop.

In practice it will be found that a square opening is of greater advantage than a round one, because, as it is necessary that the half-tone negative should show in its highest lights transparent apertures with dense intersections, it can readily be seen that it will take a much longer exposure to join up four round dots at extremities of their circumference than it will to join up four square dots at their corners, chessboard fashion.

From a purely scientific point of view, it might be urged, Why not produce this joining up entirely by diffraction? This, however, would not work in practice, as the diffraction would annihilate the sharpness of the screen image, and we should get only a blurred picture, which would be unprintable. What we have to do is to balance the diffraction with the shadow sharpness, and so get the mean which achieves the finest effects.

It will be deduced that the amount of diffraction is directly proportional to the intensity of light, and if the grating is brought nearer to the radiant, without altering the separation of the grating and sensitive plate, the amount of diffraction will be increased. This is one reason why lenses of short focus and wide angle are unsuitable for the half-tone process.

A further point in regard to diffraction, as applied to the use of screen gratings, is, that, as diffraction is produced by the light impinging on the margin of the aperture in the screen, the proportion of diffracted light from a small screen opening will be in greater proportion to the light passing directly through than in the case of a larger opening, because the ratio of margin to area increases as the area is reduced.

To understand this, suppose we assume that there is no diffraction at all. It has been contended, in fact, by some, that diffraction has nothing to do with the theory of the half-tone process; but it will readily be seen that, if there were no diffraction, the effect of light passing through the screen would be only to produce dot images, more or less dense according to the intensity of the light reflected from the various parts of the picture. If this were so, the half-tone process would have been impossible, because even a tyro knows that for photo-engraving we require a negative, which is purely black and white, and not of varying density. By diffraction we secure larger or smaller dots, yet of equal density, instead of only stronger and weaker ones.

Again, if there were no diffraction, the dots would be thin in deposit of silver, and tapering off to a still thinner fringe at the edges; but by the aid of diffraction we build up the dot to a more even density all over, and especially increasing the density toward the edges. In fact, we may say, that the dot is pulled together and built up to a sort of mound of deposited silver, so that a reducing solution can be applied to the negative, and, acting most vigorously where there is least silver, will cut off the fringe without impairing the density of the central portion or summit of the dot. We can in this way reduce the size of the dots in the shadows, without reducing their maximum density. As we are dealing with the negative, it can easily be understood that, the greater difference between the size of the dots in the high lights and in the shadows, the better gradation we shall get in the resulting print.

Reverting to the question of the shape of the diaphragm, some curiosity has been evinced in the application for letters patent, made by Mr. Max Levy, for the improvements in diaphragms to be used in the half-tone process. The patent claims the advantage of using a diaphragm with small rectangular extensions at the corners. This in itself would hardly be a patentable idea, as Mr. Levy either gave it away or let it out long before his application for patent, and it has been used for some time by many half-tone operators. But I take it, that what Mr. Levy claims is not so much the shape of the stop as the principle of applying it by mean of an ingenious arrangement of annular plates in the lens tube, actuating in a somewhat similar way to the iris diaphragm. By this means the rectangular extensions may be enlarged or reduced, either independently or together with the enlargement or reduction of the central aperture. A very slight variation in the size of the extensions produces an essential change in the resulting negative. At the same time the quantity of light admitted in these corners is so small as to be effective only in the high lights, so that the increased light acts just where it is wanted most, and acts entirely without detriment to the shadows—that is to say, the shadow dots are not enlarged. Practical workers know very well that to keep the shadow dots of the negative small is a crucial point in attaining good work.

I do not think the considerations I have put forward towards the half-tone theory fully exhaust the subject, as I believe it can be demonstrated that the phenomena of interference, as well as diffraction, may come into play under certain conditions, and as a mere theory, which may not be workable in practice, it might be possible, by taking full advantage of optical phenomena, to dispense entirely with the present form and position of the screen.

WILLIAM GAMBLE.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

V.

IN copying ordinary photographs in scrap form, *i.e.*, when such are not mounted on stiff cardboard or any other supports, there are several methods which may be adopted for holding the same in a suitable position; some workers prefer sandwiching the prints between two sheets of glass, and binding these close together with the aid of a common clothes peg; others allege such a method is liable to cause reflections from the surface of the glass, and insist upon having some support free of any glass covering. With a properly understood system of working, however, reflections need never occur, the two main factors necessary to observe, so as to avoid such, being the employment of sufficiently long focus lenses, and the placing of the subject being copied at the proper angle in relation to the source of light and the removal of any bright objects in front of the picture being copied.

There is really no need, however, to resort to any covering glass for the purpose of keeping the print quite flat during the operation of photographing it.

The main factor is the employment of some support that will not warp in the slightest degree.

For a long time I used an ordinary printing frame with a cover glass, the print being pressed flat by means of the springs and back of the frame; but some time ago, when I had a large amount of copying to undertake, I hit upon a much more expeditious plan, and one that entirely dispensed with the employment of glass in front of the object being copied.

Whenever I have any silver prints in scrap form I now simply put a little clean water in a porcelain dish, and, without any hesitating, place the prints into the water to soak. As soon as they spread out flat in the water bath and become nice and limp, they are laid back downwards upon a sheet of glass, upon which lines are scratched with a scratching diamond corresponding to the height of the lens in the copying camera, when such is in position on the copying board; these lines are most convenient, because they guide an operator to place the picture, without any trouble, at once exactly in the proper position corresponding to the centre of the sensitive plate.

When the print is laid face up on the sheet of glass, a very gentle application of the side of the palm of one's hand passed over the

picture will cause it to lie most beautifully flat on the glass, and in this condition it will attach itself to the surface of the support for a sufficiently long time to enable several plates being exposed if such is desired.

With this mode of working there is no warping, and the pictures are with the greatest of ease brought to assume their true position to the sensitive plate.

After exposure, the prints are lifted off the glass, set aside to dry on clean towels, and then a warm smoothing iron passed lightly across their faces will make them appear very often brighter and better for their wash.

In cases where pages in bound books have to be dealt with, much convenience will be experienced in copying the same when a little trouble is expended in providing a suitable arrangement for holding the page flat and at right angles to the sensitive plate.

One very serviceable method is to have a square box, with top and bottom knocked out of it.

On one of the outer sides of this box a line should be ruled or scraped corresponding to the height of the lens when such is fixed in the camera, and all the apparatus placed on the copying board. Around this side of the box (both inside and out) are stretched two hoops of strong hat elastic—such as ladies use in their head gear—the ends are best sewn together, they will then be able to be moved up and down the side of the box, so as to permit of their being adjusted at any height it is required to have them.

The page to be copied is laid face up against the side of the box—the ruled mark will at once be a guide to the height at which the centre of the picture must be brought—the two hoops of elastic are then stretched over the page, one close in at the binding, the other at the extreme edge. Should there be any bulging of the page in the centre, a difficulty frequently met with in books printed on stout paper, two small slips of wood, of exactly the same thickness, inserted under the elastic bands one at either end over the margin of the book, will generally suffice, with a little coaxing, to make the most stubborn case of bulging lie perfectly flat.

Sometimes, when operating on pages near the beginning or towards the extreme end of the book, difficulty will be experienced in getting the page to keep an upright position. Very frequently, owing to the depth of the binding in the book, the edges of the page will lie further back than the inner portion. The best way to overcome this difficulty is to pad up the space between the box and the book cover until such assumes an upright position; numerous little slips of wood of varying thicknesses are suitable to fill up this space.

In contradistinction to black-and-white working, to which I referred in my last article, the treatment necessary in the copying of ordinary photographs differs materially from that employed when the chief aim is to obtain the utmost amount of contrast, as would be the case when dealing with purely black-and-white subjects.

In subjects containing a distinct range of tint, from pure high lights through middle tones into deep shadows, and where a large amount of fine detail is present, the employment of a good isochromatic plate of medium rapidity is preferable to the slow lantern plate which I recommended for black-and-white negatives.

With just the correct exposure to suit the developer employed, these isochromatic plates will yield most exquisite results, provided a reasonable amount of precaution be observed in shielding the plate at the earlier stages of development from the light of the developing lamp.

A properly exposed plate will soon show itself in development by the beautifully gradual manner in which all the tones of the original will come along and build up one after the other. A correctly exposed plate will need neither forcing nor retarding in development, and, whenever in copying such has to be resorted to, the best results will never be obtained, and, without any waste of time, another plate should be exposed, or even as many more, until a perfect result is obtained in the negative. This means the presence of such gradations and densities as will print in exactly the same ratio to each other as the high light, middle tints, and shadow assumed in the original.

Intensification plays a most important part in black-and-white negatives; but, in instances where delicate middle tints are being dealt with, the finest results are secured when the necessary vigour is obtained by development alone, and this is, as I have pointed out, obtained by an absolutely correct exposure, dovetailing with a well-balanced formula for development.

In dealing with ordinary silver prints, hardly any two examples will be found to correspond in time. Some will have the nice chestnut brown, others will be found verging into the purple.

The exposure of the plate must be made to suit in all cases, some taking very much more time than others.

T. N. Armstrong.

OUR ENLARGING APPARATUS AND WHAT TO DO WITH IT.

I.

In preceding articles I have described certain apparatus which, in my opinion, deserves the attention of the amateur, the characteristics of such being reasonable weight, portability with strength, and freedom from vibration during the necessary manipulations, the latter a consequence of easy working parts. The camera, it may once more be remarked, has bellows body, a shutter for the lens, a good dark slide and focussing screen, which fit into either end of the body, and a set of negative carriers which can be used for smaller plates (in the dark slide) when copying from prints, &c. With this apparatus we can do practically all that comes within reasonable photographic possibilities.

Firstly, we can make, from *negatives*, transparencies of various sizes for decorative and other purposes, and large positive pictures on bromide paper or opal plates.

Secondly, we can get, from good, clear transparencies, large negatives for contact printing by various processes, and cloud negatives on paper or glass.

Thirdly, copies, and of course large, direct negatives, from positive prints.

It is hardly necessary to say, but the fact must not be lost sight of, that some extra expense may naturally be expected to follow the possession of a large camera. In the course of my remarks, the beginner will be able to gather an idea as to the probable cost of following up certain processes.

The initial cost is in the direction of at least three large, deep dishes, and a stout, well-made printing frame. The latter should be a size or two larger than the dimensions of the negative with which it is intended to be used. For a negative measuring 12×10 a frame 15×12 should be chosen, and it is advisable to let it be fitted with a piece of thin plate glass and a pad of felt. We shall find this frame very useful, not only for use with negatives in the usual way, but for cloud-printing, where the advantage of plenty of room in which to adjust the negative and print is an absolute necessity. It is also a positive fact that one really good printing frame is worth a dozen of the cheap kind.

Chemicals, of course, will be required in larger quantities, and must not be stinted.

Bromide paper, fairly rapid and not too thick in texture, is the next item, followed by a packet of dry plates of ordinary speed and of large size, by which time we shall be in a position to go ahead and make large reproductions from such of our negatives as appear most suitable for the purpose.

I am not myself quite certain whether, working through the camera, simple bromide enlarging *is* really the simplest process for amateurs, but as an *educational* process it is highly desirable.

A negative is selected, cleaned, spotted if and where required, and the degree of enlargement calculated and noted. We then put the negative into the carrier, and, having estimated the distance it is to be put in front of the lens, we draw out the frame to the required number of inches, and, on the other side, draw *back* the frame carrying the focussing screen to *its* proper position, the measured baseboard greatly facilitating this little preliminary business. We may now direct the camera to the best light, pointing it, so to speak, at the best-illuminated bit of open daylight, and may then fix the baseboard so that our further operations may be carried on with both hands free for the work. I have referred already to the necessity for a screen of fine ground glass, fixed up in front of the negative, through which to filter the daylight, and therefore *even up* the illumination. We can only find out the great use of this by trying to do without it. We often do not see, until the paper is developed, where the fault has lain. Chimney-pots and tops of houses, reflections from passing clouds, and suchlike undesirable outside objects, will often be found partially defined on our pictures, and spoil the same by their presence, hence the reason we use a screen of ground glass between the negative and daylight. This is for work carried on at an upstair window, high up above the ground. On the ground floor we should be obliged to use in addition a reflector of white cardboard, placed at an angle of 45 degrees in advance of the screen. We may now use a focussing cloth, and take a look at the enlarged image, which, if our calculations have been exact, and our precautions as to lighting secure enough, should be found sharply defined and *evenly* illuminated. We shall probably have to make a little correction, which will be quickly managed by moving the frame further from or closer to the lens; and then, having got the best focus possible with the lens at full aperture, we insert a smaller diaphragm, until the amount of sharpness, judged by further visual inspection, is satisfactory.

Bromide paper should be selected *exactly* of size required for the dark slide, and it is certainly better to use a special carrier to support the same during the exposure in preference to having it resting face down on to a piece of often indifferent glass. This carrier may be simply a thin mahogany frame, made of fretwork wood, or a piece of the same wood measuring exactly 12 × 10, or whatever size is used. The paper is attached by means of small drawing pins.

In the dark room, or by ruby light, we place a piece of paper (bromide) face up on to the carrier, and attach it to the support with the pins provided. It is always advisable in practice to avoid touching the sensitive surface with the fingers, therefore a piece of quite clean white paper may be used at all times when it may be necessary to press down or smooth out the paper at certain parts while down, and again when removing the pins. Put the carrier into the dark slide, this time face down, of course. Secure the back, and, covering all with the focussing cloth, return to the operating room. Having focussed the picture, and got as much covering power and sharpness out of the lens by the insertion of smaller stops as possible, it is well to take mental note of the diameter of the stop finally chosen, and compare it in fractions with the focus of the lens. A diaphragm equal in diameter to one-sixteenth of the focus of the lens *should* give ample definition, and if we once get an idea of the exposure necessary with this stop, bearing in mind also time of day and year, density of negative and rapidity of paper, we shall rarely be at a loss in future trials to hit upon an approximately correct number of seconds or minutes.

To give the beginner an idea, I find, with a rather slow brand of paper, an exposure of *five minutes* is, at this season of the year, required, using *f*-24, to yield a well-exposed enlargement. Instead, however, of going at it in a rather hap-hazard manner, we may make trial exposures upon a slip of paper, drawing the shutter out an inch or two at a time, and giving an exposure at each stage of, say, one minute. Develop the strip, and then give the full sheet the exposure which promises the best results. I prefer an amidol developer, which gives an excellent tone by the simple action of development only. The solution should have a restrainer, and development allowed to proceed not too quickly, so as to keep the operation well under control. If sufficient density is got, the colour of the fixed and washed print is all that can reasonably be desired.

Development must follow the lines laid down in the directions given with the paper. Briefly, the exposed paper is wetted thoroughly by immersion in a bath of clean water, removed, and placed face up in another clean dish, a more than sufficient supply of developing solution, properly diluted or restrained, poured over it, and after development poured off, when we at once flood the print with clean water, changing the latter two or three times before allowing the print to remain soaking, pending the operation of fixing, which should be deferred, so as to prevent risk of splashing or stains during further development.

In place of an amidol solution may be used ferrous oxalate, an old-fashioned but reliable and clean developer, rather slower in action compared with some of the newer chemicals. The tone of the developed print is not as a rule so black and generally pleasing as when amidol is used. Hydroquinone, metol, and eikonogen are also available, and make very efficient developers.

For large transparencies we may use those sensitive plates made by the well-known lantern-plate manufacturers, or the Ilford ordinary plate (yellow label). The exposure for a 12 × 10 transparency from a half-plate negative, using the same lens and stop, and one of the latter plates may, in a good light, at this season of the year, be reckoned at three minutes, the negative being a trifle thin and the developer amidol. The focussing should be very accurate, so as to get a perfectly sharp picture. For this work we require the plate to develop up clear and strong, no fog or heavy deposit in the wrong places being allowed to make its appearance; we can get a good healthy tone with developer only, making allowance for a certain amount of loss during fixing. If the result is an under-developed positive, that is to say, all detail visible, but insufficiently strong or dense, then a simple intensifier, such as mercury, will put things right.

It must not be forgotten that a large plate must be very carefully and thoroughly washed between the various baths, and particularly after fixation. Plates of this make, developed clean and vigorous (and this is by no means difficult to do), make very good transparencies for window decoration. They should be varnished and mounted in contact with a perfectly clean ground-glass plate of similar size, then bound up with paper in the same way as one would a lantern slide; or, what is better, mounted in a brass frame or support. These frames are marketable goods, and no difficulty should be experienced in getting them from the dealers.

No doubt some trouble will be experienced at first, arising from the novelty of the work, size of plate, and so on; there is nothing to be done here but to keep cool, and not allow oneself to be flustered and worried. We soon get accustomed to the handling of large plates and prints. The smaller the workroom, the greater the necessity for method and the orderly arrangement of material.

The making of enlargements on opal, bromide, or chloride plates, is, of course, excepting only the exposure, practically identical with that of simple bromide enlarging, the plate taking the place of the paper. Matt-surface opals are very fine indeed; if made of *bromide* emulsion, the exposure will be much the same as if paper were used. *Chloride* opals, on the other hand, require considerably more exposure, but, as a compensation for this drawback, it is easier to tone them.

For use in our camera I prefer to expose them under a mask, that is in order to leave the finished picture with a clean white margin, the shape of the mask being that known as dome or cushion. Vignetting is an operation rather troublesome in the camera; it is necessary to interpose a card or frame, having an opening of the requisite size and shape cut in the centre, and serrated at the edges between the lens and plate. The shape and distance must be judged naturally by the worker himself to suit the particular case. If the subject be one taken for the purpose of vignetting, a portrait with a very light background, the operation will, no doubt, be easy enough; but, if there is a *dark* background, or one composed of landscape, the chances are rather against a satisfactory and harmonious result.

I like to see a clean white margin even if it has to be covered up ultimately with the mount. A clean margin is a good indication of the condition of the remainder of the film, as the result of the action of developer, fixing solution, or other necessary chemical. If it has gone through all this treatment and still shows up white and clean as it should, we may be pretty certain that there is not much amiss with the film generally.

Bromide paper and opals may be toned or intensified to a variety of more or less interesting colours. Such a subject forms a volume in itself, and in these articles I merely touch the fringe of it. We get by the use of various developers, such as ferrous oxalate, metol, hydroquinone, amidol, &c., various tones according to exposure, strength of developer, duration of development, and so on. After thorough fixing and washing, these tones may be altered by the action of certain chemicals. On no account, therefore, should the beginner be discouraged if his developed image turns out to be rather cold and flat. The indispensable condition is to get a clean picture, amply exposed, free from fog and stains; this is to be done at all times by extreme carefulness in the handling of the sensitive material, precautions against faulty illumination both in and out of the dark room, development with fresh solutions, and thorough fixing and cleansing of the film. If we do this, we may safely reckon upon making something, by after-treatment, of our rather poor and underdone picture.

J. PIKE.

SOFTNESS OF DEFINITION.

A QUESTION possibly never raised before the advent of the photograph was, Could definition *of itself* render a picture inartistic providing its other art qualities were undoubtedly good? The answers to this have been of the most conflicting natures, some contending that definition was the bane and destruction of all pictorial qualities, and others that fuzziness or want of definition was absurd, and on no account to be tolerated. It is not to be supposed that men of acknowledged reputation as artists, but holding different opinions, should do so without at least some substantial reason for it. It seems to me to be on a par with the story of the gold and silver shield; both may be right. It all depends on the standpoint from which they take their judgment. That a photograph must be absolutely sharp all over to be good is just as wrong as that one with few points of absolute sharpness must be bad. Our judgment must be guided by the general effect of the composition rather than how that effect is produced, whether by definition or the want of it. At the same time, if we neglect the power of producing detail, we certainly throw over one of the most attractive and unique effects of photography, and one that no other process will supply.

The glorious ambiguity of the dictum enunciated by one writer of considerable repute is that "our pictures should be as sharp as the eye sees them, no sharper," which seems about as definite a description as the size of a thing being compared to that of a lump of chalk. The eyes of very few people are precisely alike, and even those of the same person vary at different times in power of penetration and focus, so what might be absolutely sharp to one person might seem blurred or indistinct to another, and *vice versâ*. At the

same time, for the majority of pictures, optical sharpness is unnecessary, a statement that is accepted by universal consent. The exception to this rule is, when the negatives are specially intended for enlargement, or for some purpose that necessitates the most exact reproduction, but such is not the case with ordinary landscapes and portraiture, when *good* definition is sufficient for all purposes. As this expression, "good definition," may be deemed ambiguous, I would say that, if the three-inch letters on a placard at a distance of one hundred yards are clearly readable with a magnifier on the focussing screen, the defining power of that lens is good enough for anything of an ordinary character. Even worse definition than this would not prevent a good picture being taken since rough, coarse papers have been popular. *Particularly* good definition on the negative is simply thrown away, such pictures are intended to be examined at a little greater distance than those on smooth surfaces, therefore *fine* detail is useless, or worse than useless. The best effect on such surfaces is gained by clever arrangements of light and shade, altogether irrespective of definition. If the principal objects are tolerably well made out, a photographer may please those who look *exclusively* to artistic effects; but, failing in composition and chiaroscuro, the fuzzytype becomes the laughing-stock of most people, being a failure all round, a fiasco as a picture, an absurdity as a photograph.

We may look at definition from another point of view. It often happens in nature that the distance and mid distance, from the effects of vapours or heat, become more or less indefinite, and at such times very beautiful effects may be observed. It stands to reason, a photograph to be true to nature must record this indistinctness distinctly, with the result that the image is apparently out of focus, although it is no such thing. If by any means, such as by screens and orthochromatic plates, the haze is obliterated, so to say, instead of improving the picture we falsify it, and, as far as I can see, do not add to its artistic claims, for a certain amount of *natural* indefiniteness is a most valuable quality, supplying that always welcome characteristic, suggestiveness. A sharply defined picture does not mean that the photograph itself should be different to the original, but merely that it should be no more blurred than the original is. It sounds somewhat paradoxical to say that a blurred and indistinct photograph can be absolutely sharp, although this definition may be perfectly correct. Those who have no means of judging, except from the finished pictures, are somewhat handicapped in forming a correct opinion on the want of definition; it may be natural and correct, or merely an experimental vagary on the part of the photographer.

There is, however, a difference between the imitation and the real effect, inasmuch as nature invariably provides sharp foregrounds, indistinctness gradually increasing with the distance, unless it happens to be local, owing to the effects of vapour, heat, or smoke, over a limited area, when the cause is evident, objects beyond the range of such influences remaining sharp and well made out, although, even on the clearest day, the detail of more distant objects, of course, is less easily made out by unassisted vision. That they remain practically as sharp is conclusively shown by the aid of a good telescope, and, as I have already said, the amount of definition depends entirely on the power of individual eyesight.

With artificial blurring there is no discrimination; the whole subject is blurred evenly, and without any respect to distance more than foreground, or the focus is sharp on one plane and not so on any other. When this latter plan is adopted, it is less objectionable than the blurring of the whole subject; but very much depends on how it is managed, and the amount of the blur, and also somewhat on the subject itself. At any rate, when blurring is resorted to, it is for the sole purpose of creating an effect of atmosphere that did not exist when the negative was taken.

It seems to me to entirely mistake the use and action of a lens when we deliberately discard its peculiar and unique power to render detail so unique that no other existing method will do it, especially when better effects can be obtained by sharp focussing, if atmospheric conditions are suitable. The dictum that every part of a picture should be subservient to the principal object or objects, by being less sharp, is not of universal application, even in paintings; to wit, the beautifully made-out interiors of many of the Dutch masters. No blurring is indulged in these; the motive of the work is obtained by clever composition and lighting; each square inch is as full of detail as another. It may be said blurring is not applied to interiors, but in a very limited degree. The long aisle of a cathedral is less distinct at the end farther from the observer than the nearer portions, and, owing to the effect of sunshine on the dust, frequently *very* indistinct; but he would be a bold photographer who would deliberately put his lens out of focus to get this effect. He would probably focus on the most conspicuous and important portions of the edifice, and endeavour to get the whole subject, from one end to the other, as well defined as it was possible to get it. To be consistent, the advocates for diffusion of focus and false atmosphere should *not* try to get the whole of the building equally well defined, if the building *was* free from dust, showing the distance beautifully distinct. This must be removed by one or other of the methods of softening so popular of late. There is undoubtedly something fascinating to many in the dreamy indistinctness of a picture when it is good in other respects. There is to myself; but that indefiniteness must be the result of a sharp transcript of nature, and not a nondescript make-up that merely raises curiosity to know for what it is intended.

There are numberless occasions when the state of the atmosphere provides exactly the sort of conditions required (which if taken advantage of will produce real pictures that are satisfying and pleasurable to look at). In photography a little mist or fog goes a long way, a slight haze is quite sufficient to produce much indistinctness, especially if the development is forced and the exposure somewhat too brief—the best effects of haze are got with a full exposure and rather quick development. But, like all other specialities in photography, a little practice is required to get the best results. The probability is the negatives will turn out a hopeless muddle for the first few attempts, owing to under-estimating the actinism of the haze, which is much greater than might be anticipated. Objects distinctly visible will be buried in density before the darker objects on the foreground are sufficiently developed; before attempting work of this kind, the mind of the photographer must be made up as to the exact kind of picture he requires, the result must be preconceived and not left to accident, or it will only be by chance that he will get a presentable result. I have heard of going out "fogging," but have not been sufficiently fortunate to see the results.

After all, why is this hankering after diffusion of focus and indefiniteness? Is it a reaction after a surfeit of the map-like distinctness that we have become accustomed to, or a crudescence of artistic feeling that carries us somewhat beyond the domains of art? Until photography came to the front, comparatively a very small amount of detail sufficed in landscape work. Witness the works of David Cox, Girtin, and numerous others; a line or a dash of colour suggested acres of space, and filled these acres with detail, not actually there, but mentally created by the skill of the painter who, by a few touches of the brush, led the observer to feel with him, and to picture to himself the sentiments and designs so cleverly suggested. Colour is a great assistance in this respect, and the photographer who is limited to monochrome is also limited in his power to suggest, *after the manner of the painter*, so must, in a certain degree, use the exquisite details of the photograph as compensation.

Each kind of work has its own strong points. The painter can no more produce the *minutiæ* of the photograph than the photographer can, by a little fuzziness produce the effects of clever brushwork. The expression of a simple line is often more eloquent than the packing together of thousands in a less subtle manner. On this account a painter can impress his individuality on his work much more easily than a photographer can on his. So much, then, for paintings as object-lessons for the photographer. They are not to be looked on as precedents for fuzziness, or, rather, paucity of detail, but as guides to the balance of interest of one portion of a picture with another. Neither will definition nor detail of themselves produce the effects of atmosphere. Take any photograph where the distance is hard and sharp, and consequently too deep in colour, we at once decide it is deficient in atmosphere; by judicious printing and shading the distance is rendered much *lighter* in proportion to the foreground, when without farther trouble we have mechanically introduced atmosphere, or rather a substitute for it, and this without altering the definition in the slightest degree. Not that such a picture would bear comparison with the subtle effects of true atmosphere obtained on the negative from nature direct, which pervades it throughout from foreground to distance, and confers that inimitable softness and delicacy that no after-manipulation can possibly supply.

EDWARD DUNMORE.

A METHOD OF PREPARING PLATINOUS SALTS FOR PHOTOGRAPHIC USE.

THE increased favour which platinum printing and toning has lately found amongst photographers has led to the publication of more than one method by which platinous salts may be prepared from the waste residues of the photographic laboratory. After an extensive series of trials of these methods, however, it seems to me that by far the simplest and most convenient process for an unskilled chemist to adopt is one of which but little has been written, and the details of

which are not readily accessible to those who may be anxious to prepare their own platinous salt.

Before describing the details of this process it will be useful to give a brief summary of the various methods which have recently been advocated. One and all of these agree in starting from the soluble platinic chloride, $PtCl_4$, into which the metallic platinum residues are first converted by the action of aqua regia. It will, I think, be safe to assume that every photographer is sufficiently supplied with information on the simple precautions to be taken in preparing this substance, a matter which has been already fully treated in a recent number of this JOURNAL.* From this point, however, there are several alternative methods of procedure in order to convert the platinic chloride into a salt suitable for photographic use, for the tetravalent compounds of platinum are useful neither in printing nor toning, and must therefore be transformed into the divalent forms.

The first plan to be mentioned possesses the advantage of extreme simplicity if a platinum toning bath only is desired. This consists in cautiously adding, in separate small quantities, to the platinic chloride solution, whilst boiling, sufficient sodium sulphite to convert the platinic salt into potassium chloro-platinite. The exact quantities may be found from the following equation, representing the reaction which takes place :—

$$PtCl_4 + Na_2SO_3 + H_2O = Na_2PtCl_4 + H_2SO_4$$

About ninety-six grains of sulphite for each drachm of platinum contained in the platinic chloride will be found sufficient for the purpose. A great objection to this plan, however, is, that it is not always easy to know the exact strength of the platinic chloride solution which is being dealt with. The uncertain composition of commercial sodium sulphite also is an obstacle to its employment in exact quantities. It is not easy, therefore, to ensure complete conversion of the platinic salt, traces of which are prejudicial in the toning process.

A second method is to reduce the platinic chloride to platinous chloride, $PtCl_2$, by heating it for some time to a temperature of between 200° and 300° C., subsequently treating with potassium chloride to form the double salt. In practice, great care is necessary to avoid incomplete conversion, with the resulting consequence of a bleaching action on the silver image when used for toning; while, if the temperature should rise too high, the salt is reduced to the metallic state, and the whole process of solution in aqua regia has to be repeated.

Still another plan is to reduce the platinic chloride by passing sulphur dioxide gas through a boiling solution; a plan which also requires very close watching to find when the change is complete.

All the above methods deal with the reduction of platinic chloride direct, and, as has been shown, without the greatest care there is the continual and even subtle danger of incomplete conversion. For this reason it will be found much more convenient to convert the platinic salt into the insoluble double chloride of potassium and platinum, K_2PtCl_6, before attempting its reduction. This is readily accomplished by adding to the concentrated platinic solution an excess of a saturated solution of potassium chloride, and collecting the insoluble yellow precipitate which falls. The insolubility and weight of this precipitate render it easy to manipulate, and it may be washed and dried, and kept indefinitely for future use.

For the conversion of this double salt into the soluble potassium chloro-platinite, Cary Lea has recommended either to heat moderately with a solution of potassium acid sulphite over a water bath, or to reduce it by means of alkaline hypophosphite. Various details must be attended to in either case. These are fully dealt with in Cary Lea's own description of the process. †

In my own practice neither of these methods prove so suitable, considering the limited appliances of an ordinary photographic laboratory, as Thomsen's plan of reduction by cuprous chloride, which I now proceed to describe in detail. In the first place, the preparation of cuprous chloride in bulk is a perfectly simple operation by the following process:—One part of common salt is added to two and one-eighth parts of copper sulphate, and the mixture is dissolved in water and placed in a narrow-necked bottle, provided with a cork. Into a boiling flask a few pieces of charcoal are now placed, and enough sulphuric acid to cover them. This flask is provided with a cork, into which is fitted a bent glass tube, having one branch long enough to reach to the bottom of the bottle containing the copper solution. When placed in position, heat is applied to the flask until a steady stream of sulphur dioxide gas passes through the copper solution. After a few minutes, a shining white precipitate of cuprous chloride begins to fall, and soon accumulates in a thick layer at the bottom of the bottle. The reactions are as follows:—The mixture of salt and copper sulphate produces cupric chloride,

$$2NaCl + CuSO_4 = CuCl_2 + Na_2SO_4$$

The cupric chloride is then reduced to cuprous chloride by the sulphur dioxide, thus:—

$$2CuCl_2 + H_2SO_3 + H_2O = Cu_2Cl_2 + H_2SO_4 + 2HCl$$

It is well, after passing the sulphur dioxide gas for some time to remove the flask and cork up the bottle for some hours to enable the cuprous chloride to settle thoroughly to the bottom. It can then be washed by decantation with a little dilute sulphurous acid, and, finally, with glacial acetic acid, if required pure. For the present purpose, however, slight traces of cupric chloride will not be prejudicial, and extra care in washing is quite unnecessary.

We now pass to the reduction of the platinic salt by means of the cuprous chloride thus prepared. The yellow, insoluble potassium chloro-platinate, K_2PtCl_6, is made into a thick paste with water, and warmed in a dish over a water bath. Moist cuprous chloride is now added little by little, with constant stirring, until nearly all the platinum salt is dissolved; but the process should not be carried so far as to decompose quite all the platinum salt. For complete conversion, 100 parts of platinic salt require 40 parts of cuprous chloride. The liquid at this stage is nearly black, and so concentrated that it is advisable to filter rapidly before crystallisation begins. After filtering, crystallisation is complete in a few hours. The crystals are now washed with alcohol, redissolved in water, and recrystallised, when fine, large, rose-coloured needles of great purity and beauty are obtained, from which solutions of any required strength may be made.

Carey Lea objects to this process on account of a liability to a reverse action, by which the platinous salt is reconverted into platinic salt at the expense of the cupric chloride present. The ordinary process of conversion described above is a simple reduction by cuprous chloride, thus:—

$$Cu_2Cl_2 + K_2PtCl_6 = 2CuCl_2 + K_2PtCl_4.$$

The reverse action may take place if the solution is made too hot,* and also if too much cuprous salt is added; but, if care is taken to avoid these two excesses, it is not difficult to obtain very nearly the theoretical quantity of platinous salt. In the case cited by Carey Lea, half a litre of mother liquor was set aside for spontaneous evaporation, and after several days the red platinous salt, which first formed, was found to have relapsed entirely into the platinic condition. If, instead of so large a bulk of solution, a paste only is operated upon, as described above, instead of a day, a few hours only will furnish the crystals of platinous salt without any danger of reversion.

In order that the experimenter may test the result of this method, it must be remembered that 100 parts of metallic platinum will give nearly 249 parts of potassium chloro-platinate, and this should yield nearly 213 parts of potassium chloro-platinite. Of course, the actual amount will be rather less than this if the precaution recommended above is adhered to, and the process stopped just short of complete conversion.

Another method of reducing platinic salt has been described by Böttger.† It consists in passing sulphuretted hydrogen gas through potassium chloro-platinate suspended in water, but this method does not seem likely to be of any advantage to the photographic chemist.

J. VINCENT ELSDEN.

* THE BRITISH JOURNAL OF PHOTOGRAPHY, vol. xli. p. 803 (Dec. 21, 1894).
† THE BRITISH JOURNAL OF PHOTOGRAPHY, vol. xli. p. 756 (Nov. 30, 1894),

ON REACTIONS ACCOMPANYING THE DECOMPOSITION OF SODIUM THIOSULPHATE IN FIXING PHOTOGRAPHIC PLATES.

[Translated from the French by G. E. Brown, A.I.C.]

IT is known that sodium theiosulphate, which is currently employed for the removal of salts of silver from photographic plates, is a very unstable substance, susceptible of decomposition by the various reagents with which it is associated in photographic practice, and that this decomposition is one of the principal causes of the alteration which photographic prints in silver undergo in the course of time, and also of the changes which take place in the combined fixing and toning bath for sensitive papers. It therefore appeared to us to be of interest to endeavour to throw some light on the character of the complex reactions which take place in these decompositions, and to inquire within what limits the means hitherto proposed for avoiding them are of service.

In doing this we have studied the action of sodium thiosulphate on the two reagents which are the cause of all its decompositions:—

1. Acids.
2. Alum.

* Thomsen, *Journal für praktische Chemie* [2], xv. p. 294.
† *Journal für praktische Chemie*, xci. p. 251.

In studying these reactions, the practical conditions which prevail in photographic practice, viz., excess of thiosulphate at ordinary temperature, must be reproduced. These conditions have been very incompletely examined hitherto,* and the reactions which accompany them are quite different from those more common ones, in which no excess of fixing agent is present, and with which the photographer is not concerned.

I. Action of Acids on Sodium Thiosulphate.

When an excess of acid is allowed to act in the cold on sodium thiosulphate, that salt undergoes the well-known decomposition into sulphurous acid, sulphur and water, according to the equation

$$SO_2 \left\langle \begin{matrix} SNa \\ ONa \end{matrix} + 2\,HM = 2\,NaM + SO_2 + H_2O + S. \right.$$

It may be assumed that, in an intermediate reaction, thiosulphuric acid is liberated, and splits up at once into sulphurous acid, water, and sulphur.

$$SO_2 \left\langle \begin{matrix} SH \\ OH \end{matrix} = SO_9 + H_2O + S. \right.$$

When the experiment takes place in presence of excess of thiosulphate, the existence of sulphuretted hydrogen may easily be detected, and the formation of sulphurous acid and a sulphate established. The formation of these two substances may be explained as follows :—

Nascent thiosulphuric acid in presence of excess of sodium thiosulphate gives rise to acid sodium thiosulphate, a very unstable body, which subsequently decomposes into sodium sulphate, sulphuretted hydrogen, sulphurous acid, and sulphur. These reactions may be represented by the following equations :—

(1) $$2\,SO_2 \left\langle \begin{matrix} SNa \\ ONa \end{matrix} + 2\,HM = 2\,NaM + 2\,SO_2 \left\langle \begin{matrix} SNa \\ OH \end{matrix} \right.\right.$$

Neutral sodium thiosulphate. — Acid sodium thiosulphate.

(2) $$2\,SO_2 \left\langle \begin{matrix} SNa \\ OH \end{matrix} = Na_2SO_4 + H_2S + SO_2 + S. \right.$$

The following equation summarises the principal reaction which any acid produces in the cold on sodium thiosulphate :—

$$2\,SO_2 \left\langle \begin{matrix} SNa \\ OH \end{matrix} + 2\,HM = 2\,NaM + Na_2SO_4 + H_2S + SO_2 + S \right.$$

But the decomposition of the sodium thiosulphate does not end here. In fact sulphurous acid and sulphuretted hydrogen are both able to decompose the thiosulphate, and also to react on each other.

We will examine these different secondary reactions in turn.

(*a*) *Action of Sulphurous Acid on Sodium Thiosulphate.*—The action of sulphurous acid may be considered as a particular case of the decomposition of sodium thiosulphate by an acid. The reaction is precisely similar to that produced by an acid, except that sulphurous acid, instead of being disengaged, is absorbed by the sodium sulphite formed, producing sodium acid sulphite.

We may therefore express the reaction of sulphurous acid on excess of sodium thiosulphate thus :—

$$SO_2 \left\langle \begin{matrix} ONa \\ SNa \end{matrix} + H_2SO_3 = 2\,NaHSO_3 + S \right.\dagger$$

If the sodium thiosulphate is in excess, the nascent thiosulphurous acid, which is displaced by the sulphurous acid as by any other acid, forms sodium acid thiosulphate, which subsequently splits up into sodium sulphate, sulphuretted hydrogen, sulphurous acid, and water. These reactions may be represented by the equations :—

(3) $$2SO_2 \left\langle \begin{matrix} S\,Na \\ O\,Na \end{matrix} + H_2SO_3 = Na_2SO_3 + 2\,SO_2 \left\langle \begin{matrix} S\,Na \\ O\,H \end{matrix} \right.\right.$$

Sodium acid thiosulphate.

(4) $$2SO_2 \left\langle \begin{matrix} S\,Na \\ O\,H \end{matrix} = Na_2\,SO_4 + H_2S + SO_2 + S. \right.$$

Hence the above equations represent the reaction which sulphurous acid produces on excess of sodium thiosulphate in the cold.

(*b*) *Action of Sulphuretted Hydrogen on Sodium Thiosulphate.*—The sulphuretted hydrogen liberated by the action of an acid on excess of sodium thiosulphate reacts very slowly on the thiosulphate, and decomposes it little by little into sodium acid sulphite, sodium acid sulphide, and sulphur, according to the equation—

$$SO_2 \left\langle \begin{matrix} S\,Na \\ O\,Na \end{matrix} + H_2S = SO_2 \left\langle \begin{matrix} O\,Na \\ O\,H \end{matrix} + Na\,H\,S + S. \right.\right.$$

(*c*) *Action of Sulphurous Acid on Sulphuretted Hydrogen.*—Finally, a third secondary reaction is that of sulphurous acid on sulphuretted hydrogen, which gives rise to pentathionic acid, which in its turn reacts on the thiosulphate, giving sodium pentathionate and thiosulphuric acid. This latter forms sodium acid thiosulphate with excess of sodium thiosulphate, and the acid salt undergoes decomposition, as already mentioned. These reactions may be written thus :—

(5) $$5H_2S + 5SO_2 = 4H_2O + H_2S_5O_6 + S_5.$$

(6) $$2SO_2 \left\langle \begin{matrix} S\,Na \\ O\,Na \end{matrix} + H_2S_5O6 = Na_2S_5O_6 + 2SO_2 \left\langle \begin{matrix} S\,Na \\ O\,H \end{matrix} \right.\right.$$

sodium and thiosulphate.

(7) $$2SO_2 \left\langle \begin{matrix} S\,Na \\ O\,H \end{matrix} = H_2S + Na_2SO4 + S. \right.$$

Thus, when any acid reacts in the cold on excess of sodium thiosulphate, the principal reaction gives rise to the following bodies :—

1. *Sulphurous acid.*
2. *Sulphuretted hydrogen.*
3. *Sodium sulphate.*
5. *Sulphur.*

The secondary reactions give rise as well to small quantities of the following substances :—

1. *Sodium acid sulphite.*
2. *Sodium pentathionate.*
3. *Sodium acid sulphide.*

As these secondary reactions only proceed in the presence of extremely weak chemical affinities, they only take place after a long time, especially that of sulphuretted hydrogen on sodium thiosulphate, and many days must elapse before the limit of this reaction is reached, and sulphur is longer deposited.* This limit may be readily calculated.

II.—Action of Alum on Sodium Thiosulphate.

The alum which is employed in photographic operations, either before or after the fixing bath in order to harden the film of the gelatine plate or paper, and which is also used mixed with thiosulphate in the combined toning bath, is capable of reacting upon sodium thiosulphate in a manner independent of the aluminium sulphate which it contains. We proceed to examine those cases of this reaction which present analogy with the decomposition of thiosulphate by acids.

Action of aluminium sulphate on excess of sodium thiosulphate.—It is known that, at a boiling heat, sodium thiosulphate completely precipitates alumina from solutions of its sulphate according to the equation†—

$$3Na_2S_2O_3 + Al_2(SO_4)_3 = Al_2O_3 + 3Na_2SO_4 + 3SO_2 + S_3$$

In the cold the reaction is quite different :—

1. *Aluminium sulphate reacts at first with sodium thiosulphate, giving sodium sulphate and alumininm thiosulphate.*
2. *Aluminium thiosulphate — a very unstable substance—slowly decomposes in contact with water, giving aluminium sulphate and sulphuretted hydrogen.*
3. *Lastly, if the sulphuretted hydrogen is in presence of excess of sodium*

* Let n molecules of a bibasic acid react on $2n$ molecules of sodium thiosulphate; they give, according to equation (1), cited above, $2n$ molecules of thiosulphuric acid, which decompose, producing

$$n\,Na_2SO4 + n\,H_2S + n\,SO_2 + n\,S.$$

Of the n molecules of SO_2 produced, a part nx attacks the H_2S; the remainder, $n(1-x)$, reacts on the excess of thiosulphate. We shall then have produced by the action of $(n\,x)$ SO_2 on $(n\,x)$ H_2S, a quantity $n\,\frac{x}{5}$ of pentathionic acid (equation 6). This quantity will react on twice its weight of sodium thiosulphate (*i.e.*, $2\,n\,\frac{x}{5}$) with the production of a new cycle of reactions which terminates with the formation of a quantity $\left[n\left(\frac{x}{5}\right)^2\right]$ pentathionic acid, susceptible of decomposing $\left[2\,n\left(\frac{x}{5}\right)^2\right]$ sodium thiosulphate. The successive quantities of thiosulphate entering into the reaction thus form a diminishing geometrical progression, having for its first term the number $2\,n$, and $\frac{x}{5}$ for its common ratio.

This series

$$2\,n + 2n\,x + 2\,n\left(\frac{x}{5}\right)^2 \cdot \cdot \cdot \cdot \cdot \cdot 2\,n\left(\frac{x}{5}\right)^p$$

is not infinite; it is convergent, and has for its limit the expression

$$\frac{2\,n}{1-\frac{x}{5}} = 10\,n\left(\frac{1}{5-x}\right)$$

In effecting the same calculation for sodium thiosulphate decomposed by sulphurous acid and by sulphuretted hydrogen, as well as for each of the substances formed by the different reactions which have been mentioned, it has been possible to establish the total equation, whatever the value may be of the coefficient of "distribution," x, a coefficient which varies with the relative proportions of acid and thiosulphate, and especially with the temperature of the experiment.

This equation is as follows :—

$$n\,H_2R'' + 10\,n\left(\frac{3-2\,x}{5-x}\right)\,Na_2S_2O_3 + 10\,n\,\left(\frac{1-x}{5-x}\right)H_2O$$

Bivalent

give

$$n\,Na_2R'' + 5\,n\,\left(\frac{2-x}{5-x}\right)\,Na_2SO_4 + n\,\left(\frac{x}{5-x}\right)\,Na_2S_5O_6 + 10\,n\,\left(\frac{1-x}{5-x}\right)\,NaHSO_3$$

Sodium sulphate — Sodium pentathionate — Sodium bisulphite

$$+ 4\,n\,\left(\frac{x}{5-x}\right)H_2O + 10\,n\left(\frac{1}{5-x}\right)S.$$

Water — Sulphur

The quantity of sulphur precipitated by 1·26 gramme of oxalic acid in presence of a great excess of thiosulphate is composed between 0·80 gm. and 1·28 gm., corresponding to the respective limiting values, $x = 1$ and $x = 0$.

† Chancel.

Reeb, *Bulletin de la Société Française de Photographie*, 1894.

† This reaction is only a preliminary to the formation of trithronic acid, which is known to be produced by the prolonged action of sodium acid sulphite on sulphur.

thiosulphate, it slowly decomposes the latter, with the formation of sodium acid sulphite, sodium acid sulphide, and sulphur.

Equations:—

$$(1)\quad 3SO_2 \left\langle \begin{matrix} SNa \\ ONa \end{matrix} + Al_2(SO_4)_3 = 3Na_2SO_4 + Al_2(S_2O_3)_3$$

$$(2)\quad Al_2(S_2O_3)_3 = 3H_2S + Al_2(SO_4)_3$$

$$(3)\quad SO_2 \left\langle \begin{matrix} SNa \\ ONa \end{matrix} + H_2S = SO \left\langle \begin{matrix} OH \\ ONa \end{matrix} + NaHS + S^* \right.\right.$$

Very slow reaction.

Note.—By weighing the quantity of sulphur which is deposited at the end of a given time by the reaction of a known weight of alum on excess of sodium thiosulphate, and also the quantity obtained at the end of the same time by the action of sulphuretted hydrogen on excess of thiosulphate, we have proved that the weights of sulphur were almost identical—a fact which indicates that the two reactions are of the same order.

The preceding equations explain why it is that, when alum is added to excess of sodium thiosulphate, the smell of sulphuretted hydrogen may be detected before the liquid has deposited sulphur, since reaction (3) only takes place very slowly. As soon as it has commenced to take place, a fact which is rendered evident by the turbidity due to deposition of sulphur, the sodium acid sulphite and acid sulphide are formed. It is thus seen from equation (2) that aluminium sulphate is regenerated, and is able to react once more with sodium thiosulphrte.

Thus, theoretically, a small quantity of alum ought to decompose an indefinitely large quantity of sodium thiosulphate (2); but, in point of fact, since all these reactions take place in presence of extremely weak chemical affinities, their completion is very slow, and, in addition to this, the small quantity of bisulphite formed (equation 3) has, as we shall see later, a considerable retarding effect. Moreover, on *à priori* grounds, it could hardly be supposed that the reaction of a small quantity of sodium thiosulphate on a large quantity of alum would be limited to the production of sulphuretted hydrogen (equation 2) without deposition of sulphur.

However, as this second reaction only progresses slowly, the sulphuretted hydrogen formed would be in contact with the thiosulphate not yet decomposed, and would give reaction. (3) It is, nevertheless, noticeable that a solution of alum, treated with a small quantity of sodium thiosulphate, only gives a precipitate after a long time, and with much greater difficulty than by the addition of a small quantity of alum to excess of thiosulphate.

The above reactions explain why combined toning baths containing thiosulphate and alum deposit sulphur during a lengthy period, and yet do not lose their properties of hardening gelatine, since the sulphate of alumina is re-formed in it from the commencement, and that the bisulphite of alumina, which is subsequently gradually formed in it by the action of sodium bisulphite on aluminium sulphate, possesses the same hardening properties as alum itself.

(*d*) *Action of sulphite and bisulphite of soda in the reactions of acids and alum on sodium thiosulphate.*—Various writers have recommended the addition of bisulphite or neutral sulphite of soda for the purpose of preventing the decompositions of thiosulphate by acids and by alum.†

We have seen that bisulphite of soda neither retards nor hinders in the slightest degree the decomposition of sodium thiosulphate by acids. The neutral sulphite, however, is first transformed into the bisulphite by the acid before the latter acts upon the thiosulphate, a reaction which slightly retards the decomposition.

But the presence of these bodies, even in very small quantities, considerably retards tho action of alum on thiosulphate. This retardation can be explained as follows:—The bisulphite and neutral sulphite of soda react on alum, but are without action on sodium thiosulphate. They give bisulphite or sulphite of alumina, as the case may be, and with bisulphite of soda the change may be represented by the equation—

$$\underset{\text{Bisulphite of soda,}}{6NaHSO_3} + \underset{\text{Alum}}{Al_2(So_4)_3} = \underset{\text{Bisulphite of alumina.}}{Al_2(HSO_3)_6} + 3Na_2So_4.$$

Bisulphite of alumina is without action on sodium thiosulphate, for the latter is only affected by free sulphurous acid. As the decomposition of sodium thiosulphate by alum is very slow, it is not surprising that a small quantity of such a substance as bisulphite or sulphite of soda, capable of producing the reaction given above, should considerably retard the docomposition. We have determined the minimum quantity of bisulphite of soda required to prevent the decomposition of a given weight of thiosulphate by alum. We found this quantity was variable, according to the respective proportions of alum and thiosulphate present. Thus, if alum and thiosulphate are employed in the proportions in which they are used in combined baths, say twenty times more thiosulphate than alum, then, in order to prevent all decomposition, about one-fifth the weight of the alum of commercial bisulphite of soda (=40 per cent. bisulphite) is required. This quantity becomes less as the proportion of alum to thiosulphate increases. Thus a mixture of fifteen grammes thiosulphate and 60 grammes alum requires only about one-hundredth of the weight of the alum. We have shown above how this fact may be explained.

We may here be permitted to express our thanks to MM. Lumière, Bros., for the great assistance which they have been good enough to furnish us in the course of our work, and which has greatly facilitated our researches.

MM. Seyewetz and G. Chicandard.

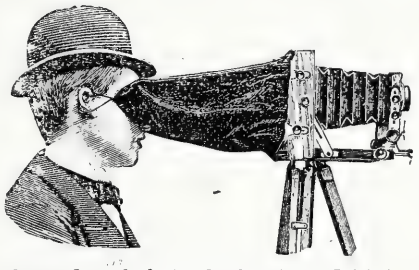
* Experiment shows that reaction is not complete, and that the quantity of sulphur deposited at about 15° C. does not sensibly increase after five days, and that it corresponds to about one-fifth of the theoretical quantity. Hence a chemical equilibrium appears to be established, owing to the presence of the sodium bisulphite, which reacts on the aluminium sulphate, and gives bisulphite of alumina without action on the thiosulphate. (See further.)

† Lainer, *Bulletin de la Société française de Photographie* 1889; Reeb, *ibid.* 1893.

Our Editorial Table.

The thirty-ninth issue of Fallowfield's *Photographic Annual and Catalogue* for 1895–6 is the largest of this series yet issued, containing, as it does, 780 pages. As Mr. Fallowfield states, all the up-to-date novelties are to be found within its pages, hence a difficulty in the specifying of its contents. It contains numerous illustrations of cameras, stands, lenses, dark rooms, changing bags and boxes, shutters, lanterns and their appliances, backgrounds, steroscopes, *et multis aliis*. The getting together of a catalogue of such magnitude displays great enterprise. Price, post free, 1*s.* 6*d.*

The Paragon Focusser.



This focusser, made by F. Beresford, 14 Bridge-road West, Battersea, S.W., enables one to focus with great ease. It consists of a flexible velvet-covered bag, which is sprung upon the camera as shown in the cut. There is a flexible mask at the end, perforated with large holes for the eyes, and, altogether, it is both simple and highly efficient.

News and Notes.

Royal Photographic Society.—Technical Meeting, at 50, Great Russell-street, on Tuesday, April 23. *The Science of Tone Rendering in Opaque Ink* (preliminary paper) by Mr. A. K. Tallent and Mr. A. W. Dollond.

Photographs of a Pretender.—The *Koelnische Zeitung* publishes the following telegram from Belgrade:—"M. Christics, the Servian Premier, has sent to all the Prefects throughout Servia copies of a photograph of Prince Karageorgevics, the pretender to the Servian throne, taken in St. Petersburg, with instructions to detain any stranger who resembles the photograph even in only a slight degree. This measure has been taken owing to fears that Prince Karageorgevics will shortly attempt to enter Servia."

The Gem Dry Plate Company, Limited, of 92, Villiers-road, Willesden Green, London, N.W., write: "We beg to announce that the 'Gem' Dry Plate Company, Limited, has now completed, at the above address, one of the largest dry-plate and film factories in England. Mr. J. B. Findlay, B.Sc., will undertake the laboratory work. Mr. Findlay is a thoroughly competent analyst, and has been engaged in most responsible positions in the chemical and photographic industries for the past ten years. Mr. T. E. H. Bullen, one of the first manufacturers of dry plates and gelatine films, will superintend the general business details."

Photographers' Benevolent Association.—Meeting of the Committee on Friday, April 5, at the Registered Offices, 6, Farringdon-avenue, E.C., Mr. Charles Faulkner in the chair.—Three applications for grants or loans were considered, two of which were referred back for further particulars, while, in the third case, a grant of 1*l.* was made to enable the applicant, a qualified operator, who had been long out of employment, to obtain plates and sundries in order to commence outdoor photography. The Hon. Solicitor, Mr. George F. Fall, reported fully on two cases in which he had been engaged. General position of the Society was very carefully discussed at considerable length. Some of the members promised to undertake further personal work in the way of canvassing in their own districts for members and subscriptions, and it was decided that the last general appeal should be made to the profession and the photographic societies. The Secretary was instructed to prepare 1500 letters for dispatch to the principal members of the profession, enclosing collecting cards and subscription forms, to make special appeal in photographic journals and to write to each of the photographic societies of the country. Unless this appeal receives a much more general response than the other appeals made by the Society, the Committee see no other alternative than to cease their work and to hand over the nucleus of a pension fund to some kindred society connected with some other branch of business.

RECENT PATENTS.

PATENTS COMPLETED.

IMPROVEMENTS IN SIGHTING DEVICES OR PICTURE-FINDERS FOR CAMERAS OR OTHER INSTRUMENTS.

No. 9103. JEAN BAPTISTE WEBER, 95, Boulevard Beaumarchais, Paris, France.—*March* 9, 1895.

In photography, sighters or picture-finders are designed to enable the operator to see, before reproduction on the sensitive plate, a reduction of the image or object which will be impressed on the finished plate. The appearance of the picture shows the operator how he must place his camera.

The clearer and more accurate the reduced image, the more valuable the service rendered by the sighter or picture-finder, by reason of the increased facility of procuring the most suitable aspect and selecting the point of view which will result in the production of the most harmonious and artistic negative.

The sighter or picture-finder which will yield the best results in this respect is that in which the image will be presented to view exactly as it appears naturally, *i.e.*, in a right aspect and in its true proportions, without inversion or distortion.

It is to obtain this result that I have invented the sighter or picture-finder which forms the subject of this application.

This device is essentially constituted by two mirrors or polished surfaces reflecting the image in full daylight, and comprises two parts joined by a hinge and of which one is attached to the camera by any suitable fitting, such, for instance, as a slide. A mirror is placed on the bottom of this fixed piece. The movable part carries a diminishing mirror, hereinafter referred to as the movable mirror, with a suitable convex reflecting surface, the dimensions and radius of curvature of which are proportioned to the field of the object-glass.

The image given by the movable mirror would be reversed laterally if regarded directly. The fixed mirror, which has a concave reflecting surface, is intended to correct that reversion and magnify the diminished picture. This fixed mirror may also, if necessary, have a plane reflecting surface; but I have found it more advantageous to use a slightly concave mirror, for the purpose of slightly enlarging the picture, and, in a certain degree, compensating for any slight distortion produced by the convex or movable mirror.

These two mirrors may consist either of metallic reflectors or plates of glass, having one of their surfaces covered with a metallic film or a coat of black or very dark varnish.

The relative positions of the two mirrors depends upon the angle at which the right image must be directed to meet the eye of the operator. When the visual ray is nearly perpendicular to the fixed mirror, which is in general the case of most frequent occurrence, the most favourable position for the movable mirror is that in which its plane forms an angle of about 30° with the vertical plane behind it (passing through the hinge); it would, therefore, be inclined forwards, towards the ground. The fixed mirror will then be placed slightly in advance of the vertical plane above mentioned, and inclined forwards and upwards at an angle of from 5° to 10° with the horizontal plane.

According to my experience, the following construction and arrangement of mirrors are the most advantageous. The movable mirror is made of a plano-concave lens, having its concave surface silvered, so as to make a convex reflector, whereof the radius is equal to about ten or twelve centimetres. The fixed mirror is also glass and plano-concave, its radius of curvature being from eighteen to twenty centimetres, or even more. This glass may be dark-coloured, or, if transparent, its plane surface is covered with a coat of black varnish, so that the concave surface may become the reflector. The mirrors may be permanently fixed upon the camera, or placed on a suitable stand in a box opening sufficiently to permit of the double reflection of the image.

For the purpose of limiting the opening of the box, a slotted bar, in which a small stud fixed to the movable part slides to and fro, is jointed on a pivot secured to the fixed part. A stop behind the hinge may also be used, in lieu of the slot and stud, to limit the opening of the box.

It is to be understood that I reserve to myself the right to substitute for the said stop, or slot and stud, any other mechanical equivalent effecting the same object, such as a spring, a blade with catch, &c.

In order to facilitate the adjustment of the picture to the sensitised plate, lines—vertical, horizontal, or oblique—may be drawn upon the movable mirror. If the latter is square, and carries diagonal lines, the operator will be enabled easily and quickly to decide, by an inspection of the reflected image when formed, whether it would be better for him to take it with the plate horizontal or vertical.

A sighter or picture-finder, made to be used with a camera of given dimensions, may also be used with cameras of smaller size. It would suffice to place in front of the movable mirror, and there to secure it by any convenient means, such as tourniquets or buttons, a blackened frame intermediately superimposed, leaving open in the centre of the mirror only the necessary opening corresponding to the smaller-sized plate. There may be several such frames, with different openings, in series, and placed in a groove or slide made by saw cuts in the cover of the sighter or picture-finder.

If, for example, in a sighter made for photographic plates 18×24 the radius of curvature of the movable mirror is calculated to give the necessary field with a mirror of which the side is forty-four millimetres, then a blackened frame of the same external dimensions, and having a square central opening of which the side is from thirty-six to thirty-eight millimetres, will be applied to the mirror when the plates to be used are 13×18. The opening will be only thirty or thirty-two millimetres square for 9×12 plates.

For other kinds of plates the dimensions of the side of the interior square, which will give the necessary field, may easily be calculated.

In order to guide the operator in determining whether to place the plate for a vertical or for a horizontal picture, the stop frame may have small squares or angles with a side of from three to four millimetres fitted into the corners.

I reserve to myself the right of adapting my improved sighter or picture-finder for use not only with all kinds of cameras, but also with all optical instruments, and other instruments of precision, whereof the employment may be facilitated by my invention.

IMPROVEMENTS IN PHOTOGRAPHIC VIEW-FINDERS.

No. 9119. HENRY HILL, 151, Fentiman-road, Clapham, London, S.W., and ARTHUR LEWIS ADAMS, 81, Aldersgate-street, London, E.C.—*March* 9, 1895.

THIS invention relates to improvements in photographic view-finders, and has for its object the better definition or clearer view of the object or objects seen upon the ground glass or celluloid screen, such as is usual in view-finders used upon or in hand or other cameras.

The method of constructing our improved view-finder is as follows:—

In front of a mirror of small area (placed at angle of 45° to the axis of the lens of the camera) we place at half its focal distance a double convex lens of short focus, the axis of this lens being parallel to the axis of the lens of the camera, and then we place a plano-convex lens of short focus and large diameter joining the upper end of the mirror, and subtended over it at an angle of 45°, the whole being enclosed in a case of wood, metal, or other suitable material to exclude extraneous light, and, to get views proportionate to various sized sensitive plates or films upon a given size plano-convex lens, we interpose between the double convex lens of the finder and the mirror a plano-convex lens of small diameter and short focus, whose axis is coincident with the finder lens.

By these means we are enabled, by looking down upon the convex surface of our plano-convex lens of large diameter, to get a perfectly clear and distinct view, and, by covering our plano-convex lens of large diameter with a mask of metal or other suitable material, having an opening proportionate to the size of the plate or film for which the finder is to be used, corresponds with that thrown by the lens of the camera upon the sensitive plate or film in the camera.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS FOR INSTANTANEOUS OR TIME EXPOSURES.

No. 9139. ARCHIBALD GOWAN CAMPBELL, Southwell House, Southwell-gardens, South Kensington, London.—*March* 9, 1895.

THIS invention relates to improvements in photographic cameras on the reflecting principle, in which the image is seen full size, and can be focussed up to the moment of exposure. In my camera only one lens is used, and the mirror is hinged and actuated by the torsion of a spiral spring or equivalent means.

The exposure begins to take place immediately the mirror commences to move, and is finished when the mirror completes its motion. The press button or actuated part merely serves to release the mirror from its held position, covering the "sensitive" surface before the exposure, at an angle of, say, 45° to it. One end of the axis of the mirror projects on the outside of the camera, and enables the former to be returned to its original position after the exposure has been made. The other end, in the form of a sleeve, projects on the other side, and enables the torsion of the spiral spring to be increased or diminished by rotation of the projecting part, which is connected to the abutment end of the coiled spring.

Another and alternative method of regulating exposure is to attach a plunger with piston either to the mirror and its supports inside the camera, or to a lever or part attached to the spindle outside, with a vent hole of variable area. In this case the sleeve may be dispensed with, the torsion of the spring being adjusted once for all, and the regulation effected entirely by alteration of the air vent of the piston or chamber. Several alternative methods of attaching the shutter to the mirror may be adopted, but one of the simplest dispenses with all additional hinges, rollers, bearings, or flexible material, and is preferably made not to touch any part of the camera during its upward movement. This arrangement embodies a flap rigidly fixed to the base of the mirror with an intervening slit (wide enough to expose the whole plate at once for time exposures); the flap may, but need not necessarily, be curved, and such arrangement has, besides its mechanical advantages, an important photographic one, viz., the plane of the aperture is approximately in the plane of its motion, so that during the first part of the exposure, when that motion is comparatively oblique to the rays of light, the aperture is similarly oblique, and therefore in effect narrowed.

This is of advantage, photographically, as the sky should receive equal or even less exposure than the foreground, and, if the angular velocity of the mirror be constant with this arrangement, the exposure of the plate will be approximately uniform, and the amount and range of "cushioning" may be adjusted so as to make this velocity so constant.

A folding hood on the top or other part of the camera is made, with an aperture to admit the eyes and nose of the operator, and of such a shape that, when his face is in position, light is excluded from the ground glass or focussing screen. This serves two purposes—(1), To enable the image to be seen distinctly in the brightest sunlight, or under like trying conditions; and (2), To prevent light from getting to and through the ground glass while the mirror is moving upwards, thus rendering it impossible to "fog" the plate thereby.

The apertures closed by the face of the operator may be provided with magnifying lenses.

For time exposures the mirror may be held half way up by a suitable catch. When so used, I either close the hood, or I provide means easily actuated for closing the aperture in it when the face is removed.

In the latter case I have, say, a flap, held by a spring against the aperture, and pushed out of the way by the bridge of the nose when the face is placed against it.

The square or other aperture exposed by the motion of the mirror should be large enough to admit light up to the edges of the sensitive plate, even when the lens is moved (in focussing near objects) to its farthest position from the sensitive plate.

The lens may be moved along its axis (for focussing) by a rack and pinion, or

equivalent means, which may be fixed either to the lens direct or to the front of the camera carrying the lens.

Except for portraits (time exposures), cameras are seldom required to take vertical "hand" pictures. There is, however, no difficulty about doing so with this instrument, positioning the head and body accordingly, or an ordinary "finder" may be employed, the hood being closed, or a reversing frame may be used.

The plates may be changed in any suitable or convenient manner.

This arrangement of camera may be used with ordinary dark slides or roller slide, or it may be made on the magazine principle, adapting the camera accordingly.

The mirror may be mounted on metal (say aluminium) arms.

By these means the following, amongst other advantages, may be attained :—

1. Simplicity.

2. Advantage of a double support by both face and chest, ensuring steadiness, and enabling much longer exposures to be given, without shaking, than in ordinary hand cameras.

3. Easy method of setting for time exposures with a single catch.

4. The exposure commences as the image is disappearing from the ground glass, the exposure is finished before the mirror is stopped, thus avoiding vibration from the change of motion.

5. The mirror may be mounted in the lightest possible way so, that its motion even when rapid is not imparted to the camera, at least until the exposure is finished.

The mirror as it reaches the top encloses a body of air which forms a cushion and enables rapid exposures to be made without jar or risk of breaking the glass.

This cushioning also tends to correct any tendency which the mirror may have to accelerate its motion.

6. The pressure to release the catch holding the mirror is parallel to the axis of the lens and towards the operator's body, so that the spring holding it, and therefore the mirror, in its place may be made of considerable strength.

This is important, because any "play" in the mirror spoils the focussing adjustment, and there is also less chance of letting it off accidentally or of its getting out of order.

7. The increased facility for readily regulating the exposure.

Considerable variations may be made in the details of the arrangements without departing from the essential features of the invention.

An Improved Apparatus for Enlarging and Reducing from Photographic Negatives.

No. 14,446. Courtney Spencer Jones, "Firleigh," Woodford Green, Essex. *March*, 9, 1895.

The object of this invention is to simplify the process of enlarging and reducing from photographing negatives by dispensing with the necessity of focussing.

This is accomplished by providing a light-tight box of suitable size with a series of grooves for the reception of two slides, one containing the lens and the other the sensitised plate or paper. These grooves are accurately adjusted according to the focal length of the lens, and each one bears a distinctive number, letter, or other indication by which its relation to the other grooves can be easily determined by reference to a printed key supplied with each apparatus.

Or, instead of providing grooves, the positions to be occupied by the respective slides can be indicated on the camera, and the slides made in such a manner as to admit of their occupying those positions without the aid of grooves ; but I consider the use of grooves preferable to this arrangement.

The mode of procedure is as follows: If it is desired, for example, to enlarge from a quarter-plate negative to whole-plate size, the negative is placed in the carrier in front of the camera. The key is then referred to, which gives the numbers of the grooves into which the respective slides must be placed to accomplish this. The slides are then placed in the positions indicated, the lid of the camera fastened down, and the exposure made.

A similar mode of procedure is adopted for reductions.

In consequence of the slide containing the sensitised plate or paper having to be placed in different positions in the camera according to the size of enlargement or reduction required, the ordinary form of dark slide is unsuitable for use with this apparatus, and I have therefore devised a new and more suitable form of slide. It is so constructed that, in whichever groove it is placed, the front can be lifted for making the exposure notwithstanding that the top is securely fastened down. This is accomplished by making a hinged front flap to the slide in such a manner that, when a cord communicating with the outside of the camera is attached to the front flap, it can be pulled from the outside, thereby raising the flap and exposing the sensitive plate or paper. The cord can be secured so that the flap may be kept raised for any length of time. On releasing the cord, the flap springs back to its original position.

Provision is also made for securing the sensitive paper or plate in its proper position in the slide.

The form of dark slide just described is not absolutely necessary to the successful working of the apparatus. An alternative method of making the exposure, which necessitates the taking of the whole apparatus into the dark room whenever a sensitive plate or paper has to be inserted or removed, is as follows :—

A flap or sliding shutter is made to work behind or in front of the negative in such a manner that the light passing through the negative can be cut off when not required. The sensitive plate or paper is secured to a plain slide made of wood or other suitable material. This and the lens slide are then placed in their proper positions in the camera, and, after the lid has been securely fastened, the whole apparatus is taken into the daylight and the exposure made by raising the flap or withdrawing the sliding shutter as the case may be. This apparatus can be used with artificial light as well as with daylight if desired.

Among the advantages which this camera possesses over others of a similar character may be mentioned the following :—

(1) That each camera is capable of making a number of different sized enlargements, or of making reductions from different sized negatives, with a minimum of trouble and without the necessity of having a separate apparatus for each sized enlargement or reduction required.

(2) That by the aid of the dark slide already described the necessity for taking the whole apparatus into the dark room to insert or remove the sensitive plate or paper is obviated.

Improvements relating to Doublet Lenses for Photographic Purposes.

No. 21,458. Carl Paul Goerz, 7a, Haupstrasse, Schöneberg and Emil von Hoegh, 60, Prinzregentenstrasse, Wilmersdorf, both near Berlin, Germany.—*March* 9, 1895.

Our invention relates to photographic doublet lenses or objectives, which are corrected for spherical, chromatic, and astigmatic errors.

In the Specification of former Letters Patent granted to us, dated December 19, 1892, and numbered 23,378, we described a double objective, the two separate systems of which were spherically, chromatically, and astigmatically corrected, each for itself, and were to this end made up each of three cemented lenses, of which one cemented surface converged the rays of light (to compensate the astigmatic error), and the other cemented surface caused the rays of light to diverge (for the purpose of compensating the spherical error), these two systems being further composed either—

(*a*) Of a negative lens, enclosed between two positive lenses, of which one had a higher and the other a lower refractive index than the negative lens so enclosed ; or

(*b*) Of a positive lens, enclosed between two negative lenses, one of which had a higher and the other a lower refractive index than the positive lens so enclosed.

With the object of obtaining as great and equable sharpness of field as possible, this separate combination of the separate lenses was further varied by cementing together in combination two identical lenses (either positive or negative) with a third (negative or positive respectively). The only condition to be fulfilled was that in each several case the characteristics of the combination should correspond with those laid down in the first claiming clause of the specification of our said former patent, viz., that of the two cemented surfaces, the one should act by converging the rays of light, and the other by diverging them, and the two similar lenses should possess, the one a higher, and the other a lower, refractive index than the differently figured third lens.

According to our present improvements, the two separate systems of the double objective are made up of a negative lens of medium refractive index, cemented to two positive lenses placed in juxtaposition with each other, one of these latter having a higher and the other a lower refractive index than the negative lens which lies outside, or of a positive lens of medium refractive index, cemented to two negative lenses placed in juxtaposition with each other, of which one has a higher and the other a lower refractive index than the positive lens which lies outside.

Each separate system, may, however, be used independently as a photographic objective, since each is independently corrected for spherical, chromatic, and astigmatic error.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
22	Camera Club	Testing Lantern Slides.
22	Lantern Society	
22	North Middlesex	
22	Putney	
22	Richmond	Open Discussion.
23	Birmingham Photo. Society	*Orthochromatic Photography.* Hall Edwards, M.R.C.S., L.R.C.P.
23	Croydon Microscopical	*Fair Isle Scenes and Fair Isle Folk.* Ernest Straker.
23	Hackney	Smoking Concert.
23	Newcastle-on-Tyne & N. Counties	*On the Choice of Subject.* James Brown.
23	Paisley	
23	Rochester	
23	Royal Photographic Society	*The Science of Tone Rendering in Opaque Ink.* A. K. Tallent and A. W. Dollond.
24	Bath	
24	Burnley	
24	Croydon Camera Club	*Photography by Flashlight.* Messrs. White and Smith.—*Portraiture with the Incandescent Lamp.* D. Waller.
24	Leytonstone	
24	Newton Heath	Social Meeting.
24	Photographic Club	*Snowed-up in the Rockies.* M. L. Troup.
24	Southport	Lantern Night.
25	Birmingham Photo. Society	Last Day for sending in Entry Forms for Annual Exhibition
25	Camera Club	Mr. Leon Warnerke. Description of his Method of Photo-etching Printing Demonstration.
25	Dublin Y.M.C.A. Camera Club	Annual Business Meeting.
25	Ealing	Discussion: *Outdoor Notes.*
25	Glossop Dale	
25	Halifax Photo. Club	
25	Hull	
25	Ireland	*A Short Holiday.* A. M. Geddis.
25	Leigh	Social Evening.
25	Liverpool Amateur	
25	London and Provincial	Open Evening.
25	Oldham	
25	West London	*The Slide Rule—Applied to Photography, Exposure Meters, &c.* G. E. Varden.
25	Woolwich Photo. Society	Lantern Night.
26	Cardiff	
26	Croydon Microscopical	*After-treatment of Platinum Prints by Packham's Process.* J. Packham.
26	Holborn	
26	Maidstone	
26	Plymouth	Lantern Evening.
26	Swansea	
27	Hull	
27	Leytonstone	Excursion: The Hollow Ponds. Leader, Mr. Battle.
27	Liverpool Amateur	Excursion: Hoylake and Hilbre Island. Leader, Mr. Norman-Thomas.

ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 9,—Ordinary Meeting, Mr. G. Scamell (Hon. Treasurer) in the chair.

It was announced that several members had been admitted by the Council as Fellows.

A number of applicants for membership were balloted for, and duly elected.

A paper entitled *Notes on the Hurter & Driffield System of Speed Testing*, by Mrs. Acworth and Dr. J. J. Acworth, was read. A brief discussion followed.

APRIL 16.—Photo-mechanical Meeting.—Mr. E. J. Wall in the chair.

The CHAIRMAN announced that this was the first of the meetings specially devoted to photo-mechanical processes by the Society, and welcomed in the name of the Society the visitors present, who were very numerous.

Mr. Bolas was unable to read the paper announced on *Historical Notes on Photo-mechanical Progress*.

Mr. SNOWDEN WARD opened a discussion upon Ideal Half-tone Printing. He said, in his opinion, the elaborate making up of blocks for printing was often a mistake, and that the first hand-pulled proof of a block was generally the best. Half-tone work on bad paper had, of late years, improved more rapidly than half-tone work on good paper. Until recently, the British printer had some cause for complaint: the best papers for half-tone work were hardly on the English market, and were dear; but, latterly, paper in every way suitable for the work was comparatively cheap, and, in his opinion, our best paper was well ahead of but too much of the work put on it. Another of the difficulties met with by the English workers lay in the electrotyping.

Mr. W. GAMBLE thought that there was a future in the direction of intaglio work for the acme of half-tone printing. If a mechanical grain could be given to a photogravure plate, it could be printed in a machine, and would be the ideal of half-tone work.

Mr. J. C. SUNDERLAND could confirm what Mr. Snowden Ward had said. He did not hold up American work as a paragon, but British printers, as a rule, did not get off one-fourth the impressions that should be pulled from a block. He put much of the blame for bad blocks upon bad, flat photographic originals. The greater the contrast in black and white in the original, the better the result.

Mr. W. England passed round two examples of half-tone negatives on dry plates, also a screen, 150 lines to the inch, prepared photographically on a celluloid film.

Mr. W. T. WILKINSON ascribed much of the bad half-tone work to hurry, both in the manufacture of the paper itself and afterwards.

Mr. CARTER said the American rollers were made by filling the moulds by hydraulic pressure from below rather than by pouring from the top. In consequence, the rollers were much freer from air-bubbles.

The CHAIRMAN thought blocks were made in too great a hurry and the printers were not given enough time generally to turn out the best work. He generally got better blocks when he supplied the process-workers with transparencies than when they had to be made from prints.

Mr. SNOWDEN WARD, in reply, said inequality was the worst and commonest fault. If we could not get equally good results, we ought to strive to get equally bad ones.

Croydon Camera Club.—Mr. J. PACKHAM demonstrated and explained to a crowded assembly of members, on Wednesday, April 10, the procedure necessary for obtaining various warm colours by means of the catechu toning process, of which he is the inventor. The process in question is one whereby a remarkable and beautiful range of browns can be with much ease and certainty imparted to the cold black or grey and white prints obtained upon various kinds of platinum printing papers. Without entering into details, which have recently been fully published in the Transactions of the Royal Photographic Society, enough that Mr. Packham showed, by means of platinotypes furnished him by the President and by Mr. Richard Keene, that the process is one which very readily and satisfactorily does all that is claimed for it. He also explained a further improvement which he had made in the employment of his toning solution by the adoption of a soap clearing bath. Although this last is not always called for, in cases where perfect purity of the whites is needed it is of considerable value. In a bath, composed of forty grains of Castile soap powder and eighty grains of bicarbonate of soda to each pint of water, heated to 180° Fahr., place the prints for five or ten minutes. A fine assortment of framed photographs, toned by the above means, was exhibited, and included prints by Messrs. B. Gay Wilkinson, R. W. Robinson, Richard Keene, George Corden, Hector Maclean, the lecturer himself, and several other photographers. Replying to a cordial vote of thanks, proposed by the President, and seconded by Mr. J. T. Sandell, Mr. Packham stated that his interest in photography was originally evoked by the Croydon Camera Club, and it was therefore greatly due to the Club that he had been led to investigate, and so far perfect, what others had described as a very important improvement in photographic procedure. Mr. H. Foster Knight was elected a member, and several other nominations handed in.

Hackney Photographic Society.—April 9, Mr. R. Beckett presiding.—Mr. W. FENTON-JONES gave a lecture on *Ellan Vannin*, illustrated by a number of views taken in the Isle of Man by himself, Mr. L. S. Wilks, and Mr. J. J. Westcott.

FORTHCOMING EXHIBITIONS.

1895.		
April 30–May 4	*Eastbourne.	J. J. Hollway, 11, Hyde-gardens, Eastbourne.
May 6–11	*Birmingham.	C. J. Fowler, 2, High-street, Birmingham.
June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

REVERSAL OF THE IMAGE IN GELATINO-CHLORIDE PAPER.

To the EDITOR.

SIR,—I send you a print that may interest you. It is on gelatino-chloride paper, a print that was accidentally left in the frame until it had become bronzed like an old albumen print—a thing I had never seen previously with gelatine. So I left it and again forgot it for some days, when it had assumed the appearance of an even tone, as if the paper had been simply exposed to light without the intervention of a negative. But at a certain angle you could see an image (a negative image), by reflection at least, in different shades or grades of bronzing; but only by reflection. Then I took it out of the frame and left it, forgotten for a day or two, fully exposed to light on the worktable, with the result you see.

Now, as you will see, there is a perfect positive image, obscured only by a sort of white "fog." The print has laid for about a fortnight freely exposed to light under a window in the workroom. Can it be a case of "reversal," such as we hear of in connexion with negatives? If so, why does not the whole surface show the reversed action?—I am, yours, &c.,

GEL. CH.

REVERSAL OF THE NEGATIVE IMAGE.

To the EDITOR.

SIR,—In your issue of April 5 there appeared a short article on "Solarisation," which reminded me of an experiment that I performed several months ago.

I exposed an Ilford White Label (medium rapidity) plate behind a negative to the light obtained by burning eight inches magnesium ribbon, distant from the plate about one foot or less.

On developing with quinol for some time, a negative was obtained. The shadows were not so clear, however, as in the original negative, and some of the detail in the shadows not distinct.

A print taken from this negative was almost equal to one from the original, with the exception of the parts in shadow, while, of course, the positions as regards true right and left were reversed.

I am not an authority on the subject, but might not this process, in a much more perfect state, be employed in producing reversed negatives for certain photo-mechanical processes?—I am, yours, &c.,

Schoolhouse, Invergowrie, Dundee, April 9, 1895. DAVID PATERSON.

PROCESS WORK. A WORD TO THE WISE.

To the EDITOR.

SIR,—Some of the photographic papers, are urging forward the professional photographer to embark in process work, either half-tone and line engraving or collotype work.

My intention in writing this letter is to point out that the salvation of the professional photographer will not be found in the much-vaunted field of process, more especially as process does not offer a field for photographers with limited capital, and is essentially a business that requires both a large capital and an extraordinary amount of energy and perseverance on the part of both workers and capitalists.

The photographic papers have urged process with all the enthusiasm of fanatics, and, while giving the writers of the articles all credit for their honest intentions in endeavouring to lift the photographer from the slough of despond into which they seem to have fallen, yet I say they are mistaken.

I do not say that process offers no inducements, or that there is not plenty of work of a sort to be obtained; but this I do say, that the supply is more than equal to the demand, and competition is extraordinarily keen.

In last week's BRITISH JOURNAL OF PHOTOGRAPHY I notice a cutting from *Process Work*, the medium of Messrs. Penrose, stating "that we heard recently of an order for half-a-million collotype prints going a-begging for want of some firm to take it up." I also heard of this order, and the reason why it was refused by more than one English firm was that the price was too low to show any profit, and consequently was declined.

Process Work thinks lithographers might turn their attention to collotype work, but this remark will only cause practical collotype workers to smile, as they know the intricate working of this most-easy-in-theory and difficult-in-practice process.

As to half-tone engraving, there are representatives of German houses at present in England seeking work at 6*d.* per square inch, and for any important work will even quote lower than this.

I. am a practical collotype worker and manager of works, and I would warn those about to embark in collotype printing that unless they are prepared to lay down expensive machinery, engage competent workmen, and be satisfied with a very small profit on three years' turnover, they

will not be of any use in the field of collotype; while as to half-tone and line photographic engraving, if they can compete with the German houses, and at the same time expend about three times the amount of business energy and determination usually shown in their own business, then, and only then, will they be able to compete with the present process houses.

To those who are not in the know respecting the profits of photo-engraving, we may say it would pay much better to do cabinet portraits at 5*s.* the dozen than to attempt half-tone work at 6*d.* per square inch. The professional photographer taking up process would find his profits on a very different scale to that shown on his studio and ordinary portrait business, and I am in a position to state that two well-known process houses, during the last few years of their existence, have not made a profit of five per cent. per annum, and the manager of one of these businesses informed the writer last week, that as to their collotype department, owing to the erratic nature and uncertainty of the process, and the loss occasioned by the many returned views, and consequent replacing of same, the firm was seriously thinking of abandoning collotype.

As an antidote to the writings of the process fanatics, this letter may be of some use, and thinking same may cause some of those who are thinking of embarking in process to pause, and well weigh matters over, —I am, yours, &c., PRACTICAL.

April 16, 1895.

ALLEGED PLAGIARISM.

To the EDITOR.

SIR,—I was never more astounded in my life than when I read Mr. Harding's letter in your issue of April 12, accusing me of being guilty of the miserable and contemptible practice of plagiarism. So grave a charge cannot be allowed to pass without notice, and I therefore, with your kind permission, take this, the first, opportunity of giving it a most emphatic denial. *At the time of penning the article for "Scraps" I had never seen the book which Mr. Harding accuses me of plagiarising, the first time I opened its pages being the afternoon of April* 10, when I bought a copy from Adams & Co. in the Charing Cross-road. I am, at the moment of writing, away from all opportunities of reference, but my article was submitted to the Ilford Company early in the year, as no doubt they will inform you. Let me repeat, in the plainest and most unequivocal possible terms, that every word of advice given in my article, whatever may be its value, is entirely and absolutely the result of my own practical experience, and nothing in the article has been in any way suggested or inspired by anything contained in Mr. Harding's *Snap-shot Photography*.

To those who know me I doubt not my bare denial will suffice—it may be otherwise with Mr. Harding. He may want further proofs of the accuracy of my statements. He will be able to obtain them from the following sources. The small camera, $3\frac{1}{4} \times 3\frac{1}{4}$, *was purchased from Perken, Son, & Rayment in the early summer of* 1894. My lantern was specially fitted with a long adapter for a Ross' eight-inch lens for enlarging by Mr. Chatham Pexton about the same time. The series of negatives taken during last summer's vacation are still in my possession, and are open to Mr. Harding's inspection. I never venture to advise any special method of working until I have practically convinced myself of its utility. The article in *Scraps* was, as it professed to be, the result of my own experience, and I think any unbiassed person bearing the foregoing facts in mind would acquit me of any attempt at plagiarism, even had I read Mr. Harding's book (which I had not) before I wrote my article.

No statement or charge can be more damaging to a writer than the one which Mr. Harding has brought against me. I trust he will see his way, after reading this letter, to acknowledge his error in as public a manner as that in which he made the charge.—I am, yours, &c.,

The Baths, Bonchurch, Isle of Wight, JOHN A. HODGES.
April 14, 1895.

SUGGESTIONS IN CONNEXION WITH GELATINO-CHLORIDE PAPERS.

To the EDITOR.

SIR,—In reference to the article on the above subject by Mr. W. B. Bolton in the issue of the 5th inst., we certainly think that many of the suggestions therein named are well worthy the consideration of manufacturers.

We must confess, however, we are not so sanguine as Mr. Bolton in believing that a general introduction of printing-out papers, cut slightly smaller than the size of the plate (in order to avoid the trouble and waste incurred by trimming), would ultimately do away with the demand for papers cut to the full size of the plate. On the contrary, we rather fear this would tend to permanently increase the variety of sizes, already too numerous.

We think it is the duty of both manufacturers and purchasers to consider not only themselves, but the photographic dealer as well. Already there are many sizes of paper in use, some of which are rarely asked for, but all of which have to be stocked by the dealers in order to meet the immediate demands of their various customers. This necessitates a considerable amount of capital being locked up in stock, and, if we are now to manufacture an additional lot of sizes, this will mean further expense in more ways than one to both manufacturer and dealer.

Matters would be much improved for all concerned were there four sizes, and, if photographers would only dispense with some of the odd sizes, and confine themselves to quarter, half, and whole-plates, we then think there would be better opportunity for the manufacturers to adopt Mr. Bolton's reasonable suggestions.

It is our intention, as far as possible, to minimise the number of sizes of printing-out papers by not advertising such odd sizes as 5×4 and 10×8; but, in view of the vast number of hand cameras quarter-plate size, we feel there should be a large demand for a paper cut 4×5, and so propose including this in our list.—We are, yours, &c.,

WELLINGTON & WARD,
Manufacturers of Photographic Papers.

Elstree, Herts, April 8, 1895.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—Your writer "Omega," and your contributor "Cosmos" who has so often supported this Association, are possibly both unaware of the fact that the Association was originally started on exactly the lines to which they now suggest that it should return. Although the Association was very influentially supported and was started under the most favourable-seeming auspices, it was found impossible to obtain anything like a general support and recognition from the profession. Local secretaries were appointed, and by means of meetings, letters and articles in the press, &c., a great amount of publicity was given; but, after many years' experience of the system, the founders decided that it was impossible to carry on the Association on the basis of a benefit society. They then arranged that grants should only be made on the recommendation of a subscriber of 1*l.* 1*s.* and this would have worked satisfactorily but for the fact that there were so few subscribers, and that those who did subscribe never seemed to have friends in necessity. In order that the fund might exercise its intended character of benevolence at all, it was found necessary when an outsider applied for assistance for any one of his acquaintance to point out the rule, and this led naturally to the outsider subscribing a guinea in the sure and certain hope that if the case were any good he would receive ten guineas in return for the object of his benevolence. Such a method was finally condemned by the Association, not without very long and serious discussion, and it was decided that, as the Society to exist at all must be a "Benevolent" Society, it was best to throw open the doors as widely as possible, and grant relief to any necessitous case. Apart from the actual experience of those who for several years tried to run the "Benevolent" as a friendly society, there are certain considerations which would lead one to expect that such a course would not be successful, highly desirable though the Committee and every one must admit it to be.

If it is to be a benevolent society, it must be on a business basis, or, as "Cosmos" says, must dispense its benefits "in accordance with actuarial calculation." There are great difficulties in the way of such a course, the principal one being that the cost of obtaining members, and still more the cost of collecting the regular sums which are necessary to provide any reasonable advantage, are so great that members would be able to obtain greater advantages at smaller cost from existing friendly societies. There would seem to be no advantage whatever in attempting to compete with these existing bodies, which are open to photographers as much as to any other working men, and which offer the advantages (in many cases) of strong and able organization, ample accumulated funds, and sufficiently large membership to secure economical working. If the majority of photographic assistants belonged to an existing benefit society, there would be but little need for the "Benevolent." If all men were wise, strong, and noble, there would be little need for benevolence at all. Unfortunately we have to face the fact that many photographers do come into difficulties, and, while it is true that those who appeal to the benevolent are the less competent, this is what must be expected in all cases, and, if I understand the intention of benevolence aright, it is to help those who need it, and not those who are independent. Your correspondent "Cosmos" speaks of benevolence which "saps self-reliance and independence, and is a sure creator of paupers, idlers, and spongers." I regret that we have not the assistance of "Mr. Cosmos" on the Committee, for I am sure that he would recognise the difficulty that an idler or sponger must have in obtaining a grant or loan. He would also gather that the dealings of the Committee even with those who are undoubtedly good cases are not by any means such as to cause the unfortunate applicants to wish to be frequently on that list. There are members on the Committee who have served for years, and who are most anxious to give way to newer blood. They invite every possible suggestion, and, if "Mr. Cosmos," or "Omega" is willing to take a seat on the Committee, I am sure that we can find one for him immediately. A real and practical interest in the Association is what the Committee has long been striving to arouse, and nothing would give them more pleasure than to find half-a-

dozen practical business men who would be willing to take a part in their work and deliberations.—I am, yours &c., H. SNOWDEN WARD, *Hon. Sec*, 6, *Farringdon-avenue, London, E.C., April* 11, 1895.

A HARD CASE.

To the EDITOR.

SIR,—The formation of a Photographic Assistants' Union, as suggested by "Assistant," to deal with such instances of injustice as I described under "A Hard Case," was attempted a few years ago. A full account of the affair can be found in the JOURNAL for 1889-90. This attempt was headed by Mr. Arthur G. Field, and failed mainly through the indifference and non-support of assistants themselves, and I think that a fresh effort to start a union at the present time would likewise fail. Before a union can be formed there must be some general interest, binding obligation and common ground of fellowship amongst assistants, which cannot at present be said to exist. This being so, I have drawn up a scheme which I think would meet the case without going to the extremity of forming a union and taking up a position of antagonism to employers generally. My object has been to discriminate between the good and bad employer, and to avoid making enemies of men who are anxious to treat their assistants in a fair and humane spirit. Any photographic assistants, including the women workers, interested in such a scheme, or having an earnest desire to remedy cases of gross injustice, will, on application to my present address, be supplied with full details. I will also supply the name of the sweating firm I mentioned to any serious applicant, and, if necessary, names and addresses of those who will bear me out in the statements I made.—I am, yours, &c.,

118, *Cregoe-street, Birmingham.* JOHN A. RANDALL.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Frederick William Broadhead, Leicester.—*Portrait of Mr. Samuel Turner.*

Frank Coghlan, Londonderry.—*Three portraits of the Most Rev. Dr. O'Doherty, Bishop of Londonderry.*

Alexander Johnston, Wick.—*One photograph each—Engine ready to charge a snow-drift; Engines stuck in the snow; Digging out the snow-plough; Snow-cutting, showing four lifts; Three engines and snow plough charging a five-feet snowdrift.*

H. S. S.—Will appear next week.

J. S. P.—B. J. Edwards supplies both the films and the screens.

ENLARGER.—Send us a detailed account of your method of proceeding, and we will probably be able to discover the cause of your failure.

TELE-PHOTO asks if any reader knows of or has tried any reliable tele-photo lens that will take life-size portraits direct. In reply to other queries, a portrait lens working at full aperture will be best.

R. ROACH.—Better send us a negative—a fair average one—to see. We fancy the trouble is over-exposure. If so, it may, to an extent at least, be remedied in the development of the remainder of the plates.

C. PAYNE.—If the carbon print has partially separated from the copper before the etching, it will be useless to proceed further with the work. There is no effectual way to fix the film on again when it has once left the metal, but it is easy to make a fresh print.

F. W. HOWELL says: "Can you let me have the address of the patentee of the carbide of calcium cylinders, on which you have had some very interesting articles during the last few weeks?"—We do not know the address. Some reader may be able to supply it.

J. E. asks: "Will you kindly tell me what amount of carbonate of soda (crystals) is the equivalent of two minims of ammonia ·880?"—In reply, one minim of strong ammonia ·880=6·235 grains of carbonate of soda, hence the quantity required would be, roughly, 12½ grains.

TYRO says: "Will you please give me a formula for making developed enlargements?"—We presume you want a developer for bromide paper? If so, we refer you to THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC, in the formulæ pages of which you will find what you want in great variety.

A. BIGGS.—The yellow patches are due to imperfect fixation. Either the solution was too weak, or the time was too short; or, what seems more probable from the appearance, the prints were allowed to stick together while they were in the fixing bath, so that the solution had not free action.

H. JOHNSTONE.—The studio arranged as shown in the sketch will do very well for part of the day; but we should advise you to arrange it so that the sitter can be placed at either end, then one end can be used in the morning and the other in the afternoon. You need never then be troubled with the sun.

T. RAYNER.—If the apparatus is patented you have no right to make it or to use it without a licence from the patentee. The fact that you make it yourself for use only in your own business and not for sale makes no difference whatever. You are appropriating another man's property—his patent—and that is illegal, and renders you liable to costly legal proceedings.

S. C. W.—Several different methods have been recommended for reducing over-printed albumenised paper prints; but the simplest way of dealing with over-printed impressions, and the one we always adopt when we have any such, is to put them into the waste basket and make fresh. It is a saving of trouble and time, and the result is far more satisfactory in the end.

L. Y. A. B.—No wonder the negatives are scratched and spoilt. Collodion negatives should always be varnished before they are printed from, or the result will be as you have discovered. A collodion film is not like a gelatine one, it must be handled with the greatest care until it is protected with a coat of varnish. Then the negative becomes even more durable than a gelatine one.

W. C. CUBBIN says: "I shall be glad if you will kindly inform me which you consider the best work or works treating on lighting, posing, and developing relative to high-class professional work."—There is no good work on posing and lighting extant. Bigelow's *Album* might be met with, second hand, and this would help you. As to development, a copy of the ALMANAC and our own pages supply all that you require to be told.

LENS.—A lens of the rapid rectilinear type, if a good one, of four inches focus, can be made to cover a quarter-plate sharp to the corners, but then it must be worked with a small stop, which would render it unsuitable for a hand camera for rapid exposures. If the negatives are, though taken on quarter-size plates, only required for printing lantern plates from, a lens of that focus will do very well, as it ought to cover three inches very well with a large aperture.

SEPTIMUS.—The whole of the prints sent show decided evidence of over-toning, hence the grey, mealy appearance. Although you desire a deep tone, you will not get it with that paper, because it will not yield it. If, however, the prints are taken on when they reach the red-brown stage, they will be good. This paper clearly, like some others, will not bear toning to the purple stage. Why not sensitise your own paper if you cannot get a ready-sensitised one that will give the tones required?

C. R. WILSON.—There is no mountant that can be used for mounting prints on thick rough paper on to the leaves—thin paper—of an album without causing cockling. The best, however, is a solution of gelatine in which alcohol is used to a large extent in the place of water. A thin solution of indiarubber in benzol as a mountant will avoid cockling altogether, but, unfortunately, after a time, sometimes a very short one, the rubber decomposes or "perishes," and then the prints come off the mounts.

W. W. W. asks: "1. What is the best collodion formula for making enlarged negatives from positives? 2. Is there anything that will prevent the wet plate from drying during a lengthened exposure?"—In reply: 1. Try the following iodiser:—Iodide of cadmium, 65 grains; iodide of ammonium, 25 grains; bromide of cadmium, 19 grains; bromide of ammonium, 11 grains; alcohol, 5 ounces. 2. By placing a sheet of wet bibulous paper behind the plate, it will have a tendency to prevent the plate from drying too rapidly.

C. A. complains that some cabinet mounts he has recently been supplied with are causing a great deal of trouble. He says that when the prints are rolled (hot rollers) the ink comes off the back of one mount on to the roller, and then sets off on to the back of the next one that is rolled and spoils the look of it. He wants a remedy. The ink is not really dry and hard. If the mounts are spread out in a warm room, exposed to the air for a few days, the trouble will, no doubt, be overcome. There is little question that the ink used by the printers in the first instance was an unsuitable one for the purpose.

BUCKINGHAM writes: "Is it correct that better dry plates are made on the Continent than those which are made in England, and is it for that reason that the plates one gets abroad are dearer than English plates? I am told by a foreign friend that French and German plates, though more costly than the best brands here, are well worth the difference. Is that so?"—No doubt, good plates are made abroad, but whether they are, as a rule, better or worse than those of home manufacture we cannot say. But this we can say, large numbers of dry plates are daily sent from England to all parts of the Continent, notwithstanding that they, in some places, have to pay a heavy import duty.

CONTENTS.

	Page
FOREGROUNDS WITH LENSES OF FLAT FIELD	241
COMMERCIAL COLLOTYPE	242
SOME PRACTICAL ASPECTS OF RESIDUE COLLECTING	242
ANOTHER PHASE OF REVERSAL OF THE IMAGE	243
PHOTO-MECHANICAL NOTES. By WILLIAM GAMBLE	244
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—V. By T. N. ARMSTRONG	245
"OUR ENLARGING APPARATUS AND WHAT TO DO WITH IT."—I. By J. PIKE	246
SOFTNESS OF DEFINITION. By EDWARD DUNMORE	47
A METHOD OF PREPARING PLATINOUS SALTS FOR PHOTOGRAPHIC USE. By J. VINCENT ELSDEN	248
ON REACTIONS ACCOMPANYING THE DECOMPOSITION OF SODIUM THIOSULPHATE IN FIXING PHOTOGRAPHIC PLATES. By MM. SEYEWETZ AND G. CHICANDARD	249
OUR EDITORIAL TABLE	251
NEWS AND NOTES	251
RECENT PATENTS	252
MEETINGS OF SOCIETIES	253
FORTHCOMING EXHIBITIONS	254
CORRESPONDENCE	254
ANSWERS TO CORRESPONDENTS	256

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1825. Vol. XLII.—APRIL 26, 1895.

EXPERIMENTS WITH FORMALIN: WASHING NEGATIVES WITH BOILING WATER.

It will be remembered that, when we last wrote about the properties claimed for formalin in relation to its action upon gelatine, we had not made any trial of it, owing to difficulties in the way of obtaining this substance. Having lately devoted a little time to becoming practically acquainted with this as yet comparatively little-known body, we propose giving here the results already obtained, hoping soon to be in a position to resume it, and give more details than we are able to do at present.

We may reiterate that the special value claimed for formalin or formic aldehyde in relation to photography lies in the fact that by applying it to a wet gelatine negative, whether such gelatine be made upon a glass, celluloid, or paper support, it is immediately rendered insoluble, even in boiling water and other menstrua in which it was formerly soluble.

It is from a conviction that formalin is destined to become of considerable usefulness in photographic practice that we recommend those readers of an experimental turn of mind to subject it to trial, and note its action upon gelatine, at varying lengths of time and under differing conditions of strength.

We premise that formalin or formaldehyde, although we have not yet seen it quoted in the price-lists of photographic dealers, can now readily be obtained from such chemical firms as Hopkins & Williams, where we procured it at 3*s.* 6*d.* per pound. Formalin is a clear liquid, and is a forty per cent. solution of formic aldehyde, which, at ordinary temperature, is a gas. Its action upon gelatine is a very powerful one. When we commenced experimenting with it, we had formed the intention of noting its actions under varying degrees of dilution, so as to be enabled to deduce reliable formulæ from a number of trials. Our first attempts were made with a solution somewhat stronger than two drachms of formalin to the ounce. In reality, the proportion was two drachms of the formalin placed in a graduate, and water added to bring it up to one ounce. A negative was then taken out of the fixing bath, and, having received twenty minutes' washing, was transferred to the diluted formalin bath, in which it was allowed to remain with frequent agitation—such agitation as a negative receives when undergoing development—for two and a half minutes. It was then removed, and subjected, for about one minute, to a spray of water to assimilate its surface to the water, for at first, when taken from the formalin solution, the surface had a kind of repellent appearance over which the water ran as if it were greasy. The sympathy between the surface and the water was fully established in less than a minute under the spray. Having a kettleful of boiling water standing on a Bunsen stove conveniently at hand, we then deluged the plate with the boiling water, in which we allowed it to remain for a few seconds, finishing up with another boiling douche. The heat of the plate was now such that the gelatine coating was rendered quite dry in much less than half a minute, and the surface, when dry, was very hard and strong.

Some changes were now rung upon the method of proceeding. First of all, the dilution of the formalin was carried to a much greater extent. Having found that insolubility was produced by two drachms of the formalin to six of water, we now reduced its strength in the proportion of one drachm to seven of water. After fixing a negative, we did not give it a complete washing as before, but merely subjected it to a very slight rinsing, just so much as would have prevented the hyposulphite from crystallising out on the surface had the plate then been dried. The negative was then immersed in the diluted formalin, as in the previously mentioned experiment, after which it was treated with hot water, followed with a copious douche of boiling water. We had purposely left the negative unwashed after fixing, except by the slight rinsing spoken of, our intention being to ascertain whether the hyposulphite would not be as quickly eliminated from the film by the copious application of the boiling water for a brief period as by the prolonged application of cold water, as done in every-day practice.

We have long been familiar with the fact that, when washing either a negative or a positive in a collodion or albumen pellicle with hot water, the fixing salt can be removed in a very brief period indeed; and, notwithstanding that a gelatine film, from its greater thickness and sponginess when wet, lends itself more easily than either collodion or albumen to the retention of saline matter, we also trusted to the powers of hot water, applied with some degree of force to the gelatine surface, to penetrate its porous body, and eject everything that was soluble in an aqueous menstruum. The test we applied for the efficiency of this simple and quick means of removing the hyposulphite may not be the very best in strict chemical qualitative analyses, but long experience has proved it to be quite good in photography. We refer to the starch and iodine test.

Experienced photographic chemists need not be told either how to make or to use iodide of starch as a test for hyposulphite; but, as some may read this article who are not aware

of it, we will tell them how we made and applied it in the experiment just described. Having boiled a little starch in distilled water, add to it two or more drops of tincture of iodine, which will turn the starch solution into an intensely blue colour. Now catch some drops of the water by which the plates were last washed, and add to it one or more drops of the blue starch solution; and, if the blue colour is discharged, it indicates the presence of hyposulphite in the water. If, on the contrary, the blue colour remains, it proves the absence of the fixing salt.

Several experiments with formalin are pending which, when completed, will, we hope, enable us to give formulæ for the more useful applications of this substance. Among these are the conditions under which plates may be treated previous to exposure in the camera, so as to render possible the application of warm developers, or even of developers warmed up to the normal temperature of tropical countries.

Having had some experience in developing plates in a country in which the atmospheric temperature very far exceeds what has ever been known in England, we, and every one who has had similar experience, will welcome every expedient which will prevent the gelatine film from liquefying and running over the surface of the glass plate, during either development or drying. Some American makers of plates have, it is stated, already made important advances in this direction, but their methods are kept *sub silentio*. We shall be glad to hear of the results obtained by the use of formalin.

THE DECOMPOSITION OF SODIUM THIOSULPHATE.

The extremely interesting paper by MM. Seyewetz and Chicandard, of which we published a translation last week, throws a good deal of light on some hitherto obscure points in connexion with the practical use of the "combined" toning bath, the acid fixing baths, and combinations of "alum and hypo" generally; and, if it suggests any thoughts to the mind of the intelligent worker, it must emphasise what we have for many years past tried to impress upon our readers, namely, the extreme danger that surrounds the use of "hypo eliminators" or of any mixtures in which hypo is accompanied by alum or an acid. Further than this, it indicates in what manner the use of what have hitherto been considered perfectly harmless agents, such as sulphurous acid or the sulphites, may really prove a source of danger.

It is now some fifteen or sixteen years since we first raised a protest in these columns against the use of alum and hypo as a fixing bath, serving also the purpose of hardening the film, and not long afterwards we had to warn our readers against the practice then beginning to creep into use of employing so-called "eliminators," or agents intended to decompose any traces of sodium hyposulphite that might remain in the gelatine film after a too hasty or imperfect washing. As we have always pointed out, it is not so much the sodium hyposulphite or thiosulphate that acts injuriously upon prints or negative films, as the hyposulphites of silver, which necessarily accompany it; and the decomposition of the one, whatever may be the means employed, must obviously be followed by, or rather take place simultaneously with, that of the other.

The presence of silver salts in any appreciable quantity when an eliminator is employed would naturally produce a more or less noticeable immediate effect, but not so plain sodium thiosulphate, and it has been customary to assert, and under favourable conditions it has been proved to be the case, that prints or films may remain uninjured for considerable periods, extending even to years, although they may contain hypo—plain hypo without any silver compound—in considerable quantity. The researches of the two gentlemen named show, however, that, although such films may last for a time, they contain within them the seeds of eventual decay, only awaiting a favourable opportunity to start into activity.

But, further than this, it is also demonstrated in MM. Seyewetz & Chicandard's article how extremely dangerous any of the combinations of hypo with alum or acids of any sort may prove, even when employed in accordance with the most carefully worded instructions as usually given, and it may be said that a good deal of light has been thrown upon the cause of many of the discrepancies we hear of in the employment, more especially of the combined toning bath, but in a less degree, of the acid fixing solution. Probably also numerous mysterious cases of fading, especially of negative films, could be traced, if the actual facts were available, to the tardy or deferred nature of some of the reactions of the sulphur that, liberated by the decomposition of the hypo, combine with the sodium sulphite produced by that decomposition to form sodium bisulphite, which in turn converts the sulphur thrown out of the original combination into trithionic acid; and, when the hypo is in excess, by a series of complex reactions the same result is arrived at as with any of the stronger acids, and sodium sulphate, sulphuretted hydrogen, sulphurous acid, and water are formed, but apparently without the precipitation of sulphur.

This is somewhat contrary to the accepted belief that sulphurous acid, or an acid sulphite, is a harmless addition to hypo in the formation of the acid fixing bath, for, as will be seen, the dangerous sulphuretted hydrogen is formed, as well as a fresh portion of sulphurous acid, which is, of course, capable of starting *de novo* to set up a fresh series of reactions of a precisely similar character; or, rather, the action is a continuous one, going on with gradually decreasing energy until the hypo present is exhausted.

In the same manner it is shown that sulphuretted hydrogen, another of the products of the decomposition, has itself a further action upon the hypo in excess, causing it to split up into bisulphite and bisulphide of soda and sulphur, the first of which, as already shown, starts fresh to set up another series of decompositions. Further, sulphurous acid and sulphuretted hydrogen themselves react slowly upon one another, so that the whole process is one of the greatest complexity and is practically interminable, the products formed including, amongst less harmful substances, sulphur, bisulphide of sodium, and sulphuretted hydrogen.

In the same manner it is shown that the behaviour of alum or of aluminic sulphate with hypo is of an almost identical character. The aluminic salt is first converted to the state of thiosulphate, and then by further decompositions reverts to its original conditions to start afresh, and so the process goes on continuously, as in the case of an acid, until the hypo is exhausted, the final products being practically the same as those already enumerated.

But, in addition to the continuous and apparently never-ending characters of the decomposition, the authors also point out that the effect of bisulphite or sulphite of soda in the solution is to very greatly retard the mutual reactions of alum and hypo, although, in the case of acids, it is comparatively slight.

Now, although these investigations perhaps have very little direct bearing upon the comparative permanency of prints or films after completion, they speak very strongly indeed against the employment of any combinations of hypo with alum or with acids; indeed, it seems impossible, except under circumstances where every possible precaution is observed at each stage, both in the preparation and in the use of such solutions, to ensure that the elements of danger have been completely eliminated.

In the course of experiments made some years ago with alum and hypo, we were struck by what almost appeared to be anomalies between the reaction in hot and cold solutions respectively when these two agents were mixed, and, further, by a certain disagreement with the text-books in some of the results of these reactions; but, as pointed out by the authors of the paper referred to, the conditions under which we work photographically differ very materially from those under which the investigation of the reactions would be made by a chemist. The latter, for instance, would study the reactions of alum and hypo upon one another, if not in absolutely equivalent, at least in some definite, proportions, whereas, in the case of the photographer, the changes that go on occur in the presence of a very large excess of hypo generally, a circumstance that, as is shown, makes all the difference in the world.

Take, for instance, the action of acids upon sodium thiosulphate. We are accustomed to believe, and the text-books tell us, that, if we add hydrochloric acid to a solution of hyposulphite of soda, sulphurous acid and sulphur are liberated and chloride of sodium left in solution. Such may indeed be the case when the two substances are mixed in equivalent proportions or with the acid in excess, and there the reaction practically ends; but, as is now shown, when the hypo is in excess, an entirely different reaction, or series of reactions, occurs. The liberated sulphurous anhydride combines with a portion of undecomposed hypo to form acid sodium thiosulphate, a very unstable substance, which spontaneously decomposes, splitting up into sulphuretted hydrogen, sulphurous anhydride, and sulphur, sulphate of sodium being left in solution. This explains why, on adding an acid to a solution of hypo, the presence of sulphuretted hydrogen is always to be detected by the smell. In point of fact, the products of the first reaction again react upon further portions of the excess of hypo, and the decomposition proceeds slowly but continuously, until it ceases only from the proportion of hypo left being too small to act further.

But a new point brought forward by MM. Seyewetz & Chicandard is in connexion with the action of sulphurous acid and the acid sulphites upon sodium thiosulphate. As already mentioned, when a strong mineral acid such as hydrochloric or sulphuric is added to a solution of hypo, the acid combines with the sodium, precipitating sulphur and liberating sulphurous anhydride; but, in the case of sulphurous acid, it appears the case is somewhat different. In mixing up solutions either for the combined toning bath or for acid fixing, as all know, a copious deposit together with a plentiful evolution of unpleasant gases takes place; but in ordinary practice, after a few hours' rest, it has been the custom to consider the reaction complete, and after filtration or decantation the solutions are taken into use and are considered as stable and trustworthy. Now, it is shown that such is far from being the case, for, though the more energetic portion of the reaction may be completed, it is still proceeding, though at a slower pace.

In a smaller degree, the same changes will proceed in the case of prints or films from which the hyposulphites have not been removed if the conditions are sufficiently favourable, as, for instance, if they be exposed to a moist atmosphere; but naturally, from the more minute qualities of the materials present under these circumstances, the change will be still slower, although none the less sure.

In conclusion, we would recommend those of our readers who have not already done so to give the article in question a very careful perusal, as it cannot fail, as we have before suggested, to throw light upon many hitherto obscure points and anomalies in connexion with "combined" hypo baths.

Silver.—It is but a few weeks since we called attention to the then abnormally low price at which metallic silver had for some time been quoted—a fraction over two shillings and threepence per ounce. Since then, however, notwithstanding that America sent us over forty tons of the metal in a single week, the silver market has improved surprisingly. Last week the metal was quoted within a fraction of two shillings and sevenpence an ounce. This means, taking into consideration the greater purity of the silver recovered from *carefully* collected photographic wastes over the standard bars, a rise of a full fourpence per ounce. We wonder how many photographers give a thought to the state of the silver market when they have the metal to dispose of. A difference of fourpence per ounce on the yearly collection of some establishments is a considerable item.

Art Exhibition in the City.—The City was, till recently, considered purely commercial, and money-making, and sometimes losing, was its special *forte*, and so it is still, yet art is becoming recognised, as witness the artistic new buildings erected during the past few years, and the sums given by the Corporation, and the various City companies, for the furtherance of art and science education. On Saturday last, the Lord Mayor opened the fourth annual Exhibition of pictures, loaned to the Corporation, at the Guildhall; the private view was the day before. In the collection are very many examples by the first masters. The Queen, from her private collection, has lent a couple of fine works, a Metsu, *The 'Cello Player;* and a Van-der-Meer, *The Music Master and Pupil.* The Corporation of Liverpool contribute their famous picture of *Samson*, by Solomon. The Corporations of Manchester, Leicester, and Glasgow have also contributed from their collections, as have also the Marquis of Dufferin, Lords Burton, Brassey, Wantage, the Earl of Northbrook, Sir Julian Goldsmid, and many other owners of fine pictures. A very interesting collection of examples of the goldsmiths, gem engravers, and sculptors' art of the fifteenth and sixteenth century are also lent by Mr. J. C. Robinson, most of which were recently exhibited at Burlington House. To show how art is appreciated in the City, it may be mentioned that, while the show was opened last year, it was visited by upwards of 300,000 people. The present Exhibition will be open *free, Sundays included,* till July 21.

Shutters.—The season for hand-camera work is now commencing, and those who have had their cameras stowed away during the winter months will do well to overhaul the shutters before again taking them into use, that is, if they desire to know the approximate time of the exposure they give. It is not the first time we have called attention to the fact that, although shutters may work at the rates marked upon them by the makers when they are first issued, those rates are often materially altered by very trivial causes—a particle or two of grit acquired on a dusty road, for example. Two circumstances, again, call this matter to our mind. One was this: Driving for some miles along a dusty country road not long ago, much

frequented by cyclists, some of whom were provided with hand cameras, most of them, like the owners and the cycles, were white with a fine penetrating dust, which must have much retarded the speed of the shutters when used. The other circumstance was this: A friend unearthing a hand camera a few days ago, which is fitted with a shutter said to work from the one-hundredth to the tenth of a second—and doubtless it did approximately so when first sold, and it apparently did so still when set at quick rates—found when set at its slowest, although the tension was taken off the spring when it was stowed away—it would not work at all, that is, it left the lens partially uncovered. The apparatus was taken to pieces, cleaned, and put together again; but there was no difference in the working. It was then discovered that there was slight oxidation on the break, and, when that was removed, the shutter worked all right again. A very slight disturbing cause will materially influence the rate of a delicately constructed shutter, therefore the speeds marked on them cannot be relied upon unless the condition they left the maker's hands in can be relied upon. Some workers often say that such-or-such a picture was taken in, say, the fiftieth of a second, when the speed of the shutter was but the twentieth—frequently to the advantage of the picture, though. By the way, the latter speed is quite fast enough, so far as "instantaneity" is concerned, for many subjects, while a better-exposed and more harmonious negative is secured than is possible with a a briefer time.

Photo-mechanical Work.—The leading article, *Commercial Collotype*, and a letter from a correspondent in our last issue, are certainly not in unison, except perhaps on one important point. We strongly regretted that photographers had hitherto allowed the photo-mechanical processes to drift into other businesses, instead of retaining them in their legitimate sphere—photography. Our correspondent warns photographers that the photo-mechanical businesses are already overstocked and says "the supply is more than equal to the demand, and that competition is extraordinarily keen." But is that not the case with every other business, photographic and otherwise? The writer further says, "the photographic papers have urged process with all the enthusiasm of fanatics," &c., and goes on to allege that large capital and expensive plant are necessary, as well as great business energy. The latter is essential nowadays in every industry, and the former in some, but not in all. Where, for example, is the costly plant, beyond what every photographer is already possessed of, required for the production of half-tone process blocks, for photogravure, "zinco blocks," or for photo-lithography? A few pounds only will cover the outlay for any of the processes, and they are the ones in most general use. It is true that collotype machines are as costly as litho machines; but hand presses are not. We are afraid that many photographers have been deterred from entering the field of mechanical photography by the "bogey"—costly appliances. On several occasions during the past year we have protested against the suicidal policy of "cutting prices." German houses are credited by our correspondent with bringing them about. That is not the case. English blocks were produced long ago for less than the German ones, and are still. It is not in the lowness of price that the German competes so much as in the quality of the work itself. The cost of carriage, time of transit, and the like, one would think should place the foreigner out of competition with the English block-maker with work of equal merit. The one point we are in unison with our correspondent is inferiority of work. We refer to the number of collotype prints that were sometimes rejected as not being equal to the proofs submitted, and that that was bringing a good process into ill repute. He says he was told last week by the manager of a photo-mechanical establishment that, "as to their collotype department, owing to the erratic nature and uncertainty of the process, and the loss occasioned by the many returned views, and the consequent replacing the same, the firm were seriously thinking of abandoning collotype." Now, the synonym of "erratic nature" and the "uncertainty" of any process is want of skill and knowledge on the part of its workers, and collotype is no exception. If the work were good, there would be no rejections, and in any well-regulated collotype establishment bad work would not be issued. That it is done supplies the proof that the field is open, and likely to proof remunerative, to skilful workers, and we commend it to photographers as being more particularly in their province than that of any other trade.

JOTTINGS.

JABEZ—the one and only Jabez—is coming home. It is said that he was originally marked down in his far-off Argentine retreat by the aid of a photograph reproduced in an English illustrated paper. Surely Sir Frank Lockwood, of whom I have something to say a little later on, will, as an officer and upholder of the English law, now modify his rancour against photography, and allow that a single virtue or achievement such as this outweighs all its inimical or dampening (?) effects on the fortunes of the young artists who vainly stump Fleet-street and the Strand with portfolios of sketches under their arms? There are vastly more photographers than artists in the community, I'll warrant, so that it may be worth the while of Sir Frank Lockwood, as a member of a somewhat shaky Government, to amend his estimate of the artistic powers of photography. Unless he does, the Camera Club and the Linked Ring will vote Tory to a man at the next General Election, and the Liberal party will consequently be placed in a pitiable minority. Look to it, Sir Frank!

The answer given last week as to the relative developing proportionality of sodium carbonate and ammonia ·880 (or, having regard to Messrs. Haddon & Grundy's dicta on this point, what passes for ·880) suggests to me that possibly a table of the equivalence of the alkalies in common use might be of service. I append one given by M. Albert Londe:—

EQUIVALENCE OF THE ALKALIES.

Caustic soda.	Caustic potash.	Carbonate of soda.	Carbonate of potash.	Ammonia.
1	1·400	2·650	2·650	0·425
0·714	1	1·927	1·927	0 301
0·377	0·528	1	1·301	0·160
0·289	0·405	0·768	1	0·123
0·352	3·298	6·235	8·117	1
1·666	2·333	4·416	5·570	0·708

Dust is the photographer's greatest enemy. It is omnipresent. I am not going to dilate upon its wonderful property of defying the most studious care of the photographer to avoid it, or dwell upon the havoc it works on his negatives and prints; for is not all this written in former volumes of the JOURNAL (q.v.)? I will, however, give my readers a hint which may be worth noting as regards dusting their plates preparatory to placing them in the slides: It is, not to use a brush or any similar implement, for dusting the surface of the sensitive film; but simply to knock the plate at one corner rather smartly on the table or bench. This will disengage any temporarily adhering particles. A practical friend of mine, and a clever photographer, with whom I was changing plates a few weeks back, told me that by the adoption of this trifling and untroublesome precaution his negatives were always freed of dust spots.

Mr. Harry Furniss, in the *New Budget*, has been quick to profit by Sir Frank Lockwood's plea for the publication of more original drawings and fewer photographic reproductions. "Lika Joko" points with pardonable pride to his first number, which contains thirty reproductions of original drawings by artists, and only nine photographs. Photography of any kind has no greater lover or well-wisher than myself, but I am bound to say that I have a considerable degree of sympathy with Sir F. Lockwood, Mr. Pennell, and many others in their onslaught on the great prevalence of reproduced photographs and drawings. To paraphrase a line of Mr. W. S. Gilbert's, "the fixed mechanical style" of the etched block has an irritating and dulling effect on me, which a wood-engraving, however poor and spiritless, never has, and I fancy this feeling is largely shared by others. By the way, Mr. Furniss publishes a capital portrait of Sir F. Lockwood, and slyly calls it, *From life—warranted not a photograph.*

The discussion on ideal half-tone printing, which took place the other night at the Royal Photographic Society, elicited many points of great interest to block-printers, I am sure, but I take leave to hope that one aspiration uttered in the course of the discussion will not be realised. I allude to Mr. W. Gamble's reference to a possible future in the direction of intaglio work for half-tone printing. He is reported to be of opinion that, if a mechanical grain could be given to a photogravure plate, it could be printed in a machine, and would be the ideal of half-tone work. Now, to my mind, the great charm about a good impression from a carefully etched intaglio plate is its approximate resemblance to a hand etching—a resemblance which a uniformly regular grain would assuredly do much to destroy, while at the same time it would possibly sound the doom of photogravure as a medium for the highest class of reproductions. As I write, some exquisite Continental photogravures are before me, and I am trying to imagine how they would look plus the hateful mechanical grain Mr. Gamble advocates. I do not think I should like them nearly so well, and I believe my antipathy would be generally shared.

"Practical," who last week uttered a word of caution to photographers contemplating embarking in process work, has much wisdom and common sense on his side. His letter, which I commend for general and careful perusal, looks as if it were written after what I have said on the same subject during the last few months had been thoroughly digested. I do not go so far as he does in condemning, right away, half-tone engraving for photographers — indeed, except in so far as his remarks concern the larger centres of industry, I think he somewhat exaggerates the extent to which competition has been carried. I reiterate my advice to photographers in the smaller towns to include photo-engraving among their branches of work. There may not be a fortune in it, but in these times no order, however small, should be despised, and half-tone work, like portraiture, is split up into innumerable small orders, especially in the country.

My advice to photographers to take up note-paper portraiture is, I am glad to be informed, being weighed and availed of by many of my readers. Messrs. Beeching, whose advertisement I quoted a fortnight ago, say they have had many communications from photographers asking for terms, &c. But come, you silly people, I advised you to do the work yourselves, not to get somebody else to do it for you. It is sound and good advice, and "there's money in it;" so why not take it? Which of you who has profited by the hint will gratefully present "Cosmos" with a ream of letter paper with his portrait printed upon it?

Mr. Patterson, who (on p. 254) suggests that the method of making reversed negatives from negatives by over-exposure and development might be employed for certain photo-mechanical printing processes, is obviously unaware that the plan has been practically availed of for several years. A cheaper illuminant than magnesium ribbon, namely, daylight, is generally used, as well as a slower plate than that named by Mr. Patterson. Mr. W. Bishop, Mr. Frewing, and others called attention to the "process" a little while back; the last-mentioned gentleman works it commercially, I believe.

I was very much surprised to read Mr. Martin J. Harding's charge of "plagiarism" against Mr. John A. Hodges. An opportunity of comparing the *Scraps* article with Mr. Harding's little book has been given me, and I do not hesitate to say that it appears to me the latter gentleman was not justified in the action he took. I hope to find that he has entirely withdrawn from the position he so hastily assumed. Mr. Hodges is one of our most experienced and practical workers, and a man of honour who, from personal knowledge of him, I regard as being the last person likely to stoop to the course imputed to him by Mr. Harding. There is, as we all know, no novelty of principle or idea contained in the advice to adopt small work with a view to subsequent enlargement; but, apart from that matter, if the chance use of an identical phrase or sentence in photographic literature is to lay one open to imputations of plagiarism, pray which of us would escape?

There is, however, a form of plagiarism that is rife among certain photographers to which I have for some time past intended to refer; I allude to slavish imitations of the style and subjects of successful exhibitors, which I consider an even meaner sin than literary piracy. I know of many cases where exhibiting photographers have selected certain districts, well studied the subjects to be found there, and having photographed them have, after great care and labour, earned name and fame for their works, only to provoke other photographers of less creative skill to set about imitating and copying the subjects so successfully depicted. Of course there is the theory that an ambition to do better than those that have been before them has instigated the newer men to adopt precisely the same subjects and style of treatment, and I am compelled by motives of justice to mention it; but I decline myself to give it any support, for, as it is in photography, so is it in other branches of creative work. It says much for the good sense of the Judges at photographic exhibitions that they rarely fail to pass over these obviously imitative efforts, no matter how good they may otherwise be.

I am sorry that circumstances prevent me accepting Mr. Snowden Ward's invitation to act on the Committee of the Benevolent Association. I think I can better take a real and practical interest in the affairs of the Association by remaining outside, and helping it to the best of my ability with my pen or otherwise. There is not a line in Mr. Ward's admirable and sympathetic letter which is not instructive, thoughtful, and interesting. Briefly, it all comes to this, that the Benevolent has failed on the subscription plan adopted by some hospitals; that it cannot be conducted on the lines of a benefit society; that it must be administered solely as and for a benevolent institution—that is, the one and only qualification for assistance is poverty. Does not this read very much like putting a premium on unthriftiness and contempt for the rainy day? My mite and my support shall be placed at the disposal of the Association, but I would yield up both more readily, and I believe this to be the feeling of many hundreds of others, if more support were forthcoming from the class which furnishes most, if not all, the recipients of the Benevolent funds.

Mr. J. A. Randall (p. 256) is a sensible man. He sees little hope of success in the resuggested Photographers' Assistants' Union, no common ground at present existing among assistants, and he therefore, wisely, I think, discourages any action being taken in the matter. The conditions of employment among operators and photographic assistants generally vary with the individual, so that a uniform basis of working is out of the question; but Mr. Randall proposes taking the just and practical course of warning his fellow-assistants against the sweating firm of whom complaint has been made in these pages, and in that intention I am sure he will have the sympathy of every fair-minded man. I am sorry to have to admit that professional photography peculiarly lends itself to the infliction of hardship and injustice upon *employés*, and I wish Mr. Randall and others similarly impelled every success in their endeavours to defend themselves against unscrupulous masters.

Mr. G. E. Brown, on p. 220, says that a very useful way to make use of spoilt celluloid films is to convert them into funnels; and he goes on to describe the simple *modus operandi* necessitated. Here is another use to which a celluloid film or negative may be put. At the termination of the awful frost we all suffered from a month or two back, I discovered a fracture in a water pipe situated in my domestic cellar. It was about an inch long, and just broad enough to admit of the egress of a trickling stream of water. The services of a professor of the noble art of plumbing being then at a premium, it became necessary that the facture should be temporarily repaired,

and I found a couple of celluloid negatives tightly bound round the pipe most effectual for the purpose. This repair was executed nearly two months ago, and, pending completion of certain negotiations with the water company, the films still remain on the pipe, and entirely prevent leakage.

I observe that a peculiarity of Messrs. Thomas's new anti-halation plate is that, after development with pyro, a slight brown stain is left, which is removable by a clearing bath. It is obvious that, under some circumstances, the "stain" would be advantageous rather than otherwise, and I have no doubt therefore that at times its presence will be welcomed. Which reminds me that a few months back my attention was drawn to a new ready-made developer in two solutions, one feature of which was that it imparted a pyrolike stain to the negative at will. One of the cleverest portrait photographers we have told me the other day that he preferred his negatives with a slight veil or fog on them. I presume the yellowish stain I am alluding to would serve just as well as "fog" for securing softness of image, which is the great end my interlocutor always keeps in view.

A contemporary says that "arrangements are being made for testing the bearing power of bridges by means of photography. A negative is to be taken when the bridge is unoccupied, then heavy trains are to be run on, and another negative taken from precisely the same point. Prints from both plates are to be made, or one negative can be placed over the other and the straight lines compared. Any undue weight will show by the sagging of the bridge or the bending of the supports. Photographs of various parts of the bridge, both under strain and unladen, will, it is stated, show clearly when enlarged any weak points, and will furnish excellent directions where there is uneven bearing for supplying additional strength and changing the points." I am under the impression that the novelty of this application of photography is far less than is here suggested; at any rate, I am positive of having read of this method of testing bridges some years ago, but I make the reference to illustrate, for the benefit of newer readers, the marvellous scope which photography embraces in modern science and industry. COSMOS.

THE SIZES OF PLATES AND PAPER.

MAY I add a word or two to what I have already said in regard to the sizes of cut paper in reply to Messrs. Wellington & Ward's letter in last issue? They apparently recognise the reasonableness of my suggestion as to reduced sizes, and go so far as to offer a concession in the shape of a new size, 4×3, because there are so many hand-camera workers of quarter-plates. If 4×3, why not other sizes as well, for surely the necessity exists equally of trimming a half-plate or a 12×10 picture as a smaller one?

In all respect to Messrs. Wellington & Ward, as well as the dealers, I do not quite follow the logic of their argument that they must "study the dealers" in the matter of sizes, &c. Do "the dealers" exist for the purpose of supplying the consumers, or do the latter exist merely for the sake of helping dealers and manufacturers to make a living? It seems to me the first is the most natural supposition, and, that being the case, both makers and dealers ought to study what best meets their customers' requirements without any reference to locked-up capital. Dealers are not compelled to stock odd or unasked-for sizes any more than Messrs. Wellington & Ward are to cut or advertise them; and if the former would cease to stock such sizes—the demand for which only comes from themselves—the manufacturers would not have to make them.

Whether the present full-size sheets remained in demand or not, I am perfectly certain, not only from my own feelings, but also from those of every single individual to whom I have spoken or from whom I have heard on the subject, that there would be a good market for the trimmed sizes I suggested, and, if any one would place them before the public, I feel pretty certain that dealers would very soon find it did not pay to keep the old sizes in stock.

As it is, I do a good deal of my own printing upon albumen paper, because, when I have to go to the trouble of cutting up paper and trimming prints, I prefer to use paper that will give me a fair return in silver residue, and not a heap of sulphate of barium.

With regard to Messrs. Wellington & Ward's suggestion as to reducing the number of different sizes of plates, it is a very good one if it could be only carried out; but, when in spite of the almost innumerable sizes and shapes that already exist we find individuals who for their own use will have a special size half an inch longer or half an inch narrower than some existing size, it seems rather improbable that we shall ever arrive at unanimity in this direction. I was told by an old friend the other day, a man of forty years' experience as an amateur, that he is going back to 15×12 *cut down to* 15×8 and *wax paper*. Good old Conservative!

But, seriously, it would be a good thing if camera-makers, plate and paper-makers would combine to do their best to reduce the number of sizes by charging proportionately more for odd shapes and dimensions. But then comes the difficulty, Which are to be the favoured or selected sizes? W. B. BOLTON.

THE AMOUNT OF SILVER IN ALBUMEN PAPER PRINTS.

I NEED hardly say that I was very pleased to see the article on this subject by Messrs. Haddon & Grundy in the issue of February 1, also that by Mr. Edward Dunmore in that of February 15, because it showed the interest that scientific men like the former, and thinking practical workers like the latter, take in the questions that I raised in the issues of September 21 and October 5 last, and the importance that they attach to them in regard to photographic investigation.

It seems very absurd, when one comes to think of it, that in these days, when the world is ringing with the wonders of the results of photographic work, a discussion can be going on as to what constitutes the image in an albumen print, and how it is produced. We know little more about it now than they did fifty years ago. At that time some one decided that the density of the image was, practically speaking, reduced silver, and that the organic matter in the albumen and the paper acted as a sort of developer to bring about the reduction of the silver salts under the action of light. And there the matter seems to have been left.

Now, what facts have we in support of this theory, when we come to apply it to practical photographic printing? As about $\frac{97}{100}$ of the silver is taken out of the film, I think, we can answer, Few, if any. True, when we expose a sheet of sensitised albumen paper to light until it is bronzed, we find that there is a visible deposit of reduced metallic silver on the surface; but, as an exposure of the paper to that stage is entirely out of the range of practical photography, it does not help us in this inquiry, even then there is only found about $\frac{1}{7}$ of the silver used in preparing the sensitive surfaces.

When we only expose the paper so as to obtain the same density that we print the shadows from an ordinary negative, we find such a small amount of silver left in the film after it has been fixed and washed, that really I cannot see how we can call it a silver image at all, because the reduction to metallic silver does not appear to commence to any extent until the paper begins to bronze, and even then $\frac{6}{7}$ of the silver is not reduced at all.

It is evident to my mind that we have been on the wrong track as to the action of the silver in ordinary photographic printing, and I contend that its action must be, to *produce organic coloured matter* on exposure to light, from its previous combination with the albumen and fibre of the paper, and after that its work is done. In other words, it is the means to an end, but not the end itself. We may make experiment after experiment to prove this.

First, with regard to the chloride of silver present, we must remember that practically speaking, this does not add to the density of the image. The part it plays is simply to act as an accelerator to hasten the action of the light on the organic silver salts. If we expose silver chloride to light by Sir John Herschell's well-known method, we find that it is reduced to a subchloride which is dissolved by the hyposulphite of soda in the fixing bath, only a very small trace of metallic silver being left behind.

This is why we have to over-print. It is the subchloride which gives us the false density which is removed in the hypo bath. It is the organic silver salts which give us the real density. The organic coloured matter thrown down by the silver is not dissolved by the hyposulphite of soda, it is altered in colour when put in the fixing

bath, through the silver in combination with it being dissolved out, but there is little loss of density when it is dry.

It is true that there is a small trace of metallic silver bound up with the coloured organic matter, but the quantity is so small that, although it may act as a mordant, it can have little power in producing density, seeing that it only consists, when added to the metallic silver left behind from the dissolved chloride, of $\frac{1}{36}$ of the silver used in the preparation of the paper. The *real problem is*, What is the action of the $\frac{35}{36}$ of the silver (combined with the chlorine and organic matter) used in producing the photographic images, which are removed in the fixing bath and washing waters, and why are they necessary? That they have some definite work to do is proved by the fact, that if they are not present density cannot be obtained. The action of sulphuretted hydrogen on these deposits is another proof that the density of the image is given by other matter than silver. If we expose reduced metallic silver to sulphuretted hydrogen, it is darkened in colour; but, if we put in fixed but untoned albumen print to the same test, the image is soon bleached out, leaving only a faint trace of yellow sulphide of silver behind.

Again, the action of the toning bath seems to be more a combination of the gold with the organic matter than a gilding of the atoms of silver. If we fixed and washed before toning, we might think that possibly the gold acted upon the trace of silver left in the film; but as we tone before fixing, with the subchloride and insoluble silver salts still in the albumen, and, as the gold does not seem to prevent them being removed in the hypo bath, it looks as if the gold acted as a preservative to the organic matter rather than the silver; in other words, it seems to prevent the bleaching of the coloured matter rather than prevent the formation of the metallic silver into a sulphide, that is, if one can judge from the appearance of a print tested with sulphuretted hydrogen.

To return to the original subject. In my experiments during the last dozen years with various organic silver salts, there has been continually cropping up this most mysterious problem as to the action of the excess of silver that practice teaches us is absolutely necessary to be used above that actually found in the image after it had been through the hyposulphite of soda bath and necessary washing waters. This excess need not of necessity be *nitrate* of silver, as some suppose; indeed, beyond a certain excess of silver—say, about thirty-three per cent.—above that supposed to be taken up by the chlorine, other nitrates, such as that of ammonium (as mentioned by Mr. Dunmore), can be used, and will do the same work in the production of density of image as if the full quantity of silver nitrate had been used.

This proves that, beyond a certain point, density of image is not being produced by a reduction of silver on exposure to light, because, if it were, free nitrate of silver would surely build up a stronger image than nitrate of ammonium.

Again, one may bronze a sheet of albumenised paper as much as possible by exposure to light, and yet only about one-fifth of the silver supposed to be taken up by the chlorine even is found in the image, to say nothing of the silver used in the form of albumenate, &c., from which not an atom of metallic silver remains to be accounted for.

These facts all go to prove that there must be some other action going on in the film during its exposure to light which has been entirely overlooked.

Even with developed films we find that there must be some secondary action going on during development, the colour of the deposit depending upon organic or other matter from the developer (or the vehicle holding the silver haloids in suspension) being thrown down with the reduced metallic silver to form the image.

Take the case of two similar plates which had received the same exposure, and developed to the same point, one with ferrous-oxalate developer, the other with pyrogallic acid (without sulphite). Can we think for one moment that the two deposits are identical? which, had they consisted simply of the reduced metallic silver, they would have been.

With chloride plates this question of colour of deposit is especially noticeable, and we begin to find characteristics more nearly approaching a printed-out image. The red deposit, which contains the least amount of silver, is found when the exposure to light has been the most prolonged. And we have here another example of the strange fact that, beyond a certain stage of light action, the silver, instead of being deposited during development in a metallic state, acts as an active agent in producing a deposit of coloured matter from the organic substances with which it is in contact.

The colour depending far more upon the substance than upon the amount of silver present, a paper sized with starch and resin giving an entirely different range of colour than one of gelatine hardened with alum.

From my experiments with sensitised and unexposed albumen paper, I estimated that one sheet would, on an average, contain 17·78 grains of metallic silver. Messrs. Haddon & Grundy, in their analysis, found 18·36 grains. The sample of paper, method of draining, &c., would easily account for this slight difference. Those gentlemen exposed a sheet of this sensitised paper for ten days until it was bronzed as far as possible, and yet they only found 3·08 grains of silver, after the paper had been through the fixing bath and washing waters, out of the 18·36 originally contained in the film. Professor Hardwich, in a blackened sheet of paper, could only find less than half a grain of metallic silver. I think the reason of the difference in results is this, Professor Hardwich most probably only darkened the film to the point just short of bronzing, which would be the stage reached in practical photography, because the best printing result to be obtained on an albumen print is from a negative of sufficient density for the darkest shadows to be just beginning to pass into the bronze stage—in other words, to the point where there is only the faintest *visible metallic* deposit of silver on the surface of the paper.

Messrs. Haddon & Grundy evidently carried the exposure of their paper far beyond that stage, and it is wonderful that the dense metallic deposit found on a deeply bronzed sheet of paper does not consist of more than an additional two and a half grains of silver.

I believe that, if those gentlemen were to expose a sheet of paper to the point that I think Professor Hardwich must have done, they will find that he was about correct. They may find about three-quarters of a grain of silver in the sheet, but I think not much more. In the early days of albumenised-paper printing, they floated the paper on equal parts of albumen and water, and there would not probably be so much silver bound up in the film during the coagulation of the albumen, and in consequence the prints would be more perfectly fixed.

Some prints which I have seen, produced by Professor Hardwich himself more than forty years ago, and in the preparation of which I know he took every care—in every one of them there showed that fatal yellowing of the whites of the picture, proving that, even with a diluted albumen film, it is practically impossible to remove the whole of the silver, even when not exposed to light.

It is most gratifying to know, now that gelatine is so extensively used as the vehicle for the photographic image, that this serious drawback to silver printing is practically removed.

HERBERT S. STARNES.

THE CAUSE OF "DEVILS" OR PITS IN PHOTO-ENGRAVED COPPER PLATES.

[Journal of the Society of Arts.]

THESE pits I believe to be due to particles of inferior metal left in the copper from imperfect refining, or forced into the plate mechanically during the rolling and hammering. The impurities, generally iron or zinc, are attacked much more rapidly than the copper, probably from local galvanic action, and the evil is intensified if the solution contain a large excess of free chlorine.

Messrs. Hughes & Kimber, the well-known firm of copper-plate manufacturers, tell me that they are obliged to reject many sheets of copper on account of these specks, technically known as "spelter."

If a plate cut from the same sheet as one affected with "devils" is examined carefully by reflected light after it has been cleaned with whiting, these spots will be seen as lighter silvery specks; and, if the plate is then held over the fumes of ammonia until the copper has acquired a decided tarnish, these specks will be still more easily recognised. Although I am unable—from the nature of the trouble—to state a remedy, this simple test will enable workers to avoid the trouble. Plates showing the silvery spots should be returned to the maker; they are quite suitable for mezzotint, or engraving with the burin, but useless for our purpose.

With regard to the etching solutions, it seems to me that the more simple and stable the composition of these solutions the better. The photogravure process is already hedged in with too many elements of uncertainty to render it desirable to introduce another if it can possibly be avoided. What we require is a set of solutions capable of attacking the copper evenly, and a power, under our control, of limiting the time of biting on any particular tone of the picture. A set of solutions of pure anhydrous perchloride of iron, Fe_2Cl_6, dissolved in cold rain water, fulfils these conditions perfectly, and can be relied upon to act with certainty, but the cost of the pure salt is prohibitive. In the *Manufacturing Chemist* I see the ordinary solid perchloride is quoted at 1*s.* per pound, and the pure neutral sublimed at 10*s.* 6*d.*

A solution of the commercial article will usually be distinctly acid, *i.e.*, contains an excess of free chlorine, attacking the copper with uncontrollable energy, and is liable to cause the resist to blister and rise from

the plate; on the other hand, an excess of iron is undesirable, as it hardens the gelatine in patches, slows the etching, and causes the solution to attack the copper unevenly.

The commercial forms of ferric perchloride are as follows:—

1. The anhydrous perchloride of iron, Fe_2Cl_6, Mol. weight 325, prepared by passing chlorine gas over heated metallic iron. Fe_2Cl_6 condenses on the upper part of the vessel, as small, dark, iridescent crystals, red by transmitted, green by reflected light; exposed to the air, it rapidly turns yellow and deliquesces. Ferrous chloride, $FeCl_2$ will be found adhering to the remaining metallic iron as light buff scales.

2. Metallic iron is dissolved in hydrochloric acid, and chlorine gas passed through the liquid to saturation; the ferrous is converted to the ferric salt. The free chlorine is then removed by passing a stream of carbonic acid gas through the warm liquid. On evaporation, the solution yields a mass of fine yellow crystals, having a formula $Fe_2Cl_6 12H_2O$, or, more rarely, a red salt, $Fe_2Cl_6 5H_2O$.

3. The liquid. The official solution of ferric perchloride of the B.P., prepared by dissolving iron in hydrochloric acid, and adding nitric acid until the black colour first produced disappears, resulting in a very dark reddish brown liquid, its colour being due to the solution of *a* N.O. in a portion of the ferrous salt. This trace of nitric oxide renders this form the least desirable for our purpose.

If we boil a solution of Fe_2Cl_6, as recommended by Mr. Denison, some hydrochloric acid is evolved, depending on the degree of concentration of the solution, and a dark solution of ferric oxychloride remains.

Mr. Wilmer recommends boiling the dilute solution with commercial red oxide of iron. Here, again, we have uncertainty, as the commercial oxide formed by roasting sulphite of iron (Fe_2O_3) is nearly insoluble in the solution, and the change would be almost entirely the result of heat.

Freshly precipitated ferric oxyhydrate, $Fe_2O_2 2HO$, is, however, very soluble in the solution, nine molecules of $Fe_2O_2 2HO$ being dissolved by one molecule Fe_2Cl_6.*

The solution I have found most suitable is prepared by dissolving the solid salt in cold rain water. If the salt is tied up in coarse canvas, and suspended in the jar near the surface, the solution will reach 42 Baumé in about forty-eight hours, and it will smell strongly of chlorine. Now expose to the action of the air in a large dish (do not have more than half an inch of solution) in a well-ventilated place, and in forty-eight hours the solution will have become transparent, and the free chlorine have passed off. Now refilter, and make the various strengths by adding cold filtered rain water.

The addition of alcohol seems to me also undesirable, as, unless the solution be acid, it causes decomposition, with the formation of insoluble oxychloride of iron; even if acid, the solution slowly loses colour, ferrous chloride and chlorinetted ethereal bodies being formed.

E. Sanger Shepherd.

PHOTO-CHEMICAL NOTES.

Molecular Change in a Silver Amalgam.

In a paper read before the Chemical Society, Miss Fannie T. Littleton draws attention to a rather remarkable property possessed by silver amalgam. This body, which is formed by the union of the metals silver and mercury, is in its ordinary condition a perfectly homogeneous pasty mass. It now appears that the amalgam, if shaken violently in a bottle, or if rubbed for some considerable time in a porcelain mortar, undergoes a curious transformation. A quantity of a black powder appears on its surface, or rises from the latter as a cloud of dust. If the amalgam, which has been thus altered, be heated over a lamp, it exhibits a notable increase of volume, and the surface presents the appearance of a body from which gas is escaping. When it has cooled, the amalgam is found to retain this increased volume, and instead of being soft and pasty, as in the first instance, it is hard and crystalline in structure and porous throughout its mass. The black deposit, formed on the surface of the amalgam, consists of the metals silver and mercury, together with a small quantity of mercurous oxide.

It is difficult to account for this curious behaviour of silver with mercury. It might be imagined that, when amalgamated with mercury, silver is able to absorb oxygen in the same manner as it does when in a molten condition, but the authoress's experiments show that the swelling of the amalgam is not caused by escape of any gas. The action can therefore only be ascribed to a molecular change taking place in the mass. It is known that silver and mercury have a considerable affinity for each other, witness the heat developed in the formation of silver amalgam. Moreover, the numerous allotropic forms in which silver is capable of existing, and the various forms of loose combinations into which it is capable of entering with bodies of all descriptions, render it probable that the black compound here in question is one or another form of physically altered silver in intimate mixture, or possibly in chemical combination, with metallic mercury. These facts are of distinct photographic import. The most reliable method of intensifying negatives leaves the image of a composition which is usually assumed to be an atom of silver associated with an atom of mercury. It cannot fail, therefore, to be interesting to inquire whether there is any chemical combination existing between these two bodies, since a knowledge of whether that is the case or not must throw some light on the chances of the permanency of the deposit.

* Bloxham, *Chemistry*, 1894 ed.

New Developing Agents.

In a paper "On the Reduction of Aromatic Nitro-derivatives in Neutral Solution and the Formation of Aromatic Hydroxylamines" (*Bull. Soc. Chimie* [3], 11, 1038–1045), Messrs. Lumière Bros. and A. Seyewitz describe the formation of a class of substances which act as developers of the latent photographic image. Hydroxylamine is well known as a developing agent, and it will be readily understood what is the chemical constitution of the class of compounds obtained by the authors of the above paper when we say that they consist of hydroxylamine, NH_2OH, in which one of the atoms of hydrogen has been replaced by one or other of certain organic radicles, such as phenyl, C_6H_5, tolyl, $C_6H_4CH_3$, &c. These compounds are produced by the action of zinc dust on the boiling neutral alcoholic solutions of the corresponding nitro compound. Thus, for example, para-tolyl-hydroxylamine is obtained from para-nitro-tolnol.

$C_6H_4 \begin{matrix} NO_2 \\ CH_3 \end{matrix}$ Para-nitro-tolnol. $C_6H_4 \begin{matrix} NH\,OH \\ CH_3 \end{matrix}$ Para-tolyl-hydroxylamine.

By the reduction of a number of different nitro compounds a number of hydroxylamines have been obtained. They all, however, possess properties very similar to those of hydroxylamine itself. Para-tolyl-hydroxylamine crystallises in white flakes, which are soluble in water. With hydrochloric acid it forms a hydrochloride difficultly soluble in water. In alkaline solution it possesses very strong reducing powers, and instantly, and without the aid of heat, effects the reduction of a number of such compounds as mercurous chloride, silver nitrate, copper chloride, and arsenic acid.

It remains to be seen whether Messrs. Lumière and Seyewitz can sufficiently load the molecule of this class of body so as to produce a serviceable and valuable developer. If this can be done there can be no doubt that a developer of this composition could be produced at a price which would compare very favourably with that of the reagents now in use, inasmuch as the nitro compounds from which it would be made are already manufactured on the large scale for dyeing purposes.

Nitro-cellulose Filters.

It is often desirable to filter certain liquids through media from which they can take no organic contamination. Thus, a solution of potassium permanganate when filtered through a paper filter experiences a perceptible amount of reduction. A solution of silver nitrate, also, if left long in contact with paper in daylight, precipitates a portion of its silver in a metallic state.

Ignited asbestos is generally used in such cases as these, fine shreds of the substance being packed into a glass tube, through which the liquid to be filtered is poured.

Mr. H. N. Warren (*Chemical News*, April 5, 1895) proposes the use of tri-nitro cellulose as a filtering medium, and from his own experience advocates its employment. The filters of pure paper are immersed in the usual manner in a mixture of concentrated nitric and sulphuric acids, and are subsequently well washed. They are folded exactly like an ordinary paper, and allow the filtration to proceed even more rapidly than that medium.

G. E. Brown, A.I.C.

THE EXAMINATION OF PHOTOGRAPHIC LENSES.

[Photographic Club.]

It has been the habit of the Club to devote one evening in the year to the discussion on lenses. It seems by no means a too liberal indulgence in so interesting a subject. But, when we take into account its natural dryness and the difficulty of handling it in a really entertaining manner, it is but natural that comparatively few of us care to give up a greater number of evenings to it.

I read a paper to you two years ago on *Optical Glass*. You all know how the extension in the manufacture of that article has given a new impetus to the manufacture of lenses; has set the scientific minds of our opticians to work, and has made it possible to produce the splendid

instruments that now are in our hands. I am, therefore, more hopeful now that the chapter of lenses will be more interesting to you than it has ever been before, and thus I have more pluck in approaching the subject, unable as I feel myself to be to handle it in a proper and becoming manner.

Now, I do not propose to bring before you to-night, as has often been done in Photographic Societies, and usually in papers upon lenses, a row of algebraic formulæ or a string of equations interlarded with Greek letters, angles, sines, "pluses and minuses," but to bring everything I have to say within the scope of our ordinary conversational language.

Your Hon. Secretary has put me down for "Modern Lenses." I have thought that, in order to make the paper most useful and interesting to you, I would describe the divers methods of testing lenses, and develop, with the means in my power, the principles on which the tests are based.

I will, therefore, suppose that we are about to purchase a lens—a "modern" one, as that is what your Secretary insists upon—and we want to see for ourselves that we shall have our money's worth.

Of all the tests we can apply, the one that will appeal to our senses best is the one by means of the ground-glass screen; we therefore turn to our familiar mahogany oracle, put her on the tripod, and make her divulge the secrets of the optician's laboratory.

Pinhole Camera.—You are all familiar with the phenomenon presented to us in the pinhole camera. The image projected through a small orifice into a dark chamber has all the qualities of a perfect lens except *one*. There is perfect flatness of field, no aberration, no distortion, no astigmatism, but there is an absence of the one thing without which the others are no good to us—there is want of light.

It has been said that there is no focus to the pinhole projection; this is not correct. Every aperture has in relation to the distance of the screen on which the image is projected a proportionate greater or lesser sharpness of image.

For instance, at eight inches a hole of three-sixteenths will give the sharpest image, provided it be round and sharply cut, and of the thinnest possible material. This proportion represents the least deflection of the rays of light compatible with the admittance of diffused light into the dark chamber. There is another factor interfering with sharp definition—it is the chromatic aberration, which comes in already in this primitive mode of projection, for the violet and blue rays are deflected more than the green and yellow rays, a circumstance which also tends to make the image unsharp.

The pinhole camera may, therefore, be relegated to the department of scientific curiosities and toys, and though photographs may be taken with it which have a certain scientific interest, or may serve as a basis for chiaroscuros and fuzzotypes, no one has yet been deterred by these pictures from buying the lenses he intended to acquire for his work, or, like Diogenes, throw away his tool as useless, when seeing another attain *his* end without it.

The insertion of the Lens into the Camera gives us the light we require, and brings with it the above-enumerated defects which it is the scientific optician's duty and task to diminish, or entirely to eliminate.

Focus.—When we handle a lens, the first question that will occur to us is, What is its focus? We can take almost no interest in it without knowing the focal length, for from it depends the judgment that we form of its usefulness with regard to angular aperture, angle of view, size of image, &c., and we will make this our first consideration.

Focus is the distance between one of the principal points to its corresponding nodal point along the axis.

In a plano-convex, this principal point is on the convex surface, in the line of the optical axis. When we have such a lens—which may be a single landscape lens—we can apply a foot rule and measure the distance, and the thing is done. With all other forms of lenses it is different.

Most of you know that every lens has two nodal or principal points inside, and two outside; all light pencils act as if they were broken (refracted) at the first plane, from whence they seem to be going straight (that is, parallel to the axis) through the lens, and break again at the other plane.

For every form of lens these planes shift, and though they are usually inside the body of a system, they are in some cases on the outside surface, or entirely outside of it. A doublet, especially a symmetrical one, acts in this respect exactly like a single biconvex lens, and its principal points may be, and mostly are, on one and the other side of the so-called optical centre.

Measuring from the diaphragm, and dividing the aperture of it into the so measured focal distance, is therefore a proceeding based on *two incorrect data*, and tells you neither the focus nor the intensity correctly.

As we can, however, not measure by the simple means of a foot-rule right through the body of the lens, other means must be found.

The law of conjugate foci here comes to our aid, and knowing (as we do) that a subject is projected in its natural size at twice the focal distance, we have the means of measuring absolutely correct focus entirely outside the lens itself, and without disturbing it in any way.

It has been recommended to focus an object at its real size, and to measure from the object to the image and divide by four. This is approximately correct, but in some instances would be out by an inch or so.

The principle applied to correct measuring of the focus is that an object at a distance (not less than 300 foci) has its sharp image at the equivalent focus, while for an object whose image is focussed to a size equal to the object itself, the distance is exactly twice that of the equivalent focus. We have thus *two focal* lengths either side of the corresponding nodal points, and if from them we deduct one, having previously ascertained it, we have the absolute focal length left. The slide and diagram illustrate this.

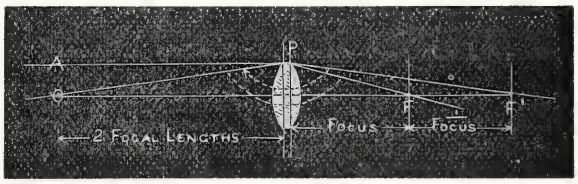
In my practice I cut a piece of cardboard, say, four inches square, out of which I cut a square two inches; this is put against the window and the camera racked out until the image is exactly the same size in the centre of the focussing screen, which has been marked with two and four inch squares.

This slide shows the underlying principle which is admirably laid down by Steinheil in his treatise upon lenses, when he traces the focus from the plane which lies in or near the lens perpendicular to the axis, where all light coming from a distance as parallel rays is refracted towards the axis to the point where such ray of light *cuts* the axis.

Demonstration by Deflected Beam.—Each lens has, according to the law of refraction—depending on its curvature and material—two fixed points on either side along the axis, which determine the angle at which it bends (refracts) the light; this angle is a *constant* factor for *all cases*. I illustrate it by this rule bent to a given angle at its joint, and all focal images formed by one lens are projected under the one invariable angle.

I know of no better practical illustration than this.

Some years ago Sir H. Grubb gave a diagram in The British Journal Photographic Almanac, illustrating the law of conjugate foci by a straight moving beam within a small angle on a point at the corner of a small square, the sides of which represent the exact focus of the lens.



This bent beam or rule illustrates it, in my opinion, better still, as it shows the angle at which the light is deflected and the law that this angle is always the same. If you follow the movement of the two arms of the beam as they are rotated, you see that in position A one represents light coming from the distance refracted at P, the principal plane, and crossing the axis at F. Now rotating this two-armed rule until the posterior arm cuts the axis at F′ at twice the distance from the plane P, we find that the anterior arm has reached the crossing point O on the other side at exactly the same distance, viz., two focal lengths. It is evident that every intermediate conjugate could be read from the diagram; we have only to mark our axis out by inches and read the foci off for every measurable distance.

You will observe that we have left out of consideration the thickness of the lens. There are two planes within each lens, and their distance from one another would have to be deducted from the result if we were to measure from point O to F′—that is, from object to focus.

When I say that this principle holds good for every lens, some might ask whether such a lens as the tele-photographic is included. I say yes, it is, but with this difference, that the plane of its principal point is entirely outside the combination and a long way in front of the front lens, but, as slide shows, subject to the same principle.

I wish now to show you another method of obtaining the exact focus, the principle of which rests upon the fact that an image on the ground glass remains steady though the lens is rotated on the vertical axis of its posterior nodal point.

This is demonstrated by Moessard's "Tourniquet" which I have here, and which has been kindly lent me by the Royal Photographic Society.

Here we have an arrangement by which the vertical axis going through the principal point from which focus is measured, can be found by adjusting the lens carrier through the means of a screw rod. When this is found, the image of an object in the axis is perfectly steady; any movement will indicate that the lens is not in the right position.

When the lens is too far out, the nodal point in front of the axis A, B, the image will move in the contrary direction of the handle C, by which the lens is rotated; when the image moves in the same direction the nodal point is behind the axis A, B, and the lens has to be racked out until the image is steady when the lens is rotated.

This instrument, of which slide gives the diagram, is useful not only for finding the focus, which can be read on the scale behind screen, but also for most of the other tests to which I shall refer later on.

We have now ascertained the exact focus, and gone through the principles governing it, and if you find that I have been a little more explicit about it than some thought was necessary, I have done so because I have seldom found an amateur who would exactly measure the focus of his lens, nor a professional photographer who did so by a scientific method. Without wishing to say anything disparaging of the Club, I would venture to say that, if I brought a lens down here and asked, say, six of you, to ascertain its focus by next Wednesday, probably half-a-dozen different results would be given.

Having now dwelt with the matter of focus, we next take the

Angular Aperture.—We have seen that in the pinhole camera the aperture must of necessity be small. With the insertion of the lens, we shall in a degree gain that quality essential to our purpose—light.

The amount of light admitted and refracted through a system of lenses is measured by the angular aperture. Generally speaking, the angular aperture is understood to be an angle, the apex of which is the focus on the axis, the base the diameter of the front lens admitting the light.

In landscape lenses the diameter of the stop in front of the lens determines the volume of light. In a doublet, the diameter of the front lens—provided, first, that all that light can pass through the diaphragm fixed in the mount, and that the construction and mount of lens offers no impediment by cutting off some of the marginal waves.

The light in a single lens is not condensed when it reaches the stop. In a doublet the light going through the stop is condensed light, and taking it as the same volume of light as has penetrated the front glass, the aperture of stop will on an average represent a volume of light ten to twelve per cent. greater than its diameter.

The angular aperture, therefore, in a doublet, is not found by measuring the stop, not any more than the focus by simply measuring the distance from the stop to the focal plane.

In order to obtain the exact value of the volume of light admitted, we have recourse to the principle already worked out of the conjugate foci. We simply reverse the logic of it, and turn our focal plane into the "luminous object;" and we know that as a luminous object at distance will send parallel waves of light on to the lens, which cross at the principal focus, so will a luminous point at the focus send out parallel rays from the lens forward. We, in fact, use our lens as a condenser.

We proceed as follows:—

Over the lens we put—inside cap—a circular disc of bromide paper as large as it will hold; into the focal plane—slide—we insert a piece of cardboard, cut to the size of plate, with a hole in the axis about one-eighth of an inch, or smaller. We now, having set camera to focus, burn a few inches of magnesium wire directly behind the hole in the board, and we shall obtain on development of the bromide paper an image representing, by a black disc, the exact volume of light, the diameter of which is the basis of our angular aperture.

The Aberrations: Spherical and Chromatic.—Having acquired the necessary data of the two principal constant factors, we may now examine our objective for any faults that may be left uncorrected.

Spherical aberration should not exist in any modern lens, and any lens showing it to any extent should be looked upon as a duffer.

Lenses of comparatively long focus do not suffer much from this defect, but spherical aberration is a trouble increasing when the curvature extends over a larger spherical surface, the difficulty being to bring the marginal rays to the same focus as the central.

Images will thus be indistinct, because when focussing for the central rays we shall have a disc or halo, formed by the marginal rays which have focus nearer the lens, and are already spreading out again, as shown in diagram.

Test.—In order to detect this fault, we focus sharply on a bright object, such as the one I have brought down, hung up, say, at a distance of twenty to thirty feet.

Should any indistinctness in the image appear, we insert a stop about one-half or one-third of the full aperture. When spherical aberration is present, the halo around the sharp image will diminish, or disappear altogether; this behaviour, therefore, will prove to us spherical aberration which may be both positive or negative. Having now got rid of the halo, we rack forward so as to bring our screen into the plane of the focus of outer rays, but having eliminated them from the image, they will not trouble us, and we shall simply see our image take the form of a slightly larger disc on the screen. Should we see a sharp central image rather smaller than the one in the other plane with halo, it will prove that we have not cleared the marginal rays sufficiently out of the image, and shall, in order to obtain sharp focussing, have to stop down more.

I have here only spoken of axial spherical aberration. It will be understood that the same fault may or will probably be observable all over the plate, most likely in a greater degree, and, what is worse, will be mixed up with chromatic aberration, astigmatism, and so forth, so that it will be difficult to tell which fault is the prevalent one.

Theoretically, the form of lens having the least spherical aberration is the plano-convex; but spherical aberration has, like chromatic aberration, to be corrected by the superposition of two lenses of opposite character, the fault of the one correcting the other.

This correction is, moreover, bound up with the one for achromatism, for as you will easily see the alteration of any curvature in order to correct one aberration will also affect the other.

A system corrected for both spherical and chromatic aberrations is called aplanatic.

Chromatic Aberration and Chemical Focus.—You are, no doubt, all acquainted with the spectrum, and the principles governing the dispersion of light through prisms and lenses. Long after the achromatic telescope had been constructed by Dollond, photography remained in infancy, and lenses were mostly beset with the grave fault of giving coloured images in the sense that one colour would form one, and another colour another image, these overlapping one another and being in different planes from the lens.

They often had, until quite lately, chemical focus, or suffered from chromatic aberration.

The difficulty of achromatising lenses, say, of two elements perfectly, arises from the difference in their spectra, and, as I have shown here before, the difference not going in the same proportions as the difference of their densities.

That is to say, two glasses, like ordinary flint or crown, have a refraction which stand in the proportion of 1·63 for the one to 1·52 for the other, while their respective dispersion stands about 0·0124 to 0·0066; the proportions of one is 5 to 6, the other nearly 3 to 5. This condition of things is now considerably modified by the introduction of new glasses of more varied dispersive properties in relation to their refractive powers, notably some of the glasses with a high refraction and a comparatively low dispersion.

When we look at the spectrum of flint and crown, we see not only the difference, but the impossibility of bringing both into the same proportions all along the line. Having them agree from C to F, they will agree neither at the lower end where the crown has it, nor at the higher end where the flint has it.

If we include the yellow and orange, the red may for most purposes be neglected, as it has little or no effect on the photographic plate except in the case of orthochromatic work, when we have plates sensitive to red; but more trouble arises with the blue and violet light. This we can hardly see on the screen, but it acts most effectively on the plate, and the residue left uncorrected will be most detrimental to our obtaining sharpness in actual work.

In examining a lens for achromatic aberration, we find ourselves confronted with the difficulty that when the fault is small the foci are close together and flow into one another again, forming a white image; moreover, when lens is under-corrected we easily obtain sharp focus for the visual yellow rays, but the blue and violet are, or may be, hardly visible to the eye, while when we expose our plate it is *they* who do the work whilst our yellows do nothing, or very little, during the time that exposure lasts for the other.

Over-correction will be the lesser evil, because the blue light is not likely to be so spread as in the case of under-correction, and the whole pencil is closer together; the error, therefore, is not likely so great.

This is shown by slide.

Should a lens show signs of chromatic aberration, it should be returned to the maker for correction, which is obtained by regrinding the inner surfaces, for no amount of stopping down will correct the fault.

Test for Chromatic and Spherical Aberration.—A doublet should give a sharp image over a certain angle with its full aperture.

Two scales are used—such a rule, as one here, which should be new and clean, may serve the purpose; one is put up at right angles to the axis of lens—horizontally or vertically, the other at an incline of 45°—horizontally or vertically. The scales on rule must be well visible.

Put camera at a distance of five to six focal lengths; focus for the number on scales at which the two cross, see that on the inclined scale the same number of figures are distinct on either side of centre.

When sharply focussed, with full aperture, expose a plate. When the same number that was focussed for is sharpest, there is no fault with regard to colour correction. If a number is sharpest that is nearer than the centre, then there is chromatic aberration, the chemical light having a shorter focus than the visual, and the lens is under-corrected; in the contrary case it is over-corrected. The over-correction will, as I have said, practically be a less serious fault than under-correction.

Now expose a second plate for a second test. For this purpose nothing is altered but the aperture—make sure that you are still sharp at the crossing point. Insert stop, say, *f*-16 in a rectilinear with an aperture of *f*-8. Expose—develop.

The centre should again be sharpest, if not there is spherical aberration, because, when a more distant point is sharp, it proves that the axial rays have a longer focus than the marginal.

In the opposite case the spherical aberration is over-corrected.

Zeiss's (Dr. Rudolph's) Focimeter.—This consists of a rail or rod in horizontal position, at right angles to the axis, on which are erected a number of sticks radially pointing towards the lens. On each of these are stuck some labels bearing letterpress or lines, and in such a manner that, seen from the lens, all are visible; thus some will be upright, others at angles of 45° and 90° from the upright position, or at 30°, 60°, and 90°. On these labels the corrections—spherical and chromatic, the depth of focus for each aperture, the curvature of field, the covering power with each stop, can be measured and tabled.

When focussed on central rod, and for central label, it is easily seen what the area of sharp definition amounts to in both directions, vertically to the axis and parallel to it. You can judge of the curvature of field, find out whether chromatic and spherical aberration are properly corrected. Get at the general covering power, or even at the approximate amount of astigmatism. It is a good universal instrument, and it is specially suited to our purpose, as it represents a system of objects at different distances and in different angles to the axis of the lens.

Flatness of Field.—Having treated the aberration of the central rays, we now come to those lying at an angle to the axis. The theoretically perfect lens is supposed to give a perfectly flat image over the whole of the disc which it is able to light up of a flat object. No lens does this.

The rays falling obliquely come to focus on a curve, and we have to

see that this curve is reasonably large to allow us to obtain sharp images over a sufficient size of plate. The theory teaches us that the principal plane in which the marginal rays are refracted must be more convex towards the object and concave towards the image, and that the diaphragm must be in the place where the axis of the oblique rays cuts the axis of the axial rays. These are the best conditions for a flat field. Some excellent lenses have rather round fields, and it is a question for the maker to decide how much correction he will introduce in order to flatten the field without introducing too much astigmatism.

Our task is not difficult. An ordinary camera will suffice. We put the camera on its stand, focus in the centre for our test object, and then rotate it, noticing the amount of rotation we can do without throwing our object out of focus.

Again we turn to the instrument specially constructed for these tests, the "Tourniquet." Having lens in the right position, we take a luminous point, the best is our white silver ball. We focus sharply for it on centre. Now rotate lens 10°, 20°, 30°, and for every angle see how much we have to rack in, in order to maintain the image perfectly sharp; as we have a scale, we can read off exactly how much we have racked in. We can mark the points off on a plan, and, having our points at the angles of view for which we tested, can construct the curve representing the exact amount of curvature.

Again, we may use Dr. Rudolph's arrangement, and we can with it see at one time how far three points (one on centre and two on side) will focus together, or place them in such a position that they are all equally sharp, and then measure the amount of curvature which they would represent, and thus obtain the size of plate which our lens covers sharply with a given stop, and the gain for each stop.

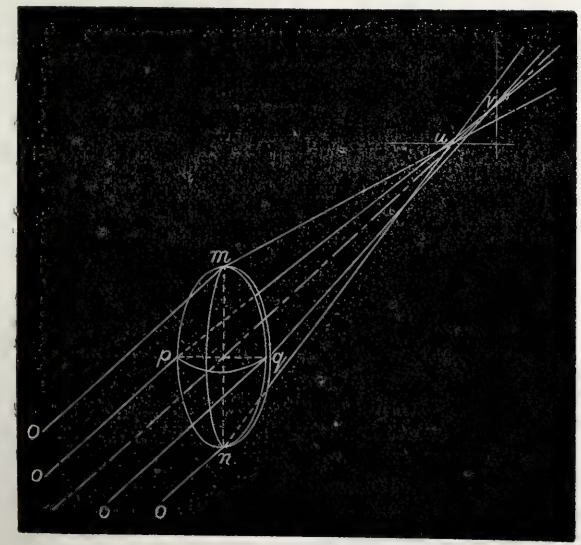
Astigmatism.—Astigmatism is one of the most interesting phenomena we have to deal with when examining the images of lenses. It may be defined as an aberration of the marginal rays in which out of a pencil of light those that fall at two opposite planes, for instance the horizontal and the vertical, cannot be in focus together. It is a thing which has lately had a great deal of attention paid it at the hands of the scientific and manufacturing opticians, and its pretty nearly complete elimination from our images has given us a much wider range of possibilities between angle and corresponding intensity of illumination.

We have, as you are aware, two astigmatisms—the one of the human eye arising from the irregularities of the eye, and the one of glass lenses arising from the circumstances of their application. The two are of a different character, but not so different in nature as we are sometimes led to believe.

Astigmatism of the eye is, in fact, physiologically considered, very much of the same nature. When light from an object at moderate distance strikes the eye with this defect, the eye, having two different curvatures, and consequently two different foci, cannot bring waves from a horizontal line to focus at the same time with waves from a vertical, and *vice versâ*. The eye will, of course, adjust itself to either one or the other by means of its muscular arrangement. The photographic lens has no such power. The only known way is to stop it down, and that means extends only over a limited field.

The later perfections, however, permit of astigmatism being nearly effaced from our objectives by the superposition of lenses having opposite properties as to their dispersive and refractive powers, and thus include this troublesome phenomenon in the corrections.

We will now suppose a pencil of light coming from a point at 33° sidewards from the axis strikes the lens, is refracted, and projected on to the focussing screen. You will see at once that when you cut two sections of



this pencil of light—one bound by the lines $o\,p$, $p\,q$, and $q\,o$, and one bound by the lines in black $o\,m$, $m\,n$, and $n\,o$—the two sections show a difference with regard to the line in which they strike the lens. If our point is below the axis, but in the plane of it, the points on the line $p\,q$ will be symmetrical as regards their position towards the centre, while those on the vertical $m\,n$ will not be so; the two lines $o\,p$ and $o\,q$ stand at the same angle to the lens, the lines $o\,m$ and $o\,n$ do not. The result is that the lines of one section cross at different points from the lines of the other section—that is to say, they have a different focus. The one comes to a focus at v, the other at u. That is astigmatism of the photographic lens.

We will now, for the better illustration of the subject, suppose that the disc on our next slide is at right angles to the plane of the vertical section of the pencil of light in the plane of the screen on which it is projected. If we have light from a point below in the same plane, then the light enclosed by the red lines will strike the lens, as it were, symmetrically, while the light striking it at right angles does not.

The light from the rays lying in the plane of the screen (point below) comes to a focus where the black lines cross, and the light from the red behind where the red lines cross, while the red lines at the crossing of the black lines will form a line for every point of the image instead of a sharp spot.

When we suppose our luminous point to be to the left or right of our screen, the parts of the two planes are reversed; in fact, the same thing holds good for any two sections at right angles.

Astigmatism could only be cured by allowing a certain amount of curvature of field, for the two corrections were antagonistic to one another.

Our object, however, is to see what residue of astigmatism we have left in our lens, and to know what are the effects of its presence in the lens upon our image on the screen.

Let us take our object, the silvered ball, and focus it, say, on an ordinary camera, in the exact centre of the plate, coincident with the optical axis of the lens. It will there show as a small disc or bright point. Now rotate camera, say, 25 to 30°, or, without taking notice of the number of degrees, bring the image to the edge of the plate; we shall probably find that the image has assumed the shape of a cross, or something near it, such as the slide shows.

We now rack forward, and shall soon find our cross take an elongated shape of a stroke. If we mark how much we have racked out, we have the difference between the ideal focal plane (the focussing screen) and the focus for the one section of rays. We now rack backwards past the focussing plane for the centre, and find our image shaped in the opposite way. The distance between the two is the astigmatic error of the lens.

Probably the first figure will be considerably more in front than the other will be at the back; or it may be that the two cross one another, say, at 30°, in which case we shall have no astigmatism at that angle at all. Such a lens is the one in Zeiss' list classed under Series f-$\frac{1}{9}$, III.

The lens at this angle is at its best, and I may say that, if such a point is found in any lens, it should at once be noticed, and no attempt made to cover a much larger plate than the one included in that angle, for no amount of stopping down will do much good beyond the crossing point.

We may also apply such an apparatus as the one designed by Dr. Rudolph; we can at once see within what angle we can obtain sharp vertical and sharp horizontal lines, and how far we can increase that angle by stopping down. We can observe whether we have any astigmatism at all at a narrower angle than, say, 30° from the axis, and, if so, whether it is on both sides of the general field or not, and at which angle the two curves cross, if at all.

Astigmatism will interfere not only in architectural subjects or copying, but also in landscape and portrait photography. In the former, foliage will often take a flattened form, being drawn out horizontally, or, in other cases, vertically, like the branches of a poplar-tree. In portraiture, the patterns of a wall paper will appear all distorted and streaky, instead of showing the scroll or diagonals of its pattern.

Now for the curve.

Astigmatism has long been the bugbear of lens-makers. Partial corrections have been made repeatedly in the different forms of lenses.

Steinheil, when introducing his aplanatic lenses, was well aware of its damaging effects, and made a brave attempt to cure it. He bettered his attempt again in 1881 when introducing the antiplanet. Dr. Schroeder directed his efforts also against astigmatism in the construction of the concentric lens, for which special glasses of Jena make were used; but the main attack was delivered by Dr. Rudolph in the construction of the anastigmat, which really may be said to be the first lens that eliminated it from the field.

As you know, the means to it were obtained through the greater choice in the glasses applicable to the purpose.

He obtained this remarkable advance by combining two glasses of opposite properties; the one with a great refractive power and comparatively small dispersion, against another with a small refractive power and greater dispersion. Thus the crown had a high index and the flint a low index, to which he added a crown of medium index.

This mode of correcting opened up a new area for lenses, and since then the principal optictians have been busy making use of the new material at their disposal, and ring the changes on this mode of correcting the astigmatic error; and we have to-day a number of new forms of lenses all arising out of the application of glasses, whose properties allow com-

binations that were impossible before, or, if possible, were not carried out in such a masterly manner as Dr. Rudolph has done it.

I have now dealt with the principal points, and fear that my paper is getting unbearably long, but you will excuse my having given particular attention to this chapter on astigmatism. I have often heard it talked about in photographic societies, but never have seen it tackled at close quarters, and think that mostly very vague ideas were abroad as to its real nature amongst amateurs generally. I therefore took the opportunity to go into it somewhat thoroughly, believing that it will be of service to many of my hearers. It now remains to speak of one more defect often found in the best of lenses, namely, flare spot. J. R. Gotz.

(*To be continued.*)

PLATINUM TONING: MR. J. KIDSON TAYLOR'S METHOD.

[Photographic Record.]

The paper I now use is the Ilford P.O.P., which is subsequently matted on the finest ground glass.

The paper should be printed slightly deeper than the tone required in the finished print, but must not be carried so far as to block out the detail in the shadows.

The untoned prints are to be kept as dry as possible, preferably in a calcium tube, and all touching of the surface by the fingers must be carefully avoided through all the subsequent processes.

They are then to be most thoroughly washed in many changes of water, the first washing water being changed as quickly as possible; when all milkiness or opalescence has disappeared, they should—to eliminate any trace of free silver remaining in the paper—be passed for a few minutes through a bath of common salt, one ounce to twenty ounces of water, before being transferred to the toning bath (the time they are left in the salt bath beyond two or three minutes is of no consequence), they are then placed two at a time, back to back, in the toning bath.

The toning is composed of—

Chloroplatinate of potass (*Harrington's*)	5 grains.
Sodium chloride (common salt)	50 ,,
Citric acid.....	50 ,,
Distilled water.....	30 ozs.

This bath will keep indefinitely, and only requires the addition of half a grain of platinum to each sheet of paper toned to keep in working condition.

My practice is to tone by time, giving from three and a half to five minutes, and in some cases, where a dark tone is required, up to ten minutes, the change of tone not being very perceptible, unless compared with an untoned print.

When toned, the prints are immediately transferred, without washing, to an alkaline bath, made up of carbonate of soda crystals, half ounce to forty ounces of water; in this bath they may remain till all the prints are toned, the time being immaterial. This bath will turn the prints from red brown to violet, and it must on no account be omitted, as the resulting colour entirely depends on its use—it is most important.

From this bath the prints are to be placed again without washing in the fixing bath.

With regard to the fixing bath there are many diversified opinions. My practice differs considerably from that in general use. What you will, doubtless, consider very heterodox is that I prefer an old used bath, as I feel sure, without prejudicing the permanency of the prints, I by its use preserve, to much greater extent than by using a freshly mixed bath, the delicate half-tones so necessary in a well-graded picture.

The bath I use is made up as follows:—

Hyposulphite soda	4 ounces.
Sulphite soda	2 ,,
Water	40 ,,

made alkaline with one drachm, 880 ammonia.

In this (a used bath) the prints should remain for from 20 to 30 minutes, being constantly separated and rocked the whole time, my theory being that the permanence of the prints depends quite as much, if not even more, on very thorough fixing as on the final washing. Immediately, on being placed in the fixing bath, the violet tone they have acquired in the soda bath is changed to a decided yellow brown, which ultimately darkens as the prints are completely fixed.

The prints are then washed for an hour in a Wood's washer, and as a final operation are treated for five minutes in a chrome alum bath previously made alkaline with ammonia and filtered, making them much more easily matted, so that in mounting the backing of the prints is unnecessary, as they retain their dull matt surface.

After this bath, which, like everything else should be scrupulously clean, the prints only require rinsing and squeegeeing. It is absolutely necessary to squeegee the prints at once without letting them get at all dry, as it is impossible to soften them again if they are allowed to dry.

The above contains all the information your least experienced workers will require for successful manipulation conditional upon the careful usage and attention to details which every true artist will lovingly give to his work.

Our Editorial Table.

Catalogue of Lenses.

Messrs. A. E. Staley & Co., of 35, Aldermanbury, have sent us their catalogue of photographic lenses. Therein we find listed and illustrated every variety of portrait and view lens, tele-photo objectives, hand-camera lenses, spirit levels, focussing glasses, shutters, flash lamps, and many other articles. This catalogue has evidently been compiled with great care and completeness, and should be found useful by the trade and dealers, for whom it is intended.

Wratten's Sensitised Albumenised Paper.

There are still very many photographers who remain faithful to the use of albumenised sensitised paper, which, to judge from this and other circumstances, notably the advent of several new brands, is likely to find many advocates for some time to come. Messrs. Wratten & Wainwright, of 38, Great Queen-street, recently sent us for trial some sheets of the paper they supply, selected hap-hazard from stock. This we found even and rapid in printing, and readily taking an agreeable and vigorous tone in a phosphate bath. It should be said that the ordinary acetate and other baths are recommended for the paper, whose excellent qualities, combined with the welcome ease and simplicity of manipulation, which is so pleasant a feature of albumen printing, should assure it a continuance of the popularity it has long enjoyed.

Mounting Prints by Rule.

Literally "by rule," as will speedily be perceived when we give a brief description of an ingenious device of the foot-rule genus, invented by Mr. Wilson Noble, M.P., for facilitating mounting.

The centre of the rule is a zero, from which the figures progress to the ends, graduated like an ordinary foot rule. It is sixteen inches over all.

By laying the print on the mount, and placing the rule over both, the print can be instantly adjusted to the centre of the mount, when two small pencil marks are made at the top corners of the prints as guides.

Watson & Sons are the makers of this simple yet effective rule, although, from the description here given, any person may extemporise one for himself with a plain strip of wood.

The Holborn Restaurant, Illustrated.

This is an ornate descriptive guide to this now well-known restaurant, the illustrations being drawn by Horace Morehen, and the descriptive matter written by Frederick Leal. There are no fewer than twenty-two skilfully executed drawings, most of them full page. The descriptions are *en suite* with the drawings, both being alike excellent.

News and Notes.

We are informed that Mr. Birt Acres has resigned the management of Messrs. Elliott & Son's works at Barnet.

Walworth Junior Postal Camera Club.—Mr. Percy C. Cornford, Hon. Secretary, and Treasurer, 36, Inville-road, Walworth, S.E., writes: "There are several vacancies to be filled up in this Club, and I should deem it a favour if you would mention the fact."

We have received the programme of the Eastman Concert given at the Kodak Recreation Society, Harrow. It is embellished with a fine portrait of Mr. George Eastman. Judging from the programme and the performers, the concert must have been a great success.

A Camera Club for Doncaster.—A meeting was held at Doncaster, on the 18th inst., at which it was decided to form a club called the Doncaster Camera Club. The Hon. Secretary is Mr. F. Moat, 48, Copley-road, Doncaster, with whom photographers desirous of joining are desired to communicate.

Photographers' Benevolent Association.—A meeting of the Committee of the Photographers' Benevolent Association was held at the Registered Offices, 6, Farringdon-avenue, London, E.C., on the 18th, inst., Mr. A. Mackie in the chair.—An application for a loan to meet arrears of rent was considered and a grant of 10*l.* made. Two applications for financial assistance were refused, the relief being likely to be of a temporary character. A crippled photographer, who had already been assisted, reported on his position, and asked for a small weekly or monthly grant. The Committee decided that the request could not be acceded to in the present state of the funds. Various suggestions and offers of assistance for strengthening the funds of the Association were considered at some length.

MESSRS. A. & M. ZIMMERMANN, of 6 and 7, Cross-lane, E.C., announce two money-prize competitions, the one for a combined toning and fixing bath for albumenised papers, for which 150*l.* will be awarded; the other for an albumen printing process, to be as rapid as collodio-chloride, for which 300*l.* will be awarded. Replies are to be addressed to Dr. H. W. Vogel, Charlottenburg.

A NEW STUDIO AT BRADFORD.—Spring Lodge, Manningham-lane, Bradford, for many years the residence of the Drummond family, has been leased for a period of years to Mr. Hubert Henry, late of Southampton, who has, after considerable alterations and additions, opened the building as a photographic studio. The reception-rooms, dressing-rooms, and studios are all on the ground floor, lighted throughout with electric light, and replete with every convenience. The whole of the art productions with which the windows and the walls of the various rooms are decorated are the work of Mr. Henry, and include specimens of carbon, bromide opal, platinotype printing, &c. A special feature is the novel arrangement of electric lights, designed by Mr. Henry himself, by which he is able to produce results as satisfactory at night, or during fogs, as by daylight, thus avoiding disappointment, should the weather be unfavourable, when a special sitting has been previously arranged. The arrangement also allows for ladies in evening dress, and business men with little time to spare during the day, to make appointments for any hour in the evening. Previous to opening in Bradford Mr. Henry had the distinction of the patronage of Her Majesty the Queen, the Emperor of Germany, the Prince of Wales, the Duke of York, &c.

A VERY complete and modern installation of the electric light, as adapted to the business of photo etching carried on by Messrs. Carl Norman & Co., has been erected on their premises at Tunbridge Wells. The installation consists of a 6-horse-power high-speed Otto gas engine, which drives a dynamo of the most recent and enconomical type, running at 1300 revolutions per minute, and capable of developing 75 ampères at 105 volts. Highly insulated cables are run, partially in casing and partially at safe distances from each other, from the dynamo to the studio, and a switchboard with the usual measuring instruments is fixed in the engine-house. In the studio are three arc lamps running on the patent overhead travelling gear of the firm who fixed the installation, which is so arranged that the lamps can be raised, lowered, moved transversely, or horizontally, with extraordinary facility. There are two lamps for the transfer process, and one for printing purposes, all governed by the usual resistance coils and switches, cut-outs, &c. The installation was designed, and fitted up complete by Mr. Henry J. Rogers, M.I.M.E., of the Watford Engineering Works, Watford, near London, who has carried out several electric light installations of a similar character for Messrs. André & Sleigh, the Gilling and Walpole Company, &c.

RUSSIAN PHOTOGRAPHIC SOCIETY, MOSCOW.—It is intended to hold in Moscow during the months of February and March, 1896, under the auspices of this Society, a Photographic Exhibition on a large scale. The Exhibition will have the honour of being presided over by H.I.H. the Grand Duke Sergius, Governor-General of Moscow. The time appointed for the opening of the Exhibition has been purposely fixed at so distant a date, partly with a view to enable photographers from all parts of the world to participate without inconvenience, and chiefly on account of the exceptional interest that Russia, and the city of Moscow in particular, will then enjoy in the eyes of the world in connexion with the great event of the coronation of His Majesty the Emperor expected to take place in the spring of next year. In the summer of the same year will be opened at Nishny Nowgorod the Grand Russian National Exhibition, which will also cause a large inflow of visitors to the city of Moscow. The Russian Photographic Society feel assured that in the above circumstances they may safely look forward to a great success for their undertaking, and it is therefore with a sense of confidence that they cordially invite photographic societies, amateurs, and professional photographers of the entire world, and especially of England and America, to take part in the forthcoming Exhibition. A petition has been presented to the authorities by the Russian Photographic Society, which it is hoped will have the effect of relieving intending exhibitors from any difficulties with the Customs department. A jury of experts will be appointed, in accordance with whose verdict gold, silver, and bronze medals, and honourable mention will be awarded to the more deserving exhibits. In addition to this, every exhibitor will receive gratis a silver jeton as a *souvenir* of the first Exhibition of the Russian Photographic Society. During the Exhibition a general meeting of photographers is to be held. All inquiries to be addressed to the President of the Russian Photographic Society, Mr. Vladimir Karlowitch Wulfert, Serebrianny pereulok, No. 9, Moscow, Russia.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 7137.—"Improvements in or relating to Photographic Roller Blind Shutters." J. B. IRVINE.—*Dated April*, 1895.

No. 7187.—"Apparatus for Obtaining and Viewing Chrono-photographic or Zoetropic Pictures." Communicated by A. Lumière and L. Lumière. B. J. B. MILLS.—*Dated April*, 1895.

No. 7188.—"An Improved Photographic Process, giving, without Transfer, Images with the Half Tints, and the Application of this Process to Photography in Colours." Communicated by A. Lumière and L. Lumière. B. J. B. MILLS.—*Dated April*, 1895.

No. 7217.—"Improvements in Photographic Apparatus for Enlarging, Reducing, and Copying." C. S. JONES.—*Dated April*, 1895.

No. 7310.—"Improved Means and Apparatus for Raising, Lowering, and Traversing Arc Lamps used for Photographic and other Purposes." H. J. ROGERS.—*Dated April*, 1895.

No. 7435.—"Improvements in and relating to Obturators for Photographic Cameras." R. DECAUX.—*Dated April*, 1895.

No. 7893.—"Improvements in the Manufacture of Photographic Plates." Complete specification. W. H. C. CLASEN.—*Dated April*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

April.	Name of Society.	Subject.
29	Camera Club	*Egypt and its Monuments.* Horace T. Brown, F.R.S.
29	North Middlesex	
29	Richmond	*The Camera and How to Use it.* Mr. Cembrano.
30	Birmingham Photo. Society	Practical Demonstration of New Optical Lantern, by the Inventor, Frank Alston.
30	Bournemouth	*Some Foreign Practice in Photography.* J. W. Bennett.
30	Hackney	*Small* versus *Large Pictures.* R. Beckett.
30	Halifax Camera Club	
30	Lancaster	
30	Leith	
30	Munster	*A Holiday in Holland.* Major J. D. Lysaght.
30	Paisley	
30	Warrington	
May.		
1	Croydon Camera Club	Photographic Chat.
1	Edinburgh Photo. Society	
1	Leytonstone	
1	Photographic Club	*Carbon Transparencies.* S. H. Fry.
1	Southport	
1	Southsea	
2	Birmingham Photo. Society	
2	Camera Club	*Hand Cameras.* Major J. D. Lysaght.
2	Dundee and East of Scotland	
2	Glasgow Photo. Association	
2	Glossop Dale	
2	Hull	
2	Leeds Photo. Society	*Criticism of Lantern Slides.* E Renard.
2	London and Provincial	*Mounting and Framing Photographs.* W. F. Slater.
2	Oldham	
2	Tunbridge Wells	
3	Birmingham Photo. Society	Last Day for Sending in Pictures for Annual Exhibition.
3	Brighton and Sussex	
3	Cardiff	
3	Croydon Microscopical	
3	Holborn	
3	Leamington	
3	Maidstone	
3	North Kent	
4	Hull	
4	Newton Heath	Excursion: Worsley. Leader, W. T. Evans.

ROYAL PHOTOGRAPHIC SOCIETY.

APRIL 23,—Technical Meeting,—Mr. F. A. Bridge in the chair.

Mr. A. K. TALLENT read a preliminary paper prepared by Mr. A. W. DOLLOND and himself on *The Science of Tone-rendering in Opaque Ink*, dealing with the subject for reproduction, the representation of tone, the method of producing a series of tones, the extent of range of tone in the print, an outline of the process of block-making, the principles of the action of the screen, and other matters.

Mr. W. ENGLAND showed dry-plate negatives prepared for block-making, and thought that, if carefully examined, it would be found that nothing better could be done with wet plates.

Mr. TALLENT, while admitting that Mr. England's negatives were very good, said the position taken up in the paper was that wet collodion gave greater abruptness in the shading off of the dots. A great *desideratum* was that, whatever the size of the dots, they should be practically opaque over the whole surface. A wet plate would not yield a negative so dense as Mr. England's without intensification.

Mr. J. CADETT wished that the paper had referred to the subject of diffraction. Was it possible, unless the screen was in actual contact with the plate, for the dot to be sharply defined at the edge?

Mr. DOLLOND said their point was that the dots shaded off continually from the centre to the margins, and that the leaving off was imperceptible. The abruptness was produced by after-treatment. No absolute experiments had been made with regard to diffraction, but the experimental results had agreed so closely with the calculated results that he thought there was no appreciable effect.

Mr. T. BOLAS thought that, on more mature consideration, the authors of the paper would find that it was impossible to get a negative in which each dot should have a sharp boundary or distinction between black and white; moreover, it was not desirable to get such a negative. He showed by means of diagrams the difference in dots in negatives produced by exposure on the surface of the sensitive film, and by exposure from the back, as in the Klic process.

Mr. DOLLOND pointed out that it was said in the paper that the necessity for shading depended upon the process by which the block was made.

Mr. E. J. WALL read a summary of an article by Dr. Eder in the current

number of the *Correspondenz*, showing the effect of the use of diaphragms with varying openings. He also pointed out that whereas Messrs. Tallent and Dollond had used *f*-45 in their experiments, Dr. Eder said that about *f*-15 or *f*-18 was the smallest aperture that could possibly be employed.

Mr. BOLAS called attention to Mr. Ives's work of seven or eight years ago, and to his method of increasing and decreasing the aperture during exposure.

Mr. W. GAMBLE had found, as the result of a good deal of investigation, that dry plates would yield exactly the same results as wet plates if they were treated in the same manner, and with the modifications necessary in dealing with the different films. The shape, size, sharpness, or density of the dots was not in any degree different on dry plates to those on wet plates. As to size of stop, in all practical work it would be found that *f*-45 was too small, and that *f*-16 would be nearer the mark. The paper said there was no limit as to the closeness of the screen to the surface of the plate, but he thought this statement required qualification; the distance of the two surfaces should be from one-sixteenth to one-twenty-fourth inch for the production of a good block. He thought diffraction was proved, and suggested that Messrs. Tallent and Dollond should consider the point.

Mr. DEBENHAM suggested the use of a stop having a star-shaped aperture.

Mr. SNOWDEN WARD pointed out that, in considering the size of stop, the coarseness of the grain must be considered.

Mr. CADETT referred to the introduction, by Dr. Albert, of Munich, of a graduated screen, intensely black in the centre and shading off to transparency.

Mr. DOLLOND, in the course of a brief reply, said the paper did not make a strong point of the superiority or otherwise of sharply defined dots. The size of the stop would vary a good deal with the distance of the screen. He and his colleague had not gone into the question of the shape of the stop, but it was not to be supposed that a spot of a particular shape would bring a corresponding shape to the dot.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

APRIL 18,—Mr. T. E. Freshwater, F.R.M.S., in the chair.

Mr. A. HADDON gave a chat about *The Spectroscope*, remarking that it was used in photography for testing dark-room glass and screens for three-colour work. Having dealt with the refraction of light when falling upon a denser medium than air, he described Newton's original experiment in the analysis of light by means of a prism, pointing out that an impure spectrum, caused by the overlapping of the coloured images due to the use of a circular aperture for the transmission of the light, was obtained. Nowadays a slit was used, and the narrower the slit the purer was the spectrum observed. By the aid of the blackboard, dispersion and the angle of deviation were explained, and then Mr. Haddon went on to remark that the spectroscope consisted essentially of three parts: the collimator which parallelised the rays of light, two prisms, and an astronomical telescope with an eyepiece. The prismatic recomposition of light was next dealt with, and the principle of the construction of achromatic photographic lenses was illustrated by reference to the different refractive and dispersive powers of prisms. After referring to the direct prism spectroscope, the construction of which depends upon the employment of five prisms, Mr. Haddon next passed to a brief consideration of the various uses to which the spectroscope had been placed. Chemists had employed it for the discovery of elements which would not have been discovered by ordinary analysis, argon and helium being recent examples.

The work of Bunsen and Kerchoff in the examination of the photosphere and chromosphere having been mentioned, Mr. Haddon said that the spectra of the stars was less complicated than that of the sun. The age of the stars could be ascertained by the spectroscope, a bright line denoting a young star, a dark line an old one. Similarly the spectroscope told us the rate at which stars were approaching us. Thus Sirius, which was once a red star, was now blue. He concluded by mentioning the use of the spectroscope for determining the correct moment when carbide of iron was to be added to the converter in the manufacture of Bessemer steel, the gases being examined as they emerged; the quantitative estimation of gold and alloys, &c.

Mr. Haddon had brought with him a spectroscope, and kindly enabled members to examine the spectra of lithia, thallium, sodium, &c., and subsequently, by means of the lantern, illustrated the use of a bisulphide-of-carbon prism in conjunction with a water prism for obtaining the direct projection of a spectrum.

A hearty vote of thanks was passed to Mr. Haddon for his interesting paper.

PHOTOGRAPHIC CLUB.

APRIL 17,—Mr. J. R. Williams in the chair.

Mr. ISENTHAL asked for information concerning the following difficulty: He developed an Ilford plate and fixed and washed as usual. He then wanted to "clear" the negative, and used Edwards's clearing bath for the purpose. The result was that the negative was so much reduced in density as to be almost useless. He had proceeded in precisely the same manner for some years, and always with success. He had tried an Edwards film with like result.

Mr. HAES questioned very much whether there was not some extraneous matter imported into the clearing bath.

Mr. HOWSON said the matter seemed almost inexplicable, seeing that Mr. Isenthal had apparently answered the several questions asked as to his methods.

MANCHESTER PHOTOGRAPHIC SOCIETY.

APRIL 18,—Mr. Alfred Brothers, F.R.A.S. (Vice-President) in the chair.

Mr. H. Wade was elected a member.

Mr. A. E. Casson exhibited a recent photograph of the moon, which had received a cap-off-and-on exposure with a twelve-inch focus lens, stop *f*-64, but it was "fuzzy."

The CHAIRMAN suggested that there was no necessity for using such a small stop, and that the exposure would have been sufficient and better accomplished by quickly moving an opaque covering in front of the lens or by using a drop shutter.

Mr. W. H. Farrow practically illustrated the making of a camera bellows.

Mr. T. CHILTON called attention to Ackland's focussing scales for hand and copying cameras, as described in THE BRITISH JOURNAL OF PHOTOGRAPHY for 1890, page 132, and exhibited several examples suitable for lenses of various foci.

The greater part of the evening was occupied by the exhibition of lantern slides, the productions of Messrs. Whitefield and J. Wood, who had recently exposed a number of plates on the same subjects, and by request of the Council these were passed through the lantern, not for competition, but for general information. The slides of each worker had distinctive features, and the methods of working were given and numerous questions answered.

Referring to some slides of statuary, which had been very successfully blocked out, Mr. WHITEFIELD said that, when using the usual sixpenny or shilling tablets of Indian ink for the purpose, the surface after a time cracked. This difficulty was now overcome by employing a better quality, sold at from five to ten shillings per tablet by a local firm (Messrs. Grundy & Smith).

The subject of outdoor meetings was discussed and referred to the Council for arrangement.

Ealing Photographic Society.—February 28, in the Society's room, several flashlight exposures were made, Mr. Hal Ludlow having brought some dresses and posed some of the members.

MARCH 7, in the Prince's Hall.—Mr. E. J. Wall gave a short illustration of the various applications of photography, and explained a large number of excellent and most interesting slides. A charge for admission (sixpence) was made on this occasion, and the result (3*l.* 19*s.* 6*d.*) has been handed over to the Photographers' Benevolent Association. If every society were to devote one evening to a similar purpose, we should not have so many heart-rending appeals from that excellent institution, the Photographers' Benevolent Association.

MARCH 21.—Mr. CHARLES WHITING gave an interesting lecture on *Picture-making by Photography*, and his remarks were illustrated by lantern slides.

MARCH 28.—The President and Hon. Secretary gave a demonstration of toning and developing Otto Schölzig's Otto-Presto papers.

APRIL 4.—A series of lantern slides illustrating the growth of ecclesiastical architecture in England, was shown. These views were much appreciated.

APRIL 11.—Mr. A. Ernest Smith gave the members some very useful tips during the course of his lecture on *Negative-faking*.

South London Photographic Society.—The excursion season of this Society opened at Eastertide with an outing to Salisbury, under the direction of Mr. A. E. Allen, the new excursion Secretary, who seems to be endeavouring to outvie his predecessor (Mr. Slater) in energy. The first portion of the party, numbering thirteen, left London on Saturday. On Sunday, the number was increased, and again on Monday until a total of thirty-two was arrived at. Excursions from Salisbury to Stonehenge and West Dean were arranged. Excellent accommodation was found at the Clarendon Hotel, Catherine Street. Every facility for photographing in the cathedral was kindly made by the Dean. The excursionists returned in two parties on Easter Monday and Tuesday.

APRIL 17.—Meeting at 7 p.m., at Hanover Park, Peckham, Mr. B. Lyon in the chair.—Mr. LEON WARNERKE gave a demonstration of *Engraving with Silver Salts* for the production of a block for letterpress printing. The process was divided into two divisions, viz., working the *cliché* and printing. A screen is required, and a minute description of Levy's screens was given by the demonstrator. For some purposes a photographic copy of a screen will answer, but requires careful handling. The screen used by Mr. Warnerke had 133 lines to the inch. Special negatives were required, and for the production of these ordinary dry plates were used and developed with metol. A number of photo-micrographs were passed round, showing the effect of the crossing of the screen lines influenced by the direction of the source of light. A piece of slow chloride emulsion paper was then placed in contact with the negative and exposed to the light of six inches of magnesium ribbon. It was then developed with pyro and ammonia; other developers will not answer. As the image became visible it was at the same time rendered insoluble in warm water. A.—Water, 100 parts; pyrogallic acid, 10 parts; citric acid, 1 part. B.—Water, 100 parts; ammonia lig. ·880, 12 parts; potassium bromide, 4 parts. Mix 10 drops of A, 14 drops of B in 1½ ounces of water. Strict observation of the proportions is necessary, to avoid the total insolubility of the whole film, or too much solubility of the image. The tissue was first immersed in water and the developer then applied in the ordinary way until the image appeared in all its details. The developer as it discoloured was discarded and a fresh solution made up and used. After development the tissue was washed for a short time and was then ready for transfer. A copper plate, cut from good sheet copper free from "devils," was polished with snake stone followed by stick charcoal. The plate and tissues were then placed in contact under water and squeegeed with either a flat or roller squeegee. The plate was then placed in warm water (100° F.), and the paper peeled off. The emulsion not affected by light is slowly dissolved away by warm water as in the carbon process. After draining the plate is placed in equal parts of alcohol and water, followed by a bath of undiluted alcohol—methylated will do. The plate was then thoroughly dried and was then ready for etching after varnishing the back and edges. The etching was performed by solutions of perchloride of iron of different strengths, viz., 45°, 43°, 40°, and 37° Beaumé. The strongest was used first for ten minutes, afterwards the second and third for the same period, and finally the weakest for fifteen minutes. The gelatine is removed from the surface with a solution of caustic potash, and the plate after mounting was ready for printing. A few impressions were made by the demonstrator in an ordinary copying press using stout indiarubber pads. Great pleasure was shown by the members at the President's presence at the meeting for the first time after his long illness.

Aintree and District Society of Photographers and Lanternists (Liverpool).—April 19, Mr. W. B. Hellon (President) in the chair.—The evening was

occupied in listening to an interesting and instructive description and demonstration on *The Method of Making Lantern Slides by Contact;* the lecturer also explained his method of reduction for same. On Saturday last the first excursion took place, the members meeting at James-street Station to proceed to Spital, Cheshire, from whence they walked across country, *viâ* Dibbinsdale, to Raby Mere, where a halt was made for tea at Mill House. Afterwards Bromborough was made for, and then to Liverpool, arriving about 7 p.m., after a thoroughly enjoyable afternoon. During the day about fifty exposures were made. Mr. W. Lockier acted as leader for the day. The following are the newly elected officers of the Society:—*Hon. President:* Mr. J. E. Bennett. —*President:* Mr. W. B. Hellon.—*Vice-President:* Mr. J. R. Jones.—*Council:* Messrs. W. Lockier, W. H. Lloyd, J. Harris, R. M. Owen, G. M. Noakes, and G. Ashley.—*Hon. Librarian:* Mr. G. H. Jackson, 27, Walton Park.—*Hon. Treasurer:* Mr. D. J. Neill, 8, Chelsea-road, Walton.—*Hon. Secretary:* Mr. C. H. Adkins, 28, Orrell-lane, Aintree.

Beverley Photographic and Sketching Society's Exhibition.—On Monday, April 15, Alderman D. F. Burton, J.P., opened the annual Exhibition of the Beverley Photographic and Sketching Society in the Assembly-rooms. There was an extensive and well-selected show of photographs, oil and water colours, prints, landscape and architectural subjects and portraits, and the general attractions included Edison's kinetoscope, concerts, tea room, &c. The show was a decided improvement on that of last year, and was of an extensive character, the exhibits being upwards of 1000 in number. These were tastefully staged in tiers on stands in the large room, and, with the assistance of shrubs, flags, and art muslin, the ensemble was very marked, giving the room a very handsome and unusual appearance. Large entries had been received in the competitive classes from all parts of the kingdom, and, in addition, a considerable number of paintings, photographs, examples of art work, &c., had been sent to the loan section by friends of the Society. The following prizes were awarded:—*Champion Classes*—Prints: W. Thomas (London); Lantern slides (set of six): J. H. Gear (London). Landscape, &c.: 1, W. Thomas; 2, J. H. Gear; 3, S. Aston (Birmingham), and A. H. Bishop (Scotland). Portrait and Figure Studies: 1, J. H. Gear; 2, John N. Croah (Liskeard); 3, S. Aston. Hand-camera Work (six prints in one mount): A. H. Brown (Scotland); 3, C. F. Juston (Liverpool); and H. Palmer (Great Yarmouth). Enlargements: 1, S. H. Fry (London); 2, J. H. Briggs (Lancaster). Lantern Slides (open class): 1, Rev. W. T. Reeder (Scarborough); 2, R. Witty (Hull); 3, G. F. Blower (Ramsgate); and W. Renwick (South Shields). Painting, &c.: 1, Miss B. Payne-Gallway (Thirkleby Hall, Thirsk); 2, Miss E. R. Marshall (Beverley); 3, Miss M. Stephenson (Beverley). *Members' Classes*—Landscape, &c.: A. E. Hobson; 3, T. C. Beaumont, and G. Dawson. Portrait and Figure Studies: 1, G. F. Duck; 2, W. Barnard; 3, A. E. Hobson. Club Excursion Work: 1, C. Goulding; 2, W. Barnard; 3, T. C. Beaumont. Enlargements: 1, R. R. Brown; 2, G. F. Duck; 3, H. Mann and G. Dawson. Lantern Slides: 1, C. Goulding; 2, R. R. Brown; 3, Rev. F. Hall. The Judges were Mr. and Mrs. Francis Clark, of Louth. Mr. J. H. Hudson judged the paintings.

Liverpool Amateur Photographic Association.—The third excursion of the season took place during the Easter holidays, when a number of the members paid a visit to the English Lake District for four days, under the leadership of Mr. F. Anyon. The White Lion, Ambleside, formed the headquarters, from which centre upwards of eighty miles of the district were covered, a special conveyance being engaged each day to convey the party over the most picturesque parts. Lovely weather prevailed, and many charming views were photographed. Upwards of 430 plates were exposed, and the members returned after, perhaps, one of the most successful excursions the Society has yet organized.

Glasgow and West of Scotland Amateur Photographic Association.—April 22, Ordinary Meeting.—Six new members elected. Mr. CHARLES J. KENNAWAY, Principal of the Athenæum School of Art, delivered a lecture on *Light and Shade in Landscape and Figure Composition.* After referring to the varying aspects of Nature under different conditions of lighting, he showed, by means of diagrams, the distributions of light and shade usually adopted in the construction of pictures. A number of copies of pictures by noted painters were then shown on the lantern screen, and the general principles of their construction explained, while various photographs from nature served to show the application of these principles to practical photography.

Kilmarnock and Ayrshire Photographic Society.—April 20.—Mr. J. Mack Wilson, the President, gave a demonstration of Otto Schölzig's Otto paper, and Mr. Ferguson a demonstration of the same maker's Presto paper, both of which were very successful. At the close there was a limelight exhibition of lantern slides.

FORTHCOMING EXHIBITIONS.

1895.		
April 30–May 4	*Eastbourne.	J. J. Hollway, 11, Hyde-gardens, Eastbourne.
May 6-11	*Birmingham.	C. J. Fowler, 2, High-street, Birmingham.
June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Exchange Column.

Adams' Ideal hand camera wanted, exchange safety bicycle.—Address, W. WALKER, Scotholme, Nottingham.

Wanted 10×8 Euryscope lens and camera in exchange for head rest and cash to value. —Address, W. HARMAN, 9, St. Mary's-street, Monmouth.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

SUGGESTIONS IN CONNEXION WITH GELATINO-CHLORIDE PAPERS.

To the EDITOR.

SIR,—In the letter kindly inserted in your issue of the 19th inst. there are two printer's errors which are somewhat misleading.

In speaking of the numerous and various uses of plates, we said, "Matters would be much improved for all concerned were there fewer sizes," &c. (You have printed "four sizes" instead of "fewer sizes.")

Again, in speaking of our intention not to advertise such sizes as 5×4 and 10×8, we go on to say that "in view of the vast number of hand cameras quarter-plate size, we feel there should be a large demand for a paper cut 4×3" (you have printed 4×5), "and so propose including this in our list."

We hope you will be able to correct these errors, which we feel will cause some to misunderstand our meaning. Apologising for thus troubling you,—We are, yours, &c., WELLINGTON & WARD.

Elstree, Herts, April 20, 1895.

UNINTENTIONAL PLAGIARISM.

To the EDITOR.

SIR,—In reply to Mr. Hodges, I readily accept his bare denial of any attempt at plagiarism, without going into the proofs he offers; but this does not mean that I withdraw my reference to his work being so strikingly like my own, and in support of this I now quote for comparison as follows:—

J. A. HODGES.

"My chief reason for recommending 3¼×3¼ plates in preference to the more familiar 4½×3½, lies in the fact that the former can be enlarged up to the corners in any optical lantern fitted with the standard four-inch condenser, whereas quarter-plates would require a five-and-a-half-inch condenser—or, in other words, a more costly enlarging apparatus. Moreover, lantern slides can be made by contact—the easiest and most expeditious mode of producing them—and the whole of the subject preserved, whilst with quarter-plates the slide must either be made by reduction or a portion of the subject sacrificed. To lecturers, travellers, or those who use photography as a 'recorder,' or to amateurs generally who wish to extract as much amusement from their hobby with as small an expenditure as possible, this system of working specially commends itself. With 3¼×3¼ plates the work of enlarging can be done in the ordinary optical lantern with a four-inch condenser, but better results as regards definition will be obtained if, in lieu of the ordinary lantern objective, which is seldom very perfectly corrected, a rapid rectilinear is substituted."

"On such occasions my camera, like a faithful dog, is my constant companion, and, rain or shine, it accompanies me whenever I venture abroad, for experience has taught me that in photography, as in most things mundane, the unexpected always happens, and the best pictures present themselves when the camera has been left at home."

M. J. HARDING.

"I concluded that, for many reasons, three and a quarter inches square would be the most convenient size to adopt. For the making of lantern slides by contact it is obvious that my small size is the best, because with any increased area—even quarter-plate—part of our subject must be sacrificed, or the more complicated method of reduction resorted to. In the making of enlargements no large and costly condensers are required. To that great majority of amateurs whose only spare time is 'after the day's work is done' I commend this most simple and economical plan . . . . of bringing the ordinary optical lantern into use. The finest definition will be gained by fitting our rapid rectilinear lens to the lantern."

"The magazine camera is often left at home unless photography is the special object in view. . . . . Still, we never know when trumps may turn up. . . . . My pocket camera has become my almost inseparable companion . . . . and had the unexpected happened it would have been duly recorded."

It is not only these examples, but rather the gist and tenor of his article as a whole that convinces me, after reading and re-reading, that it is no accidental resemblance to my own writing, and I am certain that "any unbiassed person" reading both our productions could but conclude that either I had copied Mr. Hodges or he me! The question is, How can this view be reconciled with my acceptance of his denial? Luckily there is a way out of it, for my "Snap-shot Photography" originally appeared in 1892 as a series of papers in the *Hand-Camera and Lantern Review*, and I have not the slightest doubt that it was here the inspira-

tion seized Mr. Hodge, my ideas impressing him so strongly that he has, all unconsciously and "without intent aforethought," reproduced me pretty closely, often improving upon my own unpolished style.—I am, yours, &c., MARTIN J. HARDING.

Havelock-road, Shrewsbury, April 22, 1895.

A HARD CASE.

To the EDITOR.

SIR,—*Re* "Printer's" letter, "A Hard Case," published in your issue of March 20, I was in the employ of a firm doing the cheapest style of work, and the treatment I and other assistants received in the employ of this firm corresponded with that of "Printer." "Printer's" is indeed a hard case; but not by any means is it the only one. Should there be a slight depression of trade, the assistants are asked by the head of this firm to give "a satisfactory reason why business is bad;" if they cannot "account for it," they are threatened with dismissal. This firm is open on Good Friday and all Bank holidays. Work is commenced at 10 a.m. on Bank holidays, at 5 p.m. the studio is closed. The operator has, after taking from fifty to sixty sitters, to stop and develop and get the "negs." ready for retouching, the developing occupying till 8 or 9 p.m., and in some instances till 10 p.m. Should the developing not be done, he is bullied in the morning, the same occurring on Fridays, when the firm prides itself on closing at 5 p.m. This, sir, is making slaves of the assistants. No other day is given for Bank-holiday work, and no holidays are given by the firm; if taken, they are stopped for, and same in case of sickness. I quite agree with "Assistant" it will be a good day for assistants when a union is started, and this system of tyranny and sweating is brought to a close.

Thanking you for giving publicity to the matter,—I am, yours, &c.,

London. AN OPERATOR.

A LUCRATIVE APPOINTMENT.

To the EDITOR.

SIR,—In your last impression there was an advertisement as follows: "Wanted, a good operator who can print and tone well; also retouch, wages 12*s.* per week, with board and lodging—must not object to do a little operating on Sundays; send specimens of own work; *carte* of self and reference," &c. Judging by the remarks of several emloyers of photographic labour, I feel sure it would be very interesting to many of your readers to know how many competent assistants applied for this lucrative London appointment.—I am, yours, &c., DROP SHUTTER.

April 22, 1895.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

BUTCHER & SON.—Next week.

RECEIVED.—Adams's *Photographic Annual.*

ARTIST.—Both books may be obtained from Marion & Co.

DABBLER.—Pending inquiries which are being made, see the table on page 943 in last ALMANAC.

J. C.—Opinions differ. In the mean time you will be quite safe in employing the rapid rectilinear by any of the makers named.

BATHONIAN.—The alkaline citrates restrain development in the case of over-exposure, and should not be used in the case of under-exposure. Bromides retard development whether the negative be under or over-exposed.

CARBON.—The *Autotype Notes* is not published for sale, but is issued by the Autotype Company, as a private communication, to their customers. The Company will probably let you have a copy monthly by writing for it.

S. S.—Please make your query more explicit. Gelatine prints cannot be mounted by the application of a wet sponge, therefore there is no "principle" to be explained. Better write definitely what you wish to know.

C. BURNELL.—Do not be deterred from entering the field of mechanical photography, that is, if you are prepared to work yourself up to real proficiency in the branch you take up, not without. It is the inefficiency of so many workers that is causing so much of this class of work to be sent abroad.

C. A. C.—You may copy the Rubens picture if the owner sanctions it, and make your reproduction copyright. But that will not, of course, prevent any other photographer doing the same if the owner of the painting permits him to copy it. You cannot copyright Rubens' work though you may your own.

R. DE SALIO.—We know nothing more than was reported of the lecture or the particular method used in the bleaching. We suppose, however, it is simply the one that has so often been described in this JOURNAL—immersing the picture in a solution of bichloride of mercury. The strength of the solution for restoring the image is immaterial.

B. W. C.—If there is a written agreement, duly stamped, for a three years' engagement, bad trade will be no valid excuse for breaking it. If the *employé* is discharged before the end of the term, he certainly will have good grounds for legal proceedings and the recovery of damages, and a falling off of business will be no bar to them.

R. H. R.—Collodio-bromide plates for negatives should never be used without backing them, more especially when taking the interior of a church, where the contrasts are necessarily great. We are not in the least surprised that the end window is lost in halation. Backing is more necessary in the case of collodio-bromide plates than it is with gelatino-bromide ones.

R. SIMCOX.—The fading may be caused by the mounts, or the mounts may have nothing whatever to do with it. Gelatine prints, like other silver prints that are not carefully made, are liable to fade, whether they are toned in the combined bath or not. It would be libellous to say that mounts are the cause of the fading on no other grounds than that the prints have faded within a few months.

J. A. M.—Make four feet six or five feet top and sides, at each end of the studio, opaque; all the rest may be of glass. The sitter, for general work, may be placed at the south end of the studio, and for occasional subjects at the opposite end. The size of the studio might well be increased, as the dimensions given are for a very small one—that is, if professional work has to be done in it.

H. HARRIS.—Amyl-acetate, or acetate of amyl, is not likely to be kept by a village druggist—or a town one for that matter—except, perhaps, in a diluted form, under the name of "Essence of jourganelle pear," for flavourings. It will have to be procured from such houses as Hopkin & Williams, Mawson & Swan, and others, if required in quantities of only a few pounds at a time. Fusel oil may he had from similar sources as the amyl-acetate is obtained.

W. WIDNELL.—We cannot answer the question. It should be referred to the makers of the new lenses as to why they are charged at so high a price. It is not within our province to go into the question of "the small difference in the cost of the glass, the labour being the same," &c. Monopoly or not, manufacturers have a perfect right to charge what price they like for the goods they supply; therefore what would be the use of airing your supposed grievance?

OPERATOR (Dorset).—The studio shown in the sketch is an awkward one to work, but there are many worse ones, particularly when it is considered that the light that enters it is from the most constant quarter, the north. The only way to ameliorate the deep shadows caused by the top light is by the judicious use of reflectors. As you say you can sometimes obtain good results, study well the conditions of light under which they are obtained, and repeat them in general working as nearly as possible.

OPALINES writes:—"1. I wish to mount some gelatino-chloride prints on glass as opalines; will you kindly tell me whether any special treatment is necessary, or if simply squeegeeing to the glass will be sufficient to cause it to adhere? 2. Will you also tell me the best medium for sticking on backs to same?"—1. Some gelatine papers, if they have not been treated with alum, can be mounted by simply squeegeeing them, while they are still wet, on to the glass, but some cannot. 2. Common glue is generally used for sticking on the backs.

J. LAWSON writes: "Some time ago I purchased some negatives at an old rag shop. I found a few of them were very nice portrait subjects, and, after being retouched, &c., made pretty good prints. Now, shall I be doing wrong in printing from them to show as examples by my particular printing process? I have tried to find the person who photographed them, but the man I bought them from says that he found they came to him in such an indirect way that he could not find him, though he tried."—This is a question we cannot answer beyond saying that the persons depicted can restrain their portraits being exhibited, and possibly recover damages for injury, if any, sustained. Of course, if the subjects are the copyright of any one, penalties as well as damages can be recovered.

CONTENTS.

	Page
EXPERIMENTS WITH FORMALIN: WASHING NEGATIVES WITH BOILING WATER	257
THE DECOMPOSITION OF SODIUM THIOSULPHATE	258
JOTTINGS. By COSMOS	260
THE SIZES OF PLATES AND PAPER. By W. B. BOLTON	26
THE AMOUNT OF SILVER IN ALBUMEN PAPER PRINTS. By HERBERT S. STARNES	262
THE CAUSE OF "DEVILS" OR PITS IN PHOTO-ENGRAVED COPPER PLATES. By E. SANGER SHEPHERD	263
PHOTO-CHEMICAL NOTES. By G. E. BROWN, A.I.C.	264
THE EXAMINATION OF PHOTOGRAPHIC LENSES. By J. R. GOTZ	264
PLATINUM TONING: MR. J. KIDSON TAYLOR'S METHOD	268
OUR EDITORIAL TABLE	268
NEWS AND NOTES	268
RECENT PATENTS	269
MEETINGS OF SOCIETIES	269
FORTHCOMING EXHIBITIONS	271
EXCHANGE COLUMN	271
CORRESPONDENCE	271
ANSWERS TO CORRESPONDENTS	272

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1826. Vol. XLII.—MAY 3, 1895.

A NEW STEREOSCOPIC ATTACHMENT TO THE CAMERA.

As if simplicity and perfection in the construction of a stereoscopic camera had not long since attained their acme in taking the twin negatives simultaneously by means of a binocular camera, we find that another possessing only one lens is now placed on the market.

Whereas, by means of the septum or division that separates one side of the interior of the binocular camera from the other—this, in reality, forming two independent cameras placed side by side, taking a pair of pictures, alike in every respect, as seen by each eye—the new one, we understand, does not contain any such division.

It is not, when being used, pointed in the direction of the view to be taken, but to a pair of mirrors placed in regard to each other at a slight angle, the images reflected from these being made to pass through the one objective attached centrally to the camera, and made to take their places alongside of each other, the two reflections being so carefully adjusted that each shall come up to the vertical centre of the plate, and no farther.

There must of necessity be some drawbacks to the employment of such an instrument as we have here described. That which will be first noticeable will be the unpleasant one that, if the negative be taken on a glass plate, or even on a film of any desirable degree of rigidity, and it be printed upon silvered paper, as usual, everything will be inverted from right to left. In one way only does it seem to us possible to obtain from such negatives prints non-inverted laterally, and that is by the single-transfer carbon process, which, as every carbon printer knows, gives a print that is in a position reversed from that in nature, a condition of things that is cured by transferring yet again, known as the double-transfer process.

By impressing the sensitive surface *through* the glass or celluloid, that is, placing the back of the plate next to the lens, then will a negative be obtained that is fit for being printed in the usual manner. There is nothing difficult about this, but it involves minor troubles which the average photographer will probably not care to face.

There is still another way by which this reversion, or, more correctly, this lateral displacement of the details of the image may be obviated, and that is to take the negative on a spool of thin Eastman film and print through the film, which being so thin will, from this very thinness, cause no serious diminution of sharpness of the print, although it should never cease being borne in mind that, of all photographic prints, stereoscopic ones should ever be the sharpest, seeing that they must be viewed through eyepieces of from five to eight inches focus.

We are inclined to make light of an objection we have heard urged against the employment of a pair of mirrors, which the maker designates the transmitter, in regard to there being two reflecting surfaces, one being the plain glass and the other the silvered surface at the back. We and many others have proved times innumerable that, unless the surface stands at a very oblique angle to the axis of the lens, the primary reflection from the silvered surface is so bright by contrast with that from the plain surface that the latter is practically annihilated.

One point more is worthy of attention. It is claimed as a feature in the new transmitter that, in virtue of the disposition of the right and left images on the negative, the necessity for cutting the prints asunder when mounting them will be done away with. This is a somewhat strange virtue to make claim for in a country wherein scissors and trimming knives abound. Every person of taste has always considered that in the proper trimming and mounting of the prints, so as to allow the mount to surround each, lay a very great charm. Forbid that the cheap and nasty style that characterised so many of the low-class prints before the stereoscopic renaissance, in which the right and left pictures ran into each other, should again be introduced! We can, however, conceive of the possibility of there being such a rush for prints from one or more particular negative as to render it advisable to trim the negatives in such a manner that by the one single act of printing all necessity for cutting and trimming the prints will ever afterwards be avoided. In the leading article in the Almanac for 1887 a chapter was devoted to showing in what manner some large American producers of stereographs got over all difficulty and delay of time in printing these pictures so as to have them in readiness for pasting on the mounts as soon as the fixing and washing had been completed, and for all requisite details we refer the readers interested in this branch of photography to this publication. It is by far the easiest and best of processes that has yet been published, but space prevents us from reproducing the full description here; suffice it to say that it consisted in cutting the negative, so that when the two halves were transposed and attached to another plate of glass, as directed, every print thereafter produced was correct and needed no further trimming.

We write this without having tried or even seen this, the latest invention of Mr. Theodore Brown of Salisbury, whom we

compliment upon the ingenuity of his invention. We remember an equally excellent application of the Latimer-Clark principle of shifting a small single camera for taking stereo pictures which he introduced over a year ago, and which is destined to be very useful for this purpose. It is, indeed, one of those simple applications which, were we going on a tour with a small single-lens camera, we should never think, now that it has been tried, of leaving behind us, and which, on account of its inherent merits and the small space it occupies, can be kept attached to the camera stand, always in readiness for duplicating a subject in true stereoscopic projection. It is entirely free from any of the drawbacks which we have hinted as possibly applying to his more recent invention.

THE FIXING BATH FOR POSITIVE PRINTS.

Following on the remarks we made last week on the subject of MM. Seyewetz and Chicandard's researches in connexion with the decomposition of sodium thiosulphate, it may not be out of place to consider one or two points where those researches bear upon the practical use of the hypo fixing bath, more especially as it applies to prints.

We referred in the course of our remarks last week to the acid fixing bath as chiefly employed for negative purposes, and pointed out that, whatever changes may go on in the solution itself, they probably have very little influence upon the stability of the negative image provided, of course, that the bath is prepared and used according to the usually accepted directions. Whether the conditions are quite similar in the case of the more delicate image of a positive print, either on albumen or gelatine, is a question that scarcely requires much argument, yet we frequently hear of the acid fixing bath being used for gelatino-chloride prints, while the almost equally dangerous combined toning and fixing bath is in constant use.

Since the elaborate researches of MM. Davanne and Girard, thirty years ago, which practically gave the death-blow to "sulphur" toning and combined toning and fixing baths for albumen or plain paper, we have had no such careful consideration of the chemical changes that takes place in the use of our old "enemy," hypo, as that contained in the paper to which we have referred; and it almost seems as if in recent years there has been a tendency either to revert to old methods or even to start fresh with the primitive practice of forty years ago. Failing chemical justification for the use of the acid fixing bath and the "combined" toning solution, there is certainly no other explanation, unless it be that by their use a certain immediate result is more easily obtained than by other methods, without any regard to the future.

So far as hypo is concerned as a fixing agent, it is only since the introduction of gelatine plates that it could be considered as a generally employed agent for negative purposes, cyanide of potassium having been almost universally employed for wet-collodion plates, being a far more rapid solvent of iodide of silver, the chief constituent of such films, as well as more easily removed from the film after it had done its duty. In the case of dry-collodion plates and especially collodion emulsion—in which silver bromide predominated over iodide if not used alone—hypo proved not only the quicker but also the safer fixing agent; but, even for dry plates, cyanide was frequently employed, so that we may say in the past the use of hypo was practically confined to positive work.

Going back to the practice of two decades ago, do we find anything in the shape of acid fixing baths? So far as our recollection goes, most certainly not, but rather a general tendency to observe every precaution that would prevent an acid reaction either in the hypo solution or in the salt itself before solution. Every writer on the subject, every teacher of photography, laid it down as a prime law that the fixing solution for prints *must* be freshly made each day and never used a second time, owing to the rapid decomposition of the hypo in solution.

Later on, some five-and-twenty years ago, the alkaline fixing bath was proposed—if we remember rightly, by Mr. John Spiller—more particularly for the purpose of securing purer whites than the ordinary bath gave, but indirectly, because, in the alkaline condition, the solution of hypo, though perhaps no less prone to decomposition, is less liable to form dangerous or immediately deleterious compounds. In fact, as has been shown in these columns only a few weeks back, the fixing bath when used in an alkaline condition is robbed of much of the dangerous character that usually attaches to it, and more especially so when its use is considered in conjunction with prints.

In the acid state, as shown by MM. Seyewetz and Chicandard, not only is there a most complex series of decompositions set up at the outset, but it is almost impossible to determine when they are finished; and, though the use of a slowly decomposing solution upon the comparatively robust image contained in a gelatine negative film may not leave any serious effect behind it when ordinary precautions are observed, it is scarcely safe to say the same of the more delicate printed-out image upon either gelatine or albumen paper. When, however, the hypo solution is in an alkaline condition, the circumstances are very materially changed. It cannot be said, perhaps, that decomposition is prevented, for that, in the case of a substance like hypo, is impossible, but the products of decomposition are rendered harmless; not merely *comparatively* harmless, but absolutely so, so long as the condition of alkalinity is maintained.

The use of an alkaline fixing bath would, therefore, perhaps seem a simple way out of all difficulties, were it not that its possibilities are limited by the fact that neither albumen nor gelatine paper can be safely worked under anything but faintly alkaline conditions. It was the solvent action of the alkali on the albumen surface that retarded the general adoption of the alkaline bath in days gone by, and it is the softening effect upon the gelatine emulsion that chiefly prevents its use at the present time. Yet there were many operators in past years, and there are some still, who regularly employ the alkaline bath, and would as soon think of acidifying the gold toning bath as the hypo.

This brings us to the consideration of one or two points in Mr. J. Kidson Taylor's method of fixing and finishing prints given in our last issue. The first to be noted is that the fixing bath is rendered alkaline by the addition of one drachm of strong ammonia to the quart of solution. This goes far to explain the possibility or the practicability of his next proposal, namely, the repeated use of the same bath—a practice, as he himself acknowledges, usually deemed heterodox in the extreme. There is really no reason why, provided the solution is not in a state of decomposition — that is, giving off sulphuretted hydrogen and other sulphur compounds—the fixing bath for prints should not be repeatedly used, as is the custom with the same bath for negatives. It has been usual from time immemorial

o impress upon the beginner in photography the importance of using a perfectly fresh solution of hypo for every new batch of prints toned, and it is very good advice if a plain or an acid solution be used; but, if the hypo be rendered alkaline before use and kept *slightly* alkaline after use, there is no reason, either practical or theoretical, why it should not be repeatedly used so long as its energy remains. The positive fixing bath in this respect has one distinct advantage over the negative, that it does not become discoloured by use; if it should, it is certain either that the condition of alkalinity has not been maintained, or that something else is wrong somewhere.

But, in adopting the practice of repeatedly using the same fixing solution, we would strenuously warn our readers against falling into the error of imperfect fixation. As Mr. Kidson Taylor remarks, the permanence of prints (and of negatives also) depends at least as much upon perfect fixation as upon perfect washing. In making repeated use of the same bath, it will be well not to carry the principle too far, and, as it is scarcely possible in a convenient manner to even approximately estimate the remaining power of a partially spent bath, it will be wise not to use it more than two or three times at the outside.

The advantage to be gained by this "innovation" is not merely the saving of a small quantity of hypo—which is cheap enough—but, as Mr. Taylor points out, with a used bath there is less loss of the finer detail of the print, and also less pulling down generally, especially in the case of prints from very soft negatives. There is also less alteration of tone in the fixing bath.

It might be considered that the used bath, from its action in preserving the finer gradations of the print and its less reducing action, behaved to some extent as a toning agent after the manner of the old sulphur toning bath, consisting of hypo with the addition of a silver salt. Such, however, does not appear to be the case, for, though with an old bath we have little or no reddening of the tone during fixing, we have certainly never been able to detect any sign of the toning action having been continued.

Another point in Mr. Taylor's paper that we may notice, although it is not immediately connected with the subject in hand, is the use of chrome alum instead of ordinary alum for finally hardening the surface of gelatine prints. It is surprising that this practice has not been more generally adopted, for, while a much weaker solution of chrome alum would produce an equally good result, the danger of any inconvenient reactions with any hyposulphite remaining in the print would be greatly reduced. Before using any fresh sample of chrome alum for this purpose, however, we should recommend the application of Professor W. K. Burton's method of purification, namely, to powder the salt and treat it with methylated spirit, by which means any free acid present will be removed. After this it may be used with safety.

CHLORIDE OF GOLD AND THE ACETATE TONING BATH.

A CORRESPONDENT, writing over the signature of "Toning," puts a query which, as it is a type of a frequently recurring kind, we have deemed suitable for writing upon at some length.

The acetate toning bath is really the simplest to make, most certain in action, and most permanent as regards its keeping in proper order of any; yet, at the same time, there can be no doubt that it is liable to irregularity if improperly made or treated after being made.

We will take, *seriatim*, the various points involved, the first naturally, being the gold chloride. We are glad to find that the advertisements of cheap chloride no longer appear in such profusion as they did some time ago. For many years previously it was a well-understood arrangement that chloride of gold, or rather the double salts of gold and an alkali, contained one-half its weight of pure metal; but the chloride as advertised at low prices could not possibly contain that amount, the price charged being insufficient to pay for that proportion of metal alone, even when the cost of manufacture and waste was disregarded. It will thus be very readily seen how it must happen that toning baths would necessarily vary in their power and their action, if sometimes genuine, and at others adulterated, chloride were made use of. That our readers may form their own conclusions on this matter, we may say that, if a fifteen-grain tube of chloride contains half the quantity of metal we indicate, that metal is worth almost exactly one shilling and fourpence. What is a fair selling price, reckoning interest of money, cost of material, time, and possible waste, must be close upon twenty to twenty-five per cent. extra. It follows from this that home-made chloride must be a great economy; and it is very easy to make, as we have explained repeatedly. We know many large users who simply dissolve new gold coins in aqua regia (a sovereign contains a pound's worth of gold), and entirely disregard the contained copper, averring that it is absolutely indifferent. We are aware that others hold different views, so we give the experience for what it is worth.

It is, as our readers know, a common custom to keep the chloride in solution of a grain to the drachm strength. Before using this it is absolutely essential, if true value is to be obtained from this particular bath, that it should be neutralised before adding the acetate. This is the rock upon which so many toning baths are wrecked. The gold solution is measured, the acetate added, and, presto! it is expected a perfect bath will be the result. This, too, though every sample may vary in the extent of its acidity. It may be said, Why should not chloride of gold be sent out neutral? The reply is simple: The pure salt is naturally acid, the neutral chloride being an entirely different chemical compound, and further, which is not stable; it would gradually decompose upon being kept. For making the toning bath, however, it should just before being compounded be made almost neutral, and this is most readily done by adding to it in its concentrated form a pinch or two of common chalk or whiting, and shaking it up at intervals for a few minutes. It will be observed that the strong yellow colour will give place to pale brown, at which stage it is ready for mixing with the acetate. Common consent fixes the proportion of this salt at about thirty grains to one of chloride. A bath so made requires two or three days to ripen, the stage when this is brought about being seen by the original yellow tint of the liquid disappearing, and the bath becoming either colourless or pale sea-green; it is then ready for use. Our own opinion as to the strength for mixing is that it is far better to make a stock bath containing a grain of chloride to the ounce, and to dilute this as required. This, however, is a disputed question, and ultimately the toning results do not practically differ.

At this stage we may say that our experience upon one matter of practice differs entirely from that of the majority. We allude to the common method of procedure when the bath

requires strengthening. What is almost always recommended is to add a few grains of chloride of gold when the bath begins to work too slowly. We say very emphatically that this is wrong in principle, and equally decidedly do we say that practice shows the validity of our objection. The moment we add fresh chloride we alter the proportions of acetate to gold, and at once introduce want of regularity or constancy of composition. What ought to be done is to add, not raw chloride solution, but concentrated toning bath, say, of the strength suggested above—one grain to the ounce. By adopting this plan our solution is constant in composition, and, provided it is properly treated and kept, there is no need ever to make up an entirely fresh bath.

We will conclude by directing attention to a common source of danger to the integrity of this or any toning solution. The utmost care must be taken that not a trace of hypo solution be allowed to contaminate the gold bath. This, under the sloppy and unsystematic mode of working so many are guilty of, is a matter of such probable occurrence that it will account for a very large percentage of recorded failures. If one drop only of fixing solution were dropped into a quart of gold bath, its toning action would practically be entirely destroyed. Fortunately, if such a proportion as this gained entry, its presence to a skilled observer would at once be made manifest by a change in colour. The toning solution would become a pale, sickly yellow or pale brown. Our last words on the subject, therefore, are, that a toning bath made as we recommend will remain in constant working order so long as it remains either colourless or only pale green, blue, or purple; the moment it shows any other colour, it should be rejected incontinently.

The Great Auk.—The sale of a specimen of this extinct bird by Mr. Stevens has created considerable interest in the ornithological world. Although the bird was bought in at the auction sale, it has since been sold to the Edinburgh Museum for the respectable sum of three hundred and fifty pounds. Of course so rare a specimen as this would not pass through the hands of such an enthusiastic photographer as Mr. Stevens without his securing a fine photograph of it, and this he has done. Whether he will publish it or not we cannot, of course, say.

Wood Blocks.—Comments have not been few of late on the low prices that the wood blocks engraved by that celebrated engraver, T. Bewick, realised when they were recently disposed of by auction. Were the low prices to be accounted for, we were recently asked, by the taste of the public having changed from engraved blocks to photo-process blocks? We think not, at least to a sufficient extent to cause the depreciation in value, and we very much question whether a similar number of the very best process blocks now in existence would fetch anything like the prices made of the Bewick ones, small as they were, when they are of similar age, even if they were in perfect condition.

Picture Exhibitions.—Lovers of pictures have every opportunity just now of gratifying their tastes, for there are now open, and will be for the next two or three months, more fine-art Exhibitions than at any other period of the year, and the doors of the Royal Academy will be open next week to add to the number. The majority of the shows are of works of the past year, very many of which are exhibited with a view to their meeting with a sale. From what we are told, on pretty good authority, picture dealers and publishers are by no means disposed to pay high prices for paintings just now, even for the work of our leading men, and artists generally have, for the past year or two, had great difficulty in obtaining good prices for their work, if they can dispose of it at all. The picture trade is evidently decidedly flat at the present time, and many painters are painfully aware of it.

The Sand Blast in Photographic Technics.—We have occasionally described the various uses to which the process originally termed "Tilghmann's Sand Blast" has been put for photographic purposes, and, in a lecture recently delivered at the Society of Arts by Mr. J. J. Holtzapffel, a marvellous array of uses was explained. Not to speak of granite, marble, slate, iron, &c., being acted upon by so soft a material as sand, we may transcribe a part of the list of its uses more specially interesting to our readers. Glass, as we know, is almost immediately deprived of its glossy surface, and we thus get "ground glass" for focussing screens and matt-surface opal for carbon or other photographic images. It frosts the bulbs of our incandescent electric lights, and is used for marking the graduations on measuring glasses. It pierces apertures in glass, gives a surface to celluloid films, and latterly has been used for blocks for printing. There seems to be an endless and increasing use for this most singular process.

A Big Blast.—On Saturday last one of the largest, if not the largest, blasting operations ever attempted in this country was successfully carried out. At Lord Penrhyn's quarries at Bethesda, Carnarvonshire, a little impediment in the shape of a rock had stood in the way of working for many years past, but last Saturday it ceased to exist. To remove a mass of rock estimated at 125,000 tons some power is required, and this was successfully supplied by seven tons of gunpowder. The event at Bethesda was made a gala day. Of course, such an event as this would not be complete without a photographic record of it, and that, we are informed, was made on a scale in accord with the extensiveness of the undertaking. Some dozen or more cameras, 12×10 and larger, were placed at different points, some as near as they could with safety be placed, and others at longer distances—half a mile or more. The exposures were, with all, made simultaneously by electricity. A current released the shutters and made the exposures at one and the same moment. We have not heard the result; but, if it was not successful, we are sure it was not the fault of those to whom the work was intrusted.

The Living Picture Case Decision.—Judgment has been delivered in this now well-known case, in which the Empire Theatre Company were the defendants. It was decided some months ago that the pictures, so far as the living figures and the solid accessories were concerned, were not, by law, infringements of the copyright of the plaintiff, Herr Hanfstaengl, but there might be an infringement of it in the painted backgrounds. That question was settled on Thursday last week. The learned Judge, Mr. Justice Stirling, in giving judgment, said that on the evidence he came to the conclusion that the backgrounds had to some extent been copied from the pictures, but in only three cases were they substantial or material copies. He decided that there had been an infringement in these instances, but, as he did not think the plaintiff had made out his title in one case, he was only entitled to relief in the other two. He awarded him forty shillings by way of damages and ten shillings by way of penalties per night for each of the two pictures when they were exhibited, and forfeiture of these backgrounds to the plaintiff, and also granted an injunction, but made no order as to costs. Execution, except as regards the injunction, was suspended for a month, in view of an appeal, so possibly we have not yet heard the last of the living picture case, or rather cases. Be that as it may, the decision here given, coupled with those we commented upon a few weeks ago, will certainly not strengthen the position of holders of copyright, whether it be in photographs or paintings.

A New Mode of Preparing Wood.—The usual mode of fitting wood for being used for such work as camera-building, and the like, is to desiccate it by time and exposure to air, and, when

stocks of well-seasoned mahogany, many years old, have come on to the market, they have fetched prices greatly in excess of the newly cut raw material, nothing being considered equal to time in maturing the quality of wood; but, when exposed to moisture, this maturing only defers the evil effect such exposure is bound to bring about. According to Mr. Haskin all such methods of preparing wood are wrong in theory and practice, and he has devised a mode of treatment which is known as "Haskinising," or "vulcanising." He contends that it is wrong to remove the sap, and he so treats the wood as to retain and solidify this life-preserving substance in the pores. He takes the wood if necessary in its green state, and the various compounds in the sap are by great heat and air pressure distilled and retained within the wood, without losing their preservative and antiseptic properties. The albuminous, glutinous, resinous, and oleaginous compounds become coagulated in the pores of the wood, and impregnate its whole substance. The soluble sap thus becomes insoluble, filling up the pores, binding the fibres, and together forming one homogeneous mass, impervious to atmospheric changes, unshrinkable, easily worked, and practically indestructible. It is stated that, for cabinet work and general mechanical purposes, vulcanised timber is unsurpassable, and that, for special work in hard wood, any natural shade of colour can be produced at will. If all this glowing account prove any where near the truth, it is evident that in Haskinised wood we have the very material for which camera-makers have for years been longing. They, or any one interested, can readily have means for forming a judgment, as a large number of specimens are now on view, to be seen at 2, Dean's-yard, Westminster.

Spectroscope Slits.—Any one familiar with the use of the spectroscope, even those of "pocket" form, is familiar with the difficulties besetting the keeping in proper order the knife edges employed to produce the slit—how easily they may become rusted, how an obstinate particle of dust may cause the band of colours to be traversed by a "black thread," and so on. With instruments of greater precision, such as are used for photo-spectroscopic purposes, these difficulties of preserving the integrity of the sharp edges of the jaws are increased many fold. Mr. Crookes, however, who may almost be termed the arch-spectroscopist, has invented a most beautiful and ingenious method of getting rid of the difficulties, and, in a recent number of the *Chemical News*, describes his new mode, and the special conditions that had to be fulfilled. The edges of the slits must be made of a very hard material, capable of being ground to a knife edge. It must not be granular, or it cannot be worked sufficiently exactly; must not be brittle, or the occasional necessary cleaning might injure it; should be capable of withstanding any acid vapours, and, finally, must not permit light to pass except through separation of the jaws. He tried iridium, pure wrought metallic cobalt, and manganese steel, each being hard and capable of taking a fine edge; but there was uncertainty about possible corrosion. Finally, he hit upon his present most ingenious plan. The new jaw slits are made of clear transparent quartz, ground to an angle of ninety degrees. The main part of the grinding of the slab of quartz (four millimetres thick) is at an angle of forty-five, and a subsidiary small slice is ground from the under side at a similar angle, making the actual edge angle one of ninety degrees. The under flat face is covered with an opaqne substance, and so permits no light to pass, while the light received on the sloping side of the jaw is entirely deviated out of any injurious path by refraction. We may conclude our description by Mr. Crookes' own words with regard to the powers of the new slit. He writes: "With the pair of jaws of the spectroscope now in use I can take excellent photographs when they are only ·0001 of an inch apart." The refinement of photo-spectroscopic work now possible will thus be greatly increased.

THE COMPARATIVE DEVELOPING VALUES OF THE ALKALIES.

In his interesting column of "Jottings" in last week's issue, "Cosmos" has given a table of the comparative equivalents of the different alkalies in general use for developing purposes, which induces me to offer a few words in explanation of some points that might otherwise prove somewhat misleading. The recent references in these pages to the alkalies in common use, but more especially ammonium carbonate, will help to make clear the value of such a table if complete, which is scarcely the case of that of M. Albert Londe as given.

In the first place, there are one or two errors in the figures that are so palpably slips either of the pen or the printer, that there is no necessity to do more than I have done in putting them right in the extended table I give below. But a very serious point indeed, as being distinctly misleading, is found in the fact that the figures under the head of carbonate of soda refer to the *anhydrous* salt and not to the crystals as generally—nay, it may be said universally—employed I venture to hazard the remark that probably not one in a thousand of the users of carbonate of soda for developing purposes dreams of using the anhydrous salt, and if it were used probably not once in another thousand cases would it be really free from water, in other words, what it was supposed to be; whereas the crystals constitute a stable and definite article.

How great the difference is between the values of the two and the importance of the correction, will be seen from a reference to my table, in which I have added the figures for the hydrated crystals as well as for the ordinary carbonate of potash and carbonate of ammonia. Here it will be seen that the combining value of the anhydrous salt is nearly two and three-quarter times as great as that of the decahydrated crystals in common use, a difference wide enough to give rise to serious trouble in actual use.

I may also call attention to the column headed "ammonia," in order to point out that these figures do not refer to "liquor ammonia" or the strong ammonia in common use, as might be supposed by some, but are based upon the values of NH_3, or the ammoniacal vapour of which liquid ammonia is a solution. In the strongest liquid ammonia obtainable the percentage of real alkali is a little over thirty-five per cent., according to the table of Carius given at the end of the ALMANAC, so that here, again, a difference of three to one nearly might occur in the calculations if the actual state of affairs be not borne in mind.

In the accompanying table, I have extended the figures so as to include both the anhydrous and the hydrated carbonates of soda and potash as well as the sesquicarbonate of ammonia, but it may be well to remark that the table will be of little practical value unless care be taken that the various substances are in proper condition when used. Anhydrous carbonate of soda will not long retain that condition even in a carefully stoppered bottle, while the corresponding potash salt is of so hygroscopic a character that it is necessary to carefully dry it immediately before weighing. The hydrates of potash and soda, again, are liable to another species of change being gradually converted by absorption of carbonic acid from the atmosphere into the corresponding carbonates, while the sesquicarbonate of ammonia, as has been recently shown, is an even more unstable compound still.

TABLE.

EQUIVALENCE OF THE ALKALIES.

Caustic Soda.	Caustic Potash.	Ammonia.	Carbonate of Soda (anhydrous).	Carbonate of Soda (cryst.).	Carbonate of Potash (anhydrous).	Carbonate of Potash (cryst.)	Sesqui-carbonate of Ammonia.
1	1·400	0·425	2·650	7·150	3·450	4·350	2·115
0·714	1·	0·304	1·893	5·107	2·464	3·107	1·510
2·353	3·294	1·	6·235	16·823	8·117	10·235	4·976
0·377	0·528	0·160	1·	2·698	1·301	1·641	0·798
0·140	0·196	0·059	0·370	1·	0·482	0·608	0·295
0·290	0·405	0·123	0·768	2·072	1·	1·261	0·613
0·230	0·322	0·098	0·609	1·644	0·793	1·	0·486
0·473	0·662	0·201	1·253	3·380	1·631	2·057	1

So far as the table goes, the figures fairly represent the comparative combining values of the different alkalies; that is to say, they

show in a concise form the relative quantities of each required to neutralise a given quantity of, say, sulphuric acid; but that they necessarily represent the relative developing values of the separate substances is far from being as readily conceded. So far as the caustic alkalies, on the one hand, are concerned, or, on the other, the carbonates, it may be possible by the application of the table to arrive at very nearly equal results as regards energy when ringing the changes upon the different substances in either class, but not so in a comparison of the two classes, as in substituting a carbonate for a caustic alkali.

In an article in the ALMANAC for 1885, I endeavoured to explain the important difference that exists between the two classes, having found it impossible after a long and protracted series of experiments to establish any reliable comparison based on their respective alkalimetric values between the hydrates and carbonates. The explanation given is, briefly, that, whereas the caustic alkali or hydrate represents developing power unchecked, the carbonates are developing agents with the addition of a restrainer—carbonic acid.

To more clearly illustrate my meaning, let us take equivalent proportions of, say, caustic soda and anhydrous carbonate of soda, and saturate each with sulphuric or oxalic acid. The same quantity of acid will neutralise one part of the hydrate, or 2·65 parts of the carbonate, forming in each case the same quantity of sulphate or oxalate of sodium; but in the former an atom of water, in the latter an atom of carbonic acid. If now, instead of applying the alkalimetric power of the two substances to the conversion of the acid, we apply it simply to developing purposes, we have, in the one case, the untrammelled action of a definite quantity of sodium hydrate in the presence of water only, while in the other, precisely the same quantity of the hydrate is at work, but held in check by carbonic acid. The difference is precisely of the same kind as if we attempted to compare pyro and ammonia without bromide with the same mixture *plus* the bromide.

If any one doubts the restraining influence of carbonic acid, it is easily proved by using equivalent proportions of a caustic and carbonated alkali side by side, or by attempting to develop with a bicarbonate. Some years ago there was obtainable in London an aerated water that passed as soda water, but which really consisted merely of distilled water charged with carbonic acid gas. This formed a very ready means of testing the restraining power of free carbonic acid in solution. A developer of plain pyro and ammonia, mixed with the so-called "soda water" freshly opened, exerted absolutely no developing action upon an exposed plate for some minutes, or, until by exposure to the atmosphere, much of the carbonic acid had escaped. Then, when development did commence, it proceeded gradually and in perfectly normal fashion without fog. Under quite similar circumstances, except that plain water was used instead of the "soda water," and still without bromide, the image flashed up almost immediately the developer was applied, and the plate quickly fogged for want of an adequate restrainer. In the first instance, a portion of the dissolved carbonic acid would remain as carbonate of ammonia to act as restrainer after the whole of the free acid had escaped, and so the solution became permanently restrained.

This, of course, explains why developers containing carbonates can be employed without bromide, while those made up with ammonia, caustic soda, or potash, cannot. It will also, I think, make it clear to most readers how practically impossible it is to compare, on the mere basis of their alkalimetric values, caustic and carbonated alkalies. At the same time, the accompanying table will be found of value in comparing members of the same class one with another.

W. B. BOLTON.

PHOTOGRAPHIC CRITICS CRITICISED.

[North Middlesex Photographic Society.]

ON Tuesday evening, April 2, at six o'clock, I found myself at the Camera Club and in a common difficulty. I wanted to be in two places at the same time. On the one hand, I was anxious that night to accept the proffered invitation of the members of the Hackney Photographic Society to dine with them; on the other hand, I wished to remain at the Camera Club and follow the proceedings of its Annual Conference, which had opened that afternoon. I shall not trouble you with an analysis of the reasons that finally decided me to forego the dinner for the Conference, but will pass at once to the statement that at the conclusion of the meeting I had every inducement to feel that I had enjoyed myself quite as much as I should probably have done at the Hackney dinner table.

For this unlooked for result the nature of the evening's entertainment was chiefly accountable. Mr. George Davison, the Hon. Secretary of the Camera Club, had skilfully contrived to import great variety and contrast into his programme. He rang up, so to speak, on that austere classical drama, *Hurter & Driffield; or, The Relation of Speed to Density*, in which those exceedingly earnest and experienced actors Professor Armstrong, Mr. Sterry, and Mr. Cadett, supported by numerous auxiliaries, played their usual parts. Then, shrewdly desirous of sending his audience away in a light and happy frame of mind, Mr. Davison drew upon the resources of his stock company, and wound up with a diverting farcical comedy called *Criticism*, in which the well-graced popular author, the Rev. F. C. Lambert, carried off the chief honours. Mr. Lambert, in his breezy but kindly fashion, rated, reprimanded, and ridiculed the photographic critics to his heart's content, and was rewarded by unceasing ripples of merriment from a house with whose applause not a single expression of dissent was mingled. You may, therefore, understand how very enjoyable all this was to a disinterested onlooker like myself. Still, notwithstanding the pleasant and soothing manner in which Mr. Lambert's victims were placed on the stage of the microscope, he was obviously so much in earnest in his attacks, and so manifestly invited reply, that it would be generally regrettable, and I am sure disappointing to him, if nobody took up the case for the defence. This is a task, then, which I propose undertaking to-night, and not even a sense of my unworthiness to meet so formidable yet so agreeable a foe as Mr. Lambert, can reduce the pleasure I feel in bringing such a topic before those who are listening to me, and amongst whom, I know, are many who take some interest in it.

THE IDEAL CRITIC.

Mr. Lambert was at great pains to define the qualifications of an art critic, and I am persuaded you will agree with me, that while he has by no means overstated them, they probably do not, and never will find simultaneous existence in any one man condemned, either for his sins or a living, to write art criticisms. "A critic," said Mr. Lambert, "must help to form, guide, and influence public opinion; he must not express opinions from his own point of view, but stimulate thought in his readers. He required much patience, observation, judgment, and large-hearted power of appreciation; he must sometimes be cruel to be kind, especially to the young. Wise fault-explaining (not finding) might often save a worker from falling into wrong paths. He must keep a keen watch for affectation or mannerism, and for true originality (not eccentricity) criticism is often considered equal to fault-finding—it is just as much virtue-finding; it should be absolutely impartial and open-minded. Amongst the functions of a critic were: (1) To utter little known truths, and to point out truths liable to be missed; (2) to instruct the public in the theory of art (the lay observer of art thinks he is as good a judge as the producer); (3) to defend original artists against the ignorant; (4) to hinder living artists from acquiring a fame by trading on the public by pointing out that a mechanical trick is not art, but jugglery; (5) to keep green the memory of great men, often not recognised until they have been dead a long time; (6) must be always criticising himself, and looking out for his own defects, and be suspicious that his standards are partial (good workers in certain works are generally not good critics, there is a tendency to partiality); (7) absolute honesty of purpose—must not bolster up any particular school or kind of work; (8) must be continuously endeavouring to enlarge his powers of sympathy and observation—be broad-minded; (9) must keep himself informed as to what is being done and thought by prominent workers in particular directions." This, as the familiar saying runs, is a large order. I wonder how, when, and where, such a paragon of critical acumen is to be obtained. Does Mr. Lambert suggest a training school for critics who shall be required to pass a test examination before being furnished with a certificate of competency?

CRITICAL "BOSH."

But, having told us what an art critic should be, and inferentially holding him up as a type of what a photographic critic should also be, Mr. Lambert, while allowing it to be felt that he is displeased with the general qualifications of the latter, abstains, no doubt accidentally, from adducing any really specific reasons for his displeasure. Here are, perhaps, the worst things he can say about the offending class.

"In the general press, notices of photographic Exhibitions show lamentable ignorance of the rudiments and principles of art and technique," while, "as regards the photographic press, their notices are not satisfactory, and are often useless, being sometimes merely repetitions of the catalogue with a few remarks thrown in." Criticisms, he thinks, should be fu'ler, should be better, and should be signed; and then, if I correctly heard and understood him, when these things came about there would be an end of what he amiably called the "bosh" that is written as photographic criticism.

There are, by the way, two kinds of "bosh:" the "bosh" that is written, and the "bosh" that is talked; and it would be amusing to have an estimate as to which preponderates.

Now, I do not think that, even judging him by the heaven-soaring standard Mr. Lambert has set up, the photographic critic is quite so worthless an institution as he is made out to be, and as I shall try to show. I can imagine that *if* a photographic critic were reading this paper to you he would say a great deal of what I shall say—indeed, I am not reluctant to admit that I have liberally availed myself of the inspiration of a photographic critic of some years experience, so that you can almost fancy it is one of the class Mr. Lambert has lashed that is addressing you.

For the Defence.

First, then, before entering upon a main line of defence, let me say that, if the ignorance of the general pressman in regard to photography be admitted, it is an argument in favour of specialised criticism, with which Mr. Lambert does not seem to be content, inasmuch as the ideal critic he asks for would surely not be found humbly going the rounds of photographic galleries. He would, I take it, be too intellectually proud and great to worry himself over such comparatively small potatoes. Your general pressman, I grant, frequently blunders in his photography, and knows little of what is vaguely called "art;" but, as a rule, he is intelligent and honest in his opinions, and has no fancy for cloaking his ignorance or malice in the cloudy and gilded generalities of the so-called "art critic." He writes, it is to be presumed, for the information and not the instruction of the general, as distinguished from the photographic, public, and therefore is relieved of the necessity of possessing many of the qualifications Mr. Lambert considers essential in his ideal critic.

As to the photographic criticisms of the English photographic newspapers, is it really the case that these are generally so unsatisfactory as Mr. Lambert appears to think? His illustrations in proof struck me as being singularly ineffective to uphold his contentions. For example, he quoted one writer as submitting the following as an effort of photographic criticism:—"Mr. So-and-So is represented by four frames." Now, to me, it is easily conceivable that, under some circumstances, this phrase, absurd as it looks when detached from its surroundings, might carry a weight of critical wisdom which Mr. Lambert or somebody else failed to perceive. I will give a counter-illustration. I am vividly reminded of the end of the right wall nearest the door of the Dudley Gallery, which, when the last Salon Exhibition was open, was adorned by, among other things, some deep, flat, green-painted rough-wood frames, which arrested and held one's attention, to the exclusion of the comparatively small photographs they adorned, and to which the "criticism" quoted might have been fairly applied, the aim of the writer possibly being to satirise the vagaries of photograph framing in which some photographers nowadays indulge.

If this is a fair specimen of what Mr. Lambert calls the "bosh," to which he objects, I humbly submit that it does not justify the use of the term. And even "repetitions from catalogues, with a few remarks thrown in" of which he complains, may be easily defended as giving, where necessity compels conciseness, an idea, or "general impression," to use Mr. Lambert's own words, of the kind of work that is hung. Suppose, for instance, any one familiar with Exhibition photography read in a paper the following sentences: "Colonel Gale is represented by Nos. 40–43, four of his characteristically crisp pastoral and ploughing scenes; and Mr. Alfred Maskell by Nos. 1–20, a series of inscrutably impressionistic seascapes and landscapes, looking like crude crayon sketches appropriately surrounded by dead black frames," don't you think the reader would be able to conjure up a mental idea of what those photographs were like, which columns of descriptive matter might not convey to him? I wonder how Mr. Lambert's ideal critic would act in such an emergency, and how many gems of artistic thought he would compress into the same space!

There is no doubt that in the last few years photography has advanced both in its methods, variety, scope, and freedom of artistic expression; but, if Mr. Lambert is to be trusted, the photographic critics have not correspondingly broadened their sympathies, their powers of appreciation, or acquired the fine capacity of entering into the meaning, the intentions, the aims, and the ambitions of the photographic worker. I believe Mr. Lambert to be, in the general sense, mistaken. Public photographic opinion is, on the whole, averse to highly fuzzy or impressionistic photographs, and the photographic critics were probably the first to stigmatise their absurdity. Who are more severe on what Mr. Lambert calls affectation, mannerism, or eccentricity? Would a modern photographic critic tolerate a landscape with a white sky, or a "commercially retouched" portrait of a pretty woman, even on the walls of the Salon? Does Mr. Lambert find among the critics evidences of partiality or dishonesty or a lack of effort to form, guide, and influence public opinion; of a particular anxiety to bolster up universal sharpness of definition and condemn every other plan of focal treatment; an inability or a determination not to recognise originality or merit however expressed; an excessive or a sparing use of superlatives; a too great or too small disposition to deal out praise or fault-finding? Or are we to condense all the sins, real or imaginary, of the photographic critics into the one offence that they do not or cannot pose as "art critics," and do not or will not express their feelings in the showy but meaningless jargon of that unhappy school of writers?

Signed Criticisms.

Then, Mr. Lambert wants criticisms signed. When I was a small boy I was editor of a manuscript or ever-circulating magazine, and this question of signed *versus* unsigned articles was a pet subject of discussion with my contributors and myself; and to-day in the larger world of letters it is constantly cropping up. More critical articles are now signed than formerly, but I am of opinion that the substitution of the first person singular for the first person plural is regarded with indifference by the general reader, and that the photographic reader is similarly unaffected. Mr. Lambert, however, and those who take as much interest as he does in exhibition matters, are surely in a position to know that the photographic critics are almost to be counted on the fingers of the hands, and that by placing their signatures to their respective critiques no secrets would be revealed. On the other hand, opinions on this point differ, for Mr. G. H. James, who joined in the discussion at the Camera Club, was in favour of unsigned criticisms, which, if impartial, would be much valued; and Mr. Roland Briant thought criticisms were harmful to the public, and that it would be a better thing if there were no criticisms at all printed. It is not difficult to have considerable sympathy with Mr. Briant, of all men, in this pathetic observation. My own view on the question of the signature or non-signature of critical articles is that a writer, when assuming the disguise, however thin, of editorial concealment, insensibly exercises more caution, care, and deliberation in his remarks, by reason of a feeling of greater responsibility towards his paper and its readers, than when writing, as it were, for himself, and himself alone. But, in the latter form, the man's individuality finds greater scope, of course, and in the exact degree of interest which that individuality excites, so will his opinions or advice be noticed and valued.

Photographic Critics should be Photographers.

The critical columns of a newspaper, a journal, or a review, are those in which I find my favourite day-by-day reading; and whether it be books, picture-shows, or plays, the manner, as well as the matter of the notices, has far more charm and attraction for me than the other contents of the paper. It is this habitual study of all kinds of critical writing which fortifies me in joining issue with Mr. Lambert, and denying that photographic criticism, gauged by the test of relative comparison, deserves the low opinion he has formed of it. It is every whit as impartial and as appreciative as any form of recognised "outside" critical writing, and in other respects, which perhaps it would not be becoming of me to specify, probably does not suffer by the comparison. The sins Mr. Lambert has laid at the door of the photographic critic, are mere venialities when contrasted with the crimes of some book reviewers; while, as for the performances of the art critics, the "bosh" of which they are continually guilty defies realisation. Let exhibiting photographers, therefore, take comfort in the assurance that the photographic critic, by comparison, is not so black as Mr. Lambert has painted him; and if my assurance is not sufficient, let them study art and literary "criticism" for a year or two.

I am not going to give a definition of my ideal photographic critic; but I will say this, that we are all critics, more or less, and that some of us are born with the developable critical faculty, *plus* the appreciative instinct and a love of all that is poetical, beautiful, graceful, lofty, noble, and good, as I infer Mr. Lambert to desiderate, and that possibly the critic's pen is best intrusted to one possessing such characteristics. It is essential, I think, that he should be a practical photographer, with a knowledge, if not a mastery, of photographic processes, for, as I ventured to plead in this room, nearly three years ago, the technique of a photograph is not

inferior in universal interest or importance to its artistic qualities, but, it is not necessary that he should either be an exhibitor or a judge at photographic Exhibitions. Above all, let our photographs be judged *as* photographs, and *by* photographers; and let them not become the sport and playthings of the art critic, who, utterly ignorant of photography's limits and possibilities, solely relies for his assumption of critical authority upon the faculty with which he can exude innumerable hackneyed and meretricious verbal gaudinesses, such as "harmonious feeling," "subtle tonality," "delicacy of sentiment," "scheme of tone," "tenderness of treatment," "luminosity of contrast," "decision of conception," &c., the trick of which is easily acquired, and constitutes you an art critic straightaway. And, again, let us not pander to the art-judge, who, being also ignorant of photography, gives his awards on erroneous grounds, and, as we saw last year at 5A, Pall Mall East, sets about 11,000 people laughing at his blunders.

A Photographic Critic's Ideals.

But Mr. Lambert not only wants better—that is, I suppose, greatly more sympathetic—criticisms, but fuller ones, and other gentlemen, taking Mr. James as a type, which possibly he is not, want more analytical, and therefore more helpful ones. As to fuller criticisms, which means, I suppose, that the papers are to devote greater space to such notices, the idea is perhaps worth consideration, although there are practical and other difficulties in the way of its adoption. You see, the photographic critic is only human (which Mr. Lambert's ideal critic could not be), and therefore, with an eye to the subscription list of his paper, he probably "gives a line" to everybody he conveniently can, and has consequently to be so concise in his remarks that both Mr. Lambert's and Mr. James's aspirations are almost impossible of realisation. At the same time, you can conceive of the photographic critics retorting that their criticisms might be more fully and carefully done, and so brought perceptibly nearer Mr. Lambert's ideal if certain essential conditions were complied with. Here are some of the conditions which might be laid down :—

1. Fewer Exhibitions.
2. Smaller Exhibitions.
3. No medals.
4. No classes.
5. The rigorous rejection of indifferent or commonplace work.
6. Better facilities for the critics to do their work unhampered.

These conditions so eloquently plead their own cause that nothing need be said in support of them, I am sure.

My friend from whom I have drawn all the information contained in this paper has had some experience of the difficulties under which Exhibition work sometimes has to be done, which might tax even the skill and patience of Mr. Lambert's ideal critic to surmount and produce a criticism invested with coherence, let alone free of "bosh." To have to exercise "patience, observation, judgment, and large-hearted powers of appreciation" without the guiding illumination of a catalogue, is a common problem. To "keep a keen watch for affectation or mannerism and for true originality," with an immovable throng of ladies and gentlemen three deep in front of the photographs, is not an easy matter; while the operation of that "wise fault-explaining" which "might often save a worker from falling into wrong paths" becomes, under the stimulating influences of a noisy band or a storm of society small chatter, only too invitingly and fatally easy in the wrong sense. Mr. Lambert admits that the gifted being for whom he pleads is an ideal one, but says that that is no reason why he should not ask for him. I think I have shown that the conditions under which he would have to work would also, like the individual, have to be idealised. It is a pretty and perhaps not altogether unprofitable practice, that of setting up ideals and striving to reach them; but this is not, and never will be, an ideal world in any single respect whatever.

I conclude by a last word in defence of photographic criticism, and submit that it is quite up to the level of what is demanded of it. At any rate, Mr. Lambert and one or two exhibitors of unintelligible photographs and eccentric experiments in framing are, so far, the only persons who have expressed dissatisfaction with it, and this I have tried to show has largely a fantastic or unsubstantial basis. I am conscious that the monosyllable "I" has made a rather frequent appearance in the course of what I have said, and, if this seems to you an excessive display of egotism, yon have my hearty invitation to retaliate upon me in the manner that best commends itself to you.

Thomas Bedding.

SOFTNESS OF DEFINITION.

Mr. Dunmore's paper on the above subject opens up a question which has always had a special interest for me.

I am glad to find that Mr. Dunmore is sound on the "fuzzy" question, and, if I may seem to criticise his remarks, he will at the same time understand that, in the main, I am at one with him all through.

My first difficulty with Mr. Dunmore's paper is as to what he means precisely by the word "definition." I, of course, quite well understand the ordinary meaning attached to the word in photography, and I only want to know if, by this, he means sharpness of outline? This may seem a splitting of straws, but I think the term "definition" rather wide without some explanation. It is plain that no photographic lens, good or bad, can leave out anything which comes before it, and I think therefore that "definition" may safely be considered synonymous with sharpness of outline. By outline I mean, of course, not only the edge of natural objects, but also the edge of, say, a shadow. Now, Mr. Dunmore says "that a photograph must be absolutely sharp all over to be good is just as wrong as that one with few points of sharpness must be bad." Here, again, Mr. Dunmore eludes me by the word "good." I want to know by what standard he judges so, that I may know what he means by "good." Does he mean true to nature or true to art?

In these days of art culture, when every one has ideas on the subject, a writer must indicate whether he leans to the imitative school or the creative; in other words, does he think a picture must represent something, or may it be a "thought," in black-and-white, or an "arrangement" in colour, and still be a picture?

I judge, from the general tone of Mr. Dunmore's article, that he is not likely to be one much taken with "thoughts" in black-and-white, or "arrangements" in colour, and, therefore, assume that, by "good" photograph, he means one true to nature. Now we come to close quarters. I say that there is no warrant whatever for *any* part of a photograph being out of focus, that is, being visibly out of focus at the correct distance for viewing the picture.

Let us go to nature first. By what process could such a condition of outline as one sees in a fuzzy type be produced? Not certainly by "atmosphere," as artists term the haze which obscures the distant part of a landscape, for atmosphere has no special obliterating effect upon the outline of an object. I can understand a bank of fog softening the outline of a hill; but, in this case, the outline of the hill is obscured altogether, and the outline of the fog, *which is a fuzzy one*, is substituted.

Again and again I have looked for this softening effect which writers will persist in crediting atmosphere with, and have never once observed it.

In a clear atmosphere, the intensity of the more distant parts of a landscape is greater than when there is a mist or haze and the contrast with the sky, consequently, more telling, but it is no sharper. Not long ago I had an excellent opportunity of observing a landscape under a thin fog, and I noticed very particularly what happened. In no case was the extreme outline of an object rendered "fuzzy."

The very distant hills were robbed of both light, and shade, and colour, but the faint outline was there "razor" sharp, though a mere tint darker than the sky.

As the eye wandered into the middle distance, the greater masses of light and shade were made out, and here also, although the mist robbed the landscape of all colour and all but the greater contrasts in light and shade, there was no trace of "fuzzy" outline. The masses that could be made out were tame and flat, but the outline quite as sharp and forcible as could be expected from the weak gradations.

I see it mentioned sometimes that artists, to produce effect, are in the habit of softening outlines here and there, and this is taken as a warrant to throw part of a photograph out of focus by some photographers. That artists are in the habit of losing a little of the outline here and there, to break up a long line, is quite true, but the remainder is there quite sharp, and the eye fills in the form of the object, not as a "fuzzy" object, but as a perfectly definite one. No artist ever attempted to produce effect by painting any part of his picture after the manner of an out-of-focus photograph. If there is anything more than another that denotes the master, it is the clear, crisp touch of decision in his brush marks, and, if there is anything more than another that denotes the learner, it is the "out-of-focus" effect that he produces by his tentative niggling a hundred times over the same line.

Neither in nature nor in art is there warrant for the out-of-focus dodge. To partially suppress the intensity of an outline here and there throughout one's photographs would indeed be a great power, but it must be under the control of the artist. If I can only soften that hard corner of the hillside by sweeping that entire plain of my picture into confusion, I must do without the power.

Mr. Dunmore says: "Nature invariably provides sharp foregrounds,

indistinctness gradually increasing with the distance." Yes—so far true—indistinctness, in so far as light and shade are so modified as to give a flat and quiet effect, but never the effect of a "fuzzy" photograph. With every other part of Mr. Dunmore's excellent paper I heartily concur, and I finish with one remark, The traditions of photography are against it, and the old hands—some of them, at any rate—the worst sinners. It has always been held that *the* day for photography was the bright, clear, cloudless day, and that a trace of atmosphere was fatal to success. Old hands would lecture upon the folly of taking a picture against the light, and suchlike; but all this is changing now, and we are beginning to find out that the photographic plate has the power of expressing nature in her many moods, and not only when the sun is high in the heavens and the whole landscape blinking in brilliant sunshine. As an old hand, I admit the difficulty I have in throwing off the old notions and attempting photography under conditions of atmosphere and light and shade such as at one time I would have thought nothing short of folly; but I struggle against the feeling, and my successes are numerous enough to encourage me to persevere.

J. K. Tulloch, M.B.

THE EXAMINATION OF PHOTOGRAPHIC LENSES.*

Flare Spot.—Flare spots arise from reflections on the surfaces of the lenses, and the greater the number of reflecting surfaces the greater the likely number of flare spots. The task of the optician is to bring these flare spots—or, to be correct, their foci—away from the general focus of the whole system, and thus make them ineffective by spreading them over as large an area as possible. Most lenses will, under trying circumstances, show some flare spots. Single landscape lenses, having though only two surfaces, often show flare spots through the stop being in the wrong place, when an image of the stop will appear on the plate. But it is a well-known fact that, generally speaking, landscape lenses have clearer and more brilliant images than doublets or triplets, because they have only two reflecting surfaces, and it is all the easier to spread the reflecting images over a large area at the plane of focus. Flare spots may be measured by sticking a small piece of silvered mirror inside the focussing screen, just by the side (not on) the axis of the image. This will throw the reflections back, and they will appear as smaller or larger circles on the screen. When large, they are of little or no account; when small, the lens is faulty, and the combinations should be put nearer (tube shortened) or the place of the diaphragm altered.

There is more to be said on this point, but I pass on to the last item.

Distortion.—This brings us round to the beginning of our subject, as it is one of the most elementary points in the modern lens. No modern lens suffers from it, and even landscape lenses are, within a narrow angle, practically free from it as now constructed. In applying the tourniquet to the detection of distortion, we have to distinguish between the movement arising from the lens not being centred and that from distortion. The latter increases with the angle, and when negative, suddenly ceases and goes back. In most cases the examination of an ordinary camera will suffice.

Should the behaviour of a lens during examination arouse any suspicion as to the quality of the glass, its homogeneity, or suggest the presence of striæ, it will be advisable also to examine it from this point. Few lenses are absolutely free from slight differences in the density of the glass, but seldom is a good lens found which has such a fault to any remarkable degree.

A very simple way of testing will suffice to convince us whether any striæ are present in our lens. We focus in a dark room on to a gas flame or burning candle, remove the ground glass, and look from the point of focus right into the lens, which will appear full and evenly lit up. We now move a little sidewards and find, keeping our eye fixed on the lens, that a slight movement of our eye suddenly makes the lens look dark. If this is the case all over the lens, we have an even and homogeneous mass of glass; but when we observe a few light streaks or spots on the lens they surely indicate faults of the glass. If these streaks are numerous or large the lens should be returned to the maker, and the faulty elements replaced, White spots would in most cases indicate faults on the surface of the lens, produced by careless and unsatisfactory polishing; or in old lenses, surface defects in the glass where they have been carelessly handled. These are, of course, of less importance, and do are scratches on the surface, which will show very sharply by the above mode of examination. It must be understood that the lens must be perfectly clean before put to this test, and it will be advisable to wipe it well with a soft silk handkerchief or a moist washleather, and then dry it with the handkerchief; for as faults on the surface of the glass will show, so would dirt spots and grease marks and dust show and make the lens look very much worse than it really is.

I propose now to pass through the lantern diagrams of the latest forms of lenses.

In slide No. 12 we have the form of the aplanatic doublet produced by Steinheil in 1866, composed of two flints. The form, you see, is like built round a circle; that is, it embodies the principle of the sphere as the one uniting most advantages for lenses of such apertures as *f*-6, *f*-5, *f*-7, &c. A heavy and a light flint, as the Steinheil type had them, were used on account of their comparatively large difference in the dispersion.

The rectilinears, symmetricals, or other lenses of that time, were all constructed on the same principle, and have proved by their great popularity and general usefulness the excellence of that form of lens.

We pass on to the next type, also by Steinheil, and produced in 1881—the Antiplanet.

The construction of this objective involves a different principle altogether from that of the aplanatic class. It has the advantage of allowing greater freedom in the choice of glasses and curvatures of lenses.

Within given limits, the antiplanets are superior to the aplanats, because the two factors of curvature and of astigmatism are more independent of one another.

Steinheil went to work on new lines altogether; he composed his system of lenses of elements having the opposite defects, which he took no trouble to diminish in the one or the other, he took only care that one set of lenses should have so much spherical aberration of a positive nature as the other had of the negative. He compensated the chromatic aberration in the same manner. This gave him a free hand to go for astigmatism, which he diminished considerably, and obtained thereby a sharp image over a comparatively wide field.

The aperture of his group antiplanet was *f*-5·56. The slide shows the radii of curvatures for a lens of nine and a half inches.

You also see that he went back to flint and crown combinations.

This lens has since been modified in so far as the back lens is made of three elements, the exact features of which I have not been able to ascertain, but evidently done with the object of obtaining better correction of the astigmatic error, by the superposition of elements of opposite characteristics with regard to dispersion and refraction.

They are, in fact, two flints enclosing a crown.

His portrait antiplanet (not antiplanat, as sometimes called) is less well known but equally good in its way. This lens comes to one's mind when reading the particulars of the new combination by Mr. Dennis Taylor, lately laid before the Royal Photographic Society, and of which we shall come to speak presently.

Steinheil patented the antiplanet in Germany, England, and America.

To the same class of lenses belong the anastigmatic lenses invented by Dr. Rudolph (Zeiss & Co.).

They are to all intents and purposes antiplanetic objectives, not absolutely in the sense of Dr. A. Steinheil, but they also throw the task of the correction for astigmatism on one lens, while the other combination is responsible for chromatic and spherical aberration. At the same time it must be pointed out that either combination in the anastigmats is achromatic, or nearly so. The principle is expressed in the patent specification, by saying that in one combination the positive element must have a greater index of refraction than the negative lens with which it is combined, while in the other the *negative* must have the greater refractive index than the positive element to which it is cemented.

The triplets are also a kind of antiplanets, though not planned on the same principles.

The most notable of these is Dallmeyer's triplet, which was produced in 1861. The characteristics are two positive lenses with a negative lens between them.

A different principle is embodied in the tele-photo lens, invented in its new form simultaneously by Dallmeyer, Miethe, and Steinheil. It is, roughly speaking, a positive lens combined with a negative lens; both are in all cases combined lenses.

As mentioned before, the negative lens refracts the rays coming from the positive lens in a negative sense, and the curiosity from our point of view is this, that the principal point of the system lies entirely outside it, and a long way in front of even the collecting lens as shown in diagram. Photography of distant objects, therefore, becomes easy even with a moderate draw of camera.

As in many things in human evolution, there is, after a special development, a return to the old forms. So in the chapter of lenses. After the anastigmats have had their day, the symmetrical form again came up, first of all in the Goerz lens, which is a *Zeiss* built upon symmetrical lines.

The Goerz lens was not to stand alone for a long time. Both Voigtländer and Steinheil followed with their collinears and orthostigmats, and Zeiss himself worked out new forms in a combination of lenses having each half *four* elements, to be combined with another four-element lens of various foci.

The collinear, by Voigtländer, a symmetrical doublet, each combination consisting of *three* lenses, two positive and one negative. Each of these is suitable for work as a single landscape lens of double the focus of the pair.

The makers claim entire novelty for the system—almost absolute elimination of the astigmatic error, and soundness of the glass employed. The curves and material employed have not been obtainable.

Steinheil's Orthostygmat.—Another pair of symmetrical lenses, each of three elements, obtained by combining special glasses of Jena make, all of which are said to be uninfluenced by atmospheric action.

The combinations consist of a biconcave lens, B, a biconvex lens, A,

* Continued from page 268.

and a positive meniscus lens, C. The biconvex, A, has the greatest refractive index of the three; the biconcave has the greatest dispersion; the convex-concave a medium refraction and dispersion.

The principle of this correction is expressed by Steinheil when he says that, before 1890, it was hardly possible to go very far in the correction for astigmatism while at the same time correcting the lens for chromatic and spherical aberration of oblique pencils. In the antiplanet the advantages of good corrections were gained by combining a positive lens of flint with a negative lens of crown, while the companion lens had a positive element of crown and a negative of flint, this latter combination being of slight negative focus; and, further, that, in order to correct for astigmatism, it is necessary that the curvatures between two lenses of a combination must be so that the glass with the weaker refraction must turn its concave surface towards the lens with the stronger refractive power, while the spherical aberration is corrected by a combination where the less refractive glass turns its convex curvature towards the element of the greater refractive index.

This condition is fulfilled, not only in the Zeiss anastigmats and other similar combinations, but also in the antiplanet constructed ten years previous to the anastigmat.

The idea was, therefore, propounded by Steinheil, though the material to carry it out completely was not at hand until Schott & Co. produced their new glasses.

We have finally to consider a new lens of English make by H. Dennis Taylor, of York (Cooke & Sons). The lens is a triplet and belongs to the antiplanets, though Mr. Taylor designed, and showed a lens (Series I.) with an aperture of *f*-4, which is symmetrical, but he departed from that form afterwards in order to obtain flatness of field and freedom from spherical aberration.

The slide shows Series III. of the aperture of *f*-5·65, covering an angle from 55 to 65°.

The outer lenses are positive and dissimilar, of hard crown, a negative lens of a "kind of plate glass," to which is cemented a meniscus of "Schott" hardest baryta crown.

The burden of flattening the field is thrown, according to Mr. Taylor, on the negative lens, and not on the stop.

We have here again some of the characteristics of the Steinheil antiplanet—the portrait antiplanet, which itself is a step from the Petzval portrait lens.

With regard to the antiplanet, it bears this distinction, that the diaphragm is placed before the negative lens, and, it may be remarked, that the Steinheil lens may be turned round without any detriment to its working perfectly.

The merit of the Taylor lens is its simplicity of construction, there being no cemented surfaces in several of the systems, except in the No. III. shown. Mr. Taylor claims that his lenses could have been constructed of the old hard crowns and flints, and are independent of Jena glass.

I must, however, point out to you that, in the system projected on the screen, there is one of the Jena species, and, moreover, that when we look at the new tariff of Chance Brothers & Co., we find a much more complete and varied list of glasses than those of former days. These could be counted on the fingers of one hand, while now they have a list running up to a dozen different kind of glasses, amongst which we find several silicate flints, barium crowns, light, medium, and heavy flints, hard and soft crowns, in fact, a variety akin to that at Jena.

It is greatly to their credit that they should have been put on their metal, and brought their productions up to date.

I now conclude this paper, which I regret has been drawn out to an inordinate length. I have not been able to deal with the subject adequately, partly through my own defective knowledge, partly through the magnitude of the matter which would require, not one, but three evenings. If I have, however, been able to clear up here and there any one dark point in the understanding of some of my listeners, I am well satisfied.

J. R. Gorz.

THE AMMONIUM CARBONATE DEVELOPER.

II.

In my ninth experiment I again chose an architectural subject, but this time one of a more exacting character.

The building, a high-gabled, turreted mansion-house of seventeenth-century date, formed two sides of a courtyard, with an entrance at the inner angle. At a comparatively recent date the walls had been inartistically coated with a wash of yellow ochre. Moreover, the small walled enclosure or park in which the edifice stood was abundantly provided with trees, several of the taller of which were situated within a few feet of the narrow footpath which ran round the building. The irregular disposition and varied tones of these different masses, together with the overlapping of the different lights and shadows, were productive of a great deal of contrast, which it was found difficult to reproduce faithfully in the picture.

The exposure was made shortly after midday, in a very dull light, and was of eight seconds' duration. The following developer was employed:—

Ammonium sesquicarbonate	12½ grains.
Potassium bromide	½ grain.
Pyro	2¼ grains.
Water	1½ fluid ounces.

The outlines of the image appeared with faintness in about a couple of minutes, but gained in density so gradually, that not until twenty minutes had elapsed did the development reach its final stage.

Taking into account the peculiar character of the subject, the resulting negative was, from a photographic point of view, fairly satisfactory. Though thin, it was very sharp, and the contrasts of the original were not over-accentuated. The details were rendered with a certain crispness more like that which one is accustomed to associate with a good negative that has been produced by the collodion process.

The tenth experiment was made on November 13. The subject in this case was a church, surrounded by trees. The contrasts were again rather heavy, but less so than in the preceding experiment. The exposure was made a few minutes after noon, during an interval of bright sunshine, and lasted for six seconds. The developing bath was made up according to the formula employed in the previous experiment.

The plate having been immersed in the solution, the image began to reveal itself in about two minutes' time. Sufficient density was not obtained, however, till other thirteen minutes had elapsed.

In the finished negative the only noticeable defect was a lack of gradation, there being apparent a certain hardness of effect, arising from the want of a stronger connecting link between the high lights and deep shadows, both of which, on account of this deficiency, were rather unduly emphasised. The defect might perhaps have been rendered less apparent by the choice of a developer containing twice as much potassium bromide as was present in the solution actually employed.

The eleventh and twelfth experiments were made on November 23. The old mansion-house that was photographed in the ninth experiment was again chosen as a subject.

On the present occasion the atmospheric conditions were sufficiently favourable to permit of both the exposures being made in moderately bright sunshine.

This circumstance afforded me an opportunity for making an experiment of a novel kind. Hitherto I had tested the qualities of the developer under conditions which precluded my forming any opinion as to its behaviour in cases of exposures of very short duration. I now decided to go a step further.

Accordingly, to my first plate—exposed at 12.20 p.m.—I gave a greatly reduced exposure, the estimated duration of which was about one-fifth of a second.

The formula adopted for the preparation of the developer was a modification of that already given under the ninth experiment, the sole difference being that the weight of potassium bromide now taken was only a quarter of a grain, instead of half a grain, as in the former case.

Ten minutes' immersion in the solution produced a faint and almost invisible outline of an image. It was very soon apparent that nothing more than an outline would be obtained; but, in order to make assurance doubly sure, the process of development was continued till the plate had remained for forty minutes in the bath.

On examining the negative by daylight, it was found to be a failure, though the building itself and most of the surrounding objects, including even the smaller branches of the trees, were reproduced in outline with great distinctness. The result was, of course, attributable to insufficient exposure.

The second plate received an exposure of six seconds, at 12.30 p.m., light and subject being the same as before.

The following was the developer employed:—

Ammonium sesquicarbonate	12½ grains.
Potassium bromide	¾ grain.
Pyro	2¼ grains.
Water	1½ fluid ounces.

The image made its appearance at the end of ten minutes' time; but, as the growth of density proceeded with singular slowness, the process of development lasted altogether for no less than one hour!

A moderately good, but rather flat, negative was obtained, the flatness being most noticeable in the case of the high lights. As there was no lack of bromide in the developer, it seemed highly probable that the defect was due partly to the prolonged develop-

ment which the plate had received, and partly to under-exposure. A less restrained developer would probably have produced a better result.

The thirteenth and last experiment was made on November 29. The church already photographed in the tenth experiment was again the subject, and the exposure (which lasted for six seconds) was made in moderately bright sunshine shortly before midday. I employed a developer prepared according to the formula given for the seventh experiment.

In seven minutes' time the image began to make its appearance. When twenty minutes had elapsed, very little density had been gained, whereupon, by way of remedy, I added to the solution three-quarters of a grain of pyro. Finding this productive of little effect, I added a second and similar dose at the end of the next ten minutes. Altogether, the process of development lasted for forty minutes. The negative obtained was decidedly weak and lacking in contrast. The portion of the image representing the sky was of a dense blackness, but in the other portions of the picture the lights and the shadows were blended together, a disagreeable half-tone being the result.

MATTHEW WILSON.

(*To be continued.*)

Our Editorial Table.

INTRODUCTION TO THE SCIENCE AND PRACTICE OF PHOTOGRAPHY

By CHAPMAN JONES, F.I.C., F.C.S. London: Iliffe & Son, 3, St. Bride-street, E.C.

WHEN a somewhat elaborate book of this nature reaches a third edition within a reasonably brief period, it proves an attestation of its value. This edition differs from the previous one, in having been revised throughout. Several new chapters have been added, some of the old ones have been rearranged and extended, and everything done to make it a representative of the present state of the art. Mr. Jones's abilities as a well-informed scientist, and his acknowledged skill as a teacher, combine to make this a work of great value.

Without wearying one with historical matters, Mr. Jones gives us a sketchy outline of leading events in the history of the art, and at once enters upon the chemical principles underlying photography. From this he passes to the optics of the art, thence to forms of lenses, and thus we are ushered into gelatino-bromide negatives, to the preparation and treatment of which we find no fewer than twelve chapters devoted. The various methods of printing—in silver, carbon, iron, collotype, and other mechanical processes—are fully described. In short, we have in the book 320 pages of matter invaluable to the photographer. It sells at the moderate price of half-a-crown in paper, and three-and-sixpence bound in cloth.

ADAMS & CO.'S PHOTOGRAPHIC ANNUAL FOR 1895–6.

A PAPER on Exactitude in Short Exposures, by Captain Abney, is followed by papers on other topics by competent writers whose names have been associated with the subjects on which they treat. These serve to introduce the more commercially useful part of the *Annual*, in the form of a large catalogue and price-list of everything in photography that is desirable or conceivable, and surely here no desire need be left ungratified. Many of the articles enumerated are Messrs. Adams & Co.'s specialities, and, as these and other things are fully illustrated, the volume can be highly recommended as useful for perusal. It contains 500 pages, price 1*s*.

LUMIÈRE'S TRIBASIC PHOSPHATE OF SODIUM.

MESSRS. FUERST BROTHERS, have sent a sample of this salt intended as a substitute for other alkalies in the developer. It is claimed that increased density in the negative is obtainable by using it instead of other alkalies, and while making a few experiments with it, we are of opinion that the claim can be substantiated. It is not an expensive product. The crystals are singularly beautiful.

CATALOGUES.

CITY SALE AND EXCHANGE LIME-STREET, E.C.

THIS is a list of goods by various makers, which can be procured either by way of purchase or on loan at the address given.

"PRIMUS" PHOTOGRAPHIC SPECIALITIES.

MESSRS. W. BUTCHER & SON, Blackheath, S.E., have sent us their new catalogues. Unlike some others, this firm are manufacturers of much of the goods catalogued by them, and this embraces a very great variety indeed. The specialities embrace lanterns and their various attachments; cameras, including ones respectively termed "Primus," "Star," "Lux Mundi," "Airedale," "Walnut," and "Perfect," each possessing some feature peculiar to itself.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 8174.—"Improvements in Photographic Cameras." J. A. FURNIVEL.—*Dated April*, 1895.

No. 8267.—"Improvements in Dark Rooms used in Photography." A. PIPON and J. PIPON.—*Dated April*, 1895.

No. 8307.—"An Improved Camera Finder." S. J. LEVI and A. J. JONES.—*Dated April*, 1895.

PATENTS COMPLETED.

IMPROVEMENT IN CAMERA STANDS TO BE USED FOR ILLUMINATING AND PHOTOGRAPHING TRANSPARENT AND OPAQUE OBJECTS FROM A VERTICAL ASPECT.

No. 9826. THOMAS CRADOCK HEPWORTH, 45, St. Augustine's-road, London, N.W., and THOMAS RUDOLPH DALLMEYER, 25, Newman-street, London, W.—*March* 23, 1895.

THIS invention relates to a method which involves the operation of using the photographic camera in a vertical direction, so that all kinds of objects which are most conveniently placed or arranged in a horizontal position can be more readily photographed than they could otherwise be.

We use a stand of special construction, the chief features of which are a head or top containing a collar, in which the camera rests with the lens pointing downwards, and three or more supporting legs, which may be telescopic in construction, and made of either wood, or metal, or other material or materials either alone or in combination. Each leg should have a sliding piece, which can be adjusted and fixed at any height required. The said sliding pieces would act as supports to a platform of glass or other material, the platform being for the purpose of supporting the objects to be photographed, as may be suitable for the particular work in hand. Alternatively the platform may be hung from the head of the stand by cords running over grooved wheels counterbalanced, and its distance from the lens above regulated as required by this means, in which case the adjustable supports on the legs might be dispensed with. To the head of the stand above described we attach a roller or rollers, from which depends a curtain or curtains, so that the light may be excluded when the apparatus is being employed for photographing transparent objects, as in the reduction or enlargement of photographic negative or positive images on glass, celluloid, or other supporting media. When the apparatus is used as last described, we employ a mirror, placed at any suitable angle below the before-mentioned glass platform, so as to direct the light upwards and through the object which is being copied. In copying opaque objects, we employ the glass or other platform either alone or in combination.

The claims are:—The combination in a photographic camera stand of a means of supporting a camera so that it can be used vertically; a transparent movable platform; a mirror; and a curtain or blind to shut off the light when necessary.

AN IMPROVEMENT IN THE CHAMBER OR REFLECTOR FOR CARRYING THE LAMPS USED IN PHOTOGRAPHING BY THE ELECTRIC LIGHT.

No. 14,492. ANDREW GEORGE ADAMSON, 136, Buchanan-street, Glasgow. *March* 23, 1895.

MY invention has for its object to construct the chamber or reflector for carrying the lamps used in photographing by the electric light so that, while retaining its power of reflection, it will at the same time give an effusion of light throughout the studio, so that, when the full light is turned on to make the photograph, the eyes of the person being photographed suffer no shock, whilst, at the same time, a much greater softness and delicacy is imparted to the modelling of the face than when it is lighted from a non-transparent or solid reflector, such as has always hitherto been used, dispensing with the necessity of having additional lights.

In carrying my invention into practice I cover the light framework of the chamber or reflector with silk gauze, mica, or some such semi-transparent material.

What is claimed is:—In a chamber or reflector for carrying the lamps used in photographing by the electric light, covering the light framework of same with silk gauze, mica, or some other such semi-transparent material.

IMPROVEMENTS IN, OR CONNECTED WITH, PHOTOGRAPHIC EXPOSURE SHUTTERS.

No. 24,910. HERMANN LOUIS CHRISTIAN AUSBUTTEL, Chapel-road, Bexley Heath.—*March* 23, 1895.

MY invention relates to improvements in, or connected with, photographic exposure shutters, and has for its object to provide a shutter which can be used for either time or instantaneous work, while the operating and releasing mechanism is of simple construction, and not liable to get out of order.

In carrying my invention into practical effect I provide a rectangular or other suitably shaped case or frame, within which is mounted two rollers, one at the top and one at the bottom, carrying a blind, having the usual opening, while the lower roller consists of a spring barrel as hitherto. The side of the case is furnished with a small block, to which is attached, by means of screws, or in any other suitable manner, two springs, one on either side. These springs are slightly bent over at the top, so as to engage in certain positions with a pin projecting from one end of the top roller. I likewise provide a short rod, passing through the front of the said frame, the end of which is permanently attached to one of the springs, and always operates

it when the said rod is pushed inwards while it passes through a slot in the second spring, and the rod is at this point provided with a small cross pin, so that in one position of the rod the pin is parallel to the slot, and passes through it without operating the second spring; while in the second position—that is, when the rod is turned partly round, which is effected by means of an arm fixed outside and on the front of the case, the pin is at right angles to the slot, and does not pass through, but causes the second spring to be operated when the rod is pushed in.

My improved shutter operates in the following manner:—

The blind is first set by drawing it round the upper roller by means of a cord wound round one end of the said roller, while, by reason of the spring roller at the bottom of the case to which the other end of the blind is attached, there is a continual pull on the blind tending to pass it from the upper to the lower roller, this being prevented by the pin at the end of the upper roller resting upon the bent-over end of one of the springs. Upon pushing back the spring by means of the rod hereinbefore referred to, the roller is released, thus causing the blind to pass instantly from the upper to the lower roller, the exposure being effected by the opening in the blind passing by the opening in the front of the case, and by this means an instantaneous exposure is effected; if, however, a time exposure is required, the rod is partly revolved by means of the arm outside the frame or case, so as to bring the cross pin at right angles to the aforesaid slot in the second spring, thus causing it to be actuated simultaneously with the first-mentioned spring, so that when the rod is pushed in it allows the top roller to make one revolution, when it is again arrested by the second spring, the opening in the blind being then exactly opposite the opening in the case or frame. When sufficient exposure has been given, the pressure is removed from the rod, which springs back and releases the roller from the second spring, when it makes a second complete revolution and closes the shutter.

The cord for pulling up the blind, and the whole of the mechanism for exposing and altering from instantaneous to time work, and also for winding up or releasing the spring roller, is placed on the front of the case or frame, so that, when used with a hand camera, the latter can be held firmly against the body, and is not as liable to be shaken during exposure as when the said mechanism is placed at the side.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
6	Birmingham Photo. Society	Opening of Tenth Annual Exhibition.
6	Came a Club	Smoking Concert.
6	North Middlesex	Informal Meeting.
6	Peterborough	
6	Putney	
6	Richmond	
6	South London	Sale and Exchange Night.
6	Stereoscopic Club	
7	Birmingham Photo. Society	
7	Bolton Photo. Society	
7	Brixton and Clapham	
7	Exeter	
7	Gospel Oak	Platinotype Demonstration.
7	Hackney	Annual Meeting.
7	Herefordshire	
7	Lewes	
7	North London	
7	Oxford Photo. Society	
7	Paisley	
7	Rochester	
7	Rotherham	
7	Sheffield Photo. Society	
7	York	
8	Croydon Camera Club	Second Annual Rummage Sale.
8	Leytonstone	
8	Munster	
8	Photographic Club	Members' Open Night.
8	Southport	
8	Stockport	
9	Birkenhead Photo. Asso.	
9	Camera Club	*A Tour in Greece and Cyprus, with some Notes on Greek Architecture.* R. Elsey Smith.
9	Cheltenham	
9	Glossop Dale	
9	Hull	
9	Leicester and Leicestershire	
9	London and Provincial	*The Far East.* R. P. Drage.
9	Manchester Photo. Society	
9	Oldham	
9	West London	Annual Exhibition of Members' Work.
10	Bournemouth	Annual General Meeting.
10	Bristol and West of England	
10	Cardiff	
10	Croydon Microscopical	
10	Halifax Camera Club	
10	Holborn	
10	Ireland	*The Hand Camera: Types, Uses, and Work.* Dr. Cosgrave, V. E. Smyth, and F. T. Eason.
10	Maidstone	
11	Hull	
11	Liverpool Amateur	Excursion: Lymm, Cheshire. Leader, James Parkinson.
11	North Middlesex	Excursion: Sewardstone.
11	South London	Exc.: Broxbourne. Leader, W. C. Boyce

PHOTOGRAPHIC CLUB.

APRIL 24,—Mr. Thomas Bedding in the chair.

Mr. MONTAGUE TROUP gave a lantern lecture, entitled, *Snowed up in the Rockies,* illustrated by a large number of slides depicting life in Canada and British Columbia. Railway car life, agriculture, the snow regions, and the rapid growth of the towns in this region of magnificent distances were ably treated by the lecturer in a chatty and instructive fashion.

The CHAIRMAN, in moving a formal vote of thanks to Mr. Troup, said they were all much indebted to the lecturer for his most graphic description of a delightful country. He had proved himself an able geographer and gazetteer, and had set him (the Chairman) longing most ardently to spend the remainder of his days in a country where the fortunate inhabitants have true summer weather for ten months in the year. He would like to be able to avoid February, which appeared to be the "wet month." He would also avoid, if possible, being snowed up sixteen days, as Mr. Troup had been.

The formal vote was carried with extra-special acclamation.

Brixton and Clapham Camera Club.—April 23, Mr. J. W. Coade (Vice-President) in the chair.—The Exhibition Committee presented their report upon the Exhibition recently held, congratulating the Club upon the success which had again attended the undertaking, the favourable notices which it had received in the photographic press, and upon the fact that the receipts had considerably exceeded their expectations. A discussion then followed upon the programme for the summer meetings, and several outings were arranged for. The proceedings were brought to a close with a rummage sale of members' surplus photographic appliances.

Croydon Camera Club.—Between thirty and forty members assembled at the Club rooms on Wednesday, the 24th ult., when Professor CARLTON J. LAMBERT, of the Royal Naval College, gave a masterly and interesting address upon *The Merits of the Welsbach Light for Photographic Use.* The Professor included in his remarks a lucid sketch of the principles governing combustion of gas under various circumstances, explained why the Welsbach light is superior in illuminating power to that of a Bray burner (in the ratio of six to one per cubic foot of gas used), and that, its actinic power being 60 per cent. higher than ordinary gaslight, its photographic value is in ratio of, say, nine to one. An ordinary gas burner (Bray's special No. 5) will give out a candle power of about eleven units; the Welsbach will, for the same consumption of gas, produce about seventy-six units, which, for photographic purposes, will be equal to about 114 units, compared with the eleven of the Bray burner. An interesting explanation of how the mantle is made of knitted wool, steeped in thoria; the wool is then burnt, the mantle being thus composed of a skeleton formed of thoria; and a series of proofs of the complete freeness of the light from acetylene, and from C.O., concluded a well-listened-to lecture. At the instance of the President, seconded by Mr. Packham, a cordial vote of thanks was given. Some considerable discussion regarding the photographic advantages of the light was initiated by Mr. G. R. White, and taken part in by Professor Lambert, and Messrs. Maclean, Hirst, J. Smith, Packham, Isaac, and others. Several portraits were taken after the lecture by means of an installation fitted up by Mr. D. Waller; Messrs. G. Corden, A. Jenkins, G. R. White, and J. Smith practically testing the light. The latter, working at *f*-8, in five seconds, on a "lightning" plate, obtained a fully exposed head and bust. Mr. Corden also met with a complete success with ten seconds' exposure. Later in the evening Mr. Smith took two groups of members by means of a "flashlight." Messrs. Claude J. Packham, G. H. Gardiner, and W. H. Rogers were elected members.

Putney Photographic Society.—April 25, Mr. L. S. Zachariasen in the chair.—An interesting paper was read by Mr. EUSTACE CALLAND on *The Camera in the Country.* Mr. Calland opened his subject with a plea for serious work. He did not wish to disparage the use of the camera for making souvenirs of travels and visits, but imagined that the members of this Society had got beyond that point. He briefly referred to those branches of science which could receive valuable aid from the photographer whose occupations only permitted an occasional visit to the country, and mentioned treatises in which the photographic assistance of natural history—including botany, geology, and meteorology—were set forth in detail. He commented on the value of photography as an educational factor, in records of village industries, in making photographic surveys, and in the illustration of books devoted to various sciences and of travel. Coming to those who felt greater pleasure in the making of pictures than in the service of science, it was pointed out that the best work could rarely be accomplished in the usual Society's outings, and that the production of photographs which reached an artistic standard that a few years back was considered a very high one, was now so numerous that, unless a subject had very distinct qualities which strongly appealed to us, it was scarcely worth doing. Some of the qualities to be sought for were touched upon, and the influence of modern painting on photography, and *vice versâ,* was referred to. It was desirable that colour should be rendered (in purely pictorial photography) in accordance with the mental image conceived of it in monochrome. Some examples of improved colour-rendering by Lumière plates, lent by Messrs. Fuerst, and a portable spectroscope, lent by Messrs. Steward, were shown as aids in this still uncertain domain of photography.

Woodford Photographic Society.—April 25, Mr. Wilmer in the chair.—An interesting discussion took place upon colour screens, Mr. Marriage showing one of his own construction made with stained collodion. It was constructed with the view of giving ample exposure to the foreground, at the same time securing any clouds that may be present. Mr. EMLER then read a paper on toning printing-out paper. The rationale of the toning process was gone into, various examples of toning were shown, formulæ of baths given and the importance of thorough washing and fixing were dealt with—in fact, the whole field was well covered. An interesting discussion followed.

Bradford Photographic Society.—The first *conversazione* and exhibition in connexion with this Society was held on April 25, at the Club-rooms,

Sunbridge-road. The rooms were tastefully decorated with members' work, foremost of which were the work of the President, Mr. Alex. Keighley, the most noticeable being *An Alpine Cross* and *Springtime*. Mr. P. R. Salmon showed a fine series of figure studies, *Cinderella*, a charming rendering of the well-known story, and his other pictures, *At the Well*, *Forty Winks*, &c., came in for a good share of admiration. Mr. O. Nicholson exhibited a fine series of half-plates upon gelatino-chloride paper; these were remarkable specimens of good technical workmanship. Mr. F. Fearnside was represented by some fine platinotypes. Messrs. F. Nicholson, F. Sowden, W. Booth, and J. Snowden also showed good work. The editor of the *Practical Photographer* lent many interesting objects, consisting of pictures, rare publications, stereoscopes, albums, &c. A large number of slides were passed through the lantern by Messrs. Appleton and Harmsworth; these consisted of—Ingleton scenery, F. Sowden; Lake district to Ingleton, F. Fearnside; Cambridge Colleges and Isle of Wight, P. R. Salmon; Blythe, O. Nicholson; Bolton, J. Judson; a fine series by Mr. Wood and many others. Dancing was then indulged in till the early hours of the morning, the intervals between being given up to songs, recitations, &c. The whole affair was highly successful, and the evening was voted most enjoyable on all sides. The energetic Secretary and Committee deserve great praise for the satisfactory manner in which they carried out the arrangements.

King's Norton.—April 24.—A lecture, arranged by Messrs. C. Grimley and D. Cotes-Preedy, was given in the Board Schools by Mr. HAROLD BAKER, of Birmingham, entitled, *The Valley of the Avon*. The lecture, which was very interesting to the hearers on account of the localities mentioned, was illustrated with slides taken by the lecturer.

Leeds Camera Club.—April 25, Annual General Meeting.—The following officers were elected without contest:—*President:* Dr. J. T. Thresh, M.A.—*Vice-Presidents:* Major Norwood, Councillor J. Green-Hirst, Rev. J. Beanland, Mr. A. Homburg, and Mr. W. R. Irwin.—*Treasurer:* Mr. T. R. Thompson.—*Lanternist:* Mr. A. Oddy.—*Secretaries:* Messrs. H. F. Wigglesworth and S. Barnes. For the Committee, for which seven are required, some twenty-five nominations had been received, and of these, fourteen members elected to go to the poll, which resulted in the election of the following gentlemen:—Messrs. C. C. Vevers, G. Dixon, W. A. Daniel, A. Oddy, G. Wright, W. Hesling, and C. B. Hutchinson. Messrs. C. B. Hutchinson and E. C. Oddy tied for seventh place, which, on a second vote, was secured by Mr. Hutchinson (the retiring Secretary) by fourteen votes to twelve. It was resolved that a club library should be formed, and several volumes of photographic literature were promised by members present as a nucleus. It was also decided to hold club excursions during the summer months on the second Wednesday and last Saturday in each month to various places of photographic interest, to be announced later. A vote of thanks to the retiring Committee for their arduous duties efficiently carried out during the past session, proposed by Councillor Hirst, terminated the meeting. All communications respecting Club matters should in future be addressed to Mr. H. F. Wrigglesworth, Primrose Cottage, Armley, or to Mr. S. Barnes, Ladylane, Leeds, the joint Hon. Secretaries.

Liverpool Amateur Photographic Association.—April 25, Mr. Geo. B. Newton, the President, in the Chair.—Messrs. R. S. Smith and Fred. W. Barritt were elected members of the Association. The feature of the evening was a lecture by Mr. F. O. Bynoe, of London, on the *Modern Hand Camera and its Capabilities*. The lecturer recommended the use of cut celluloid films in place of glass plates for hand cameras, and pointed out how the production of a satisfactory device for automatically changing cut films without sheaths had long puzzled inventors. He then described with diagrams and mechanical slides the "Frena" system for changing the films, which was, he believed, the only satisfactory method, and one which had stood the ordeal of practice. The fixed-focus lens was, he maintained, the best for hand cameras, as the instrument should be ready for use at any moment. A number of excellent slides from negatives taken with the "Frena" were exhibited. Afterwards, Mr. F. A. Schierwater (a member) exhibited and explained a very ingenious washing rack for films which he had invented.

Plymouth Photographic Society.—On Friday evening the closing meeting was held at the Mechanic's Institute, Plymouth, when there was an Exhibition of member's slides. These were put through the lantern by the Hon. Secretary, Mr. R. Rugg Monk. Considering that the Society has only been in existence three months, the work was of a very satisfactory character. Plans for summer outings were formulated, and for an Exhibition in the autumn.

The New Glasgow Photographic Club.—The opening *conversazione* of the *Evening Times* Camera Club took place in the rooms at 46, Gordon-street, on Wednesday, April 24. There was a very large attendance, the chief room, which accommodates upwards of 200, being crowded. On the walls there were a number of exhibits, and the leading dealers in the city sent selections of material. Bailie Primrose took the chair, and among the other gentlemen present were:—Councillor Alexander Sinclair, Mr. William Wallace, Mr. M. Graham, Mr. A. H. Duncan, Mr. J. Craig Annan, Mr. W. M. Warneuke, Mr. William Goodwin, Mr. J. Stuart, Mr. A. Lindsay Miller, Mr. George Mason, Mr. J. Lizars, and Mr. A. Cowie. The HON. SECRETARY (Mr. H. C. Shelley) stated that, at the request of the Committee, he had asked the different Photographic Societies in the West of Scotland to send representatives. An invitation had also been sent to Edinburgh, but their friends there said they regretted that the time at the disposal of the Committee did not permit them to elect a qualified representative. The West of Scotland Amateur Photographic Society sent Mr. William Goodwin, the Secretary; the Glasgow Photographic Association, Mr. John Stuart, the President; the Monklands Photographic Association, Mr. J. W. Eadie; the Falkirk Amateur Photographic Association, Mr. John Higgins; and the Kilmarnock and Ayrshire Association, Mr. Ferguson. Mr. Shelley, continuing, said that about two years ago the idea occurred to him, being an amateur photographer, that one of the evening newspapers of Glasgow might do worse than devote a column to amateur photographic notes. He placed the matter before the proprietors of the *Evening Times*, and he little thought that that successful meeting would be the result. When he asked for suggestions as to what should be done to improve the column which was started, two or three gentlemen wrote at once that a camera club should be formed. The suggestion was enthusiastically adopted and carried out. The newly established organization had been exceedingly fortunate in being able to secure good rooms, fortunate in the energetic committee which had been elected, fortunate in finding a gentleman like Mr. Bennett, who had shown great interest in the fitting up of the rooms, fortunate in their connexion with the *Evening Times*, and fortunate in having such a distinguished amateur as Bailie Primrose to preside at the opening *conversazione*. They had also been fortunate in being the recipients of gifts in the shape of a limelight lantern and an enlarging apparatus. Bailie PRIMROSE, in declaring the rooms open, said he esteemed it a high honour to take part in the ceremony of opening the rooms of a Club which was formed to further a pursuit that had given him so much delight. For two years he had read with great interest the notes pertaining to photography which had appeared in the *Evening Times*, and he rejoiced that, as the outcome of those jottings, the Camera Club had been started. He did not know that an association could be established in connexion with an occupation more entrancing and more delightful. As every one of them had an inner chamber of imagery, into which he retired and viewed those creations which imagination had set up, so, in the practice of photography, in a more material sense, they filled other chambers with those beautiful reproductions of the camera, those transcripts from nature which they at leisure contemplated, and in the contemplation of which they derived much which was stimulating and elevating. Having referred to the artistic training which was involved in selecting a nicely composed picture, and the manipulation which was required to give an adequate rendering of it, Bailie Primrose said that photography was a pastime which tended to educate and school one in the perception of what was beautiful, attractive, and delightful in nature. Speaking for himself, he could say that the appreciation of the works of artists had been greatly increased and strengthened in him by the exercise he had had in attempting to compose pictures. He was sure that every one who took up photography would find that, within its limitations, there was embraced a variety of interest which was charming, and gave to the operator a never-ceasing pleasure. If he might venture to address a word of advice to the amateur, he would say to him that he could not hope to compete in portraiture with his professional brother with all the adventitious aids which he had at his command. He would therefore wisely devote himself to the taking of other pictures. Councillor SINCLAIR said that the Club had one of the most promising and artistic, and at the same time practical, objects in view of perhaps any Club in the city. While the members might go far afield in search of subjects to photograph, they would find near home others which were equally worthy of their attention. He could not imagine a more interesting occupation for them than to preserve in enduring form many of those features of the city and neighbourhood which were rapidly passing away in consequence of the march of progress. Mr. WALLACE proposed a vote of thanks to Bailie Primrose for presiding. Mr. A. H. DUNCAN, in seconding, mentioned that the membership was over 200. Thereafter, lantern slides were shown by Messrs. A. Lindsay Miller, Robert Burnie, D. R. Macdonald, J. C. Oliver, E. F. Archibald, and Dr. J. A. Wilson.

FORTHCOMING EXHIBITIONS.

1895.		
May 3, 4	*Eastbourne.	J. J. Hollway, 11, Hyde-gardens, Eastbourne.
,, 6–11	*Birmingham.	C. J. Fowler, 2, High-street, Birmingham.
June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

News and Notes.

PHOTO-CERAMIC ENAMELS.—On Friday last week a demonstration of enamels and the art of their production was given by Mr. Ethelbert Henry, C.E., in the Photogram Reading-room. It was highly successful and quite a number attended. The exhibition embraced many ceramics by ten or twelve makers.

FORMALIN.—Messrs. Fuerst Brothers, 17, Philpot-lane, E.C., with reference to our article last week on formalin, point out that they have been supplying this article for some time at 2*s.* 6*d.* per pound, which is about thirty-three per cent. cheaper than the price we mentioned as having been paid by us for it, while for large quantities it is even considerably less.

THE CAMERA CLUB ALBUM OR INTERCHANGEABLE SCRAP.—In our notice of this album Messrs. Marcus Ward & Co. inform us that "it fails to bring forward one of the most important points in connexion with the book, viz., the cut-out opening at the foot of each photograph for the title to be inserted (see illustration). The openings are not solely for the object of inserting the photographs, though, in the case of half-plate and quarter-plate, they can be used for this purpose. The usual manner of inserting is from the edge, which is left open. Another point is that you refer to their being for quarter-plate prints, whereas, as you will see from the list we send you, the books are done for quarter, half, and whole-plate." We give this correction with pleasure.

Exchange Column.

Wanted Optimus Camera Cabinet embossing press, with three or more dies for cabinets, in exchange for pair of Lancaster's stereo narrow-angle lenses; new.—Address, W. BOND, 1 Sprowston-road, Norwich.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PLATE-PACKING.

To the EDITOR.

SIR,—There is no doubt that plate-makers adopted their various methods of procedure after careful consideration on all sides, and that they are ready to change if they can be shown a better way.

Placing the plates face to face, without anything intervening, is certainly, as your esteemed contributor, "Cosmos," puts it, "an ideal method of packing," but it requires perfection all round.

Occasionally the plates get abraded from the want of perfect flatness in the glass employed. Not *every* piece is free from a slight projection, and, when folded and pressed together, makes a hole in the opposite film.

Next they must be cut face downwards. Is there *never* a particle of glass or grit underneath? Appearances *sometimes* point that way, although, I am happy to say, but very seldom. The wonder is the defects are so few and far between. Our thanks as users are certainly due to them for giving us such excellent ones to work with.

In my opinion, a small strip of thick paper placed between the edges, preferably at the sides, is the better plan for use. Either way the plates keep well, the small amount of air enclosed being no detriment. Sometimes an uneven number is taken from a packet, with paper at the edges; the odd one left can be turned over, or covered with a waste plate, for the protection of the film.—I am, yours, &c., W. G.

ACETATE TONING.

To the EDITOR.

SIR,—As I have had a deal of trouble of late with my toning bath, which I make of acetate of soda, I should be very much obliged if you could tell me what is the matter, and give me a good reliable receipt for mixing one up. Mine never acts the same.—I am, yours, &c.,

TONING.

[See leader on this subject.—ED.]

THE CHEMISTRY OF "COSMOS."

To the EDITOR.

SIR,—I was very glad to see the table of "Equivalence of the Alkalies" in this week's issue, but is there not some mistake in it? It gives one part of carbonate of soda as equivalent to 1·301 parts of carbonate of potash; if that is true, then 1·927 parts of the former cannot be equal to the same number of parts (1·927) of the latter, nor 2·650 = 2·650.—I am, yours, &c., JOHN ELLIOTT.

4, *The Beacon, Exmouth, April* 26, 1895.

To the EDITOR.

SIR,—Kindly get "Cosmos" to revise his table of equivalence of alkalies, published in to-day's BRITISH JOURNAL OF PHOTOGRAPHY. You will find that in the first two lines of figures carb. of soda and carb. of potash are supposed to equal one another; in the remaining four lines the carb. of potash is represented as being stronger than the carb. of soda, and it is a pity that a useful table such as this is not given correctly. What is the use of the last line of the table?—I am, yours, &c., J.

To the EDITOR.

SIR,—If your contributor, "Cosmos," will read over his table, as printed, he will see that it needs considerable revision. For instance, in lines one and two soda and potash carbonate are treated as equal, but cease to be so in the following lines. The top line for potash should read 3·46. In line five, 0·352 should be 2·352. It is not stated what soda carbonate is meant.—I am, yours, &c., CLIFFORD E. F. NASH.

SUGGESTIONS IN CONNEXION WITH GELATINO-CHLORIDE PAPERS.

To the EDITOR.

SIR,—With reference to the letter written by Messrs. Wellington & Ward in your last issue, I venture, as an amateur who does a great deal more than the average amount of quarter-plate work, to make a further suggestion.

My experience is that it is almost impossible to get a print 4 × 3 from a quarter-plate negative, but that in every case you can cut 3⅞ × 2⅞. I may be told that I ought to be able to do so, but I venture to say that my experience is the same as that of nearly all quarter-plate workers, viz., that theoretically you ought, but practically you can't.

There is another point I feel bound to allude to. Nearly, if not all, the paper-makers are sending out a special cabinet size 6 × 4¼, twenty-four sheets in the shilling packet, thus giving forty-eight pieces 4¼ × 3; Messrs. Wellington & Ward advertise only forty-two pieces 4 × 3 for a shilling. In that case, as they both want trimming, I think the inference is obvious, especially as one sheet 24¼ × 17 cuts easily into thirty-two pieces 4¼ × 3.—I am, yours, &c., QUARTER-PLATE.

April 29, 1895.

SIZES OF PAPER.

To the EDITOR.

SIR,—I wish that those who desire to use sizes other than those usually made, would confine themselves to advocating their introduction, without trying to injure those who would greatly regret the loss of the sizes to which they are accustomed. I feel sure that most people would prefer, for instance, the usual 4¼ × 3¼ to the proposed 3 × 4. There is always some trimming required after washing, and, besides this, if great exactness were not used in laying the smaller paper on the negative, the necessary cutting to get the picture straight would diminish the size very materially.—I am, yours, &c., CLIFFORD E. F. NASH.

DECOMPOSITIONS OF SODIUM THIOSULPHATE IN THE FIXING BATH.

To the EDITOR.

SIR,—Will you allow me to point out that the paper of Messrs. Seyewetz and Chicandard, published in your issue of the 19th inst., and referred to in a leader on the 26th inst., is very largely hypothetical, and contains little or no account of the experimental evidence on which the conclusions are based. It not only assumes the formation of compounds, the existence of which (*e.g.*, aluminium thiosulphate) is extremely doubtful, but some at least of the conclusions are at variance with those previously arrived at by careful workers (compare, for example, Colefax, *Journal of the Chemical Society*, 1892).

I would suggest, therefore, to your readers the advisability of waiting for further *experimental proofs* before unreservedly assuming that Messrs. Seyewetz and Chicandard's ingenious and interesting equations really represent the changes that take place in an acidified fixing bath.—I am, yours, &c., C. H. BOTHAMLEY.

Taunton, April 29, 1895.

THE ALLEGED PLAGIARISM.

To the EDITOR.

SIR,—Mr. Harding, instead of apologising for the very grave charge which he has thought fit to bring with such publicity against me, now entirely shifts his ground and makes an entirely new accusation, alleging that, if not inspired by "Snapshot Photography" he "has not the slightest doubt that a series of articles written by himself in the *Hand Camera and Lantern Review* were the source of my inspiration." That there is a similarity in the paragraphs which Mr. Harding contrasts cannot be denied, but no more, I venture to think, than one would expect to find with any two men writing on the same subject. As your esteemed contributor, "Cosmos," very truly says, "There is no novelty of principle or idea contained in the advice to adopt small work with a view to subsequent enlargement," and, for my part, I certainly should disclaim any originality of principle in the procedure I ventured to recommend. I do, however, emphatically deny that I am indebted to Mr. Harding either for the principle or its application. It is idle to bandy words with such as he, nor will I do so further than to state that I did not know, previously to reading his letter, that he had written the articles he refers to in the journal he names, and that, therefore, I have never read a single line of them.—I am, yours, &c.,

87, *Chancery-lane, April* 29, 1895. JOHN A. HODGES.

To the EDITOR.

SIR,—I am sorry to find that Mr. M. J. Harding, instead of seeing his way to withdraw his charge against Mr. Hodges, has apparently gone out of his way to repeat it.

Mr. Harding appears to be too sensitive.

I bought his little book a few weeks ago, and whilst I find it interesting, I did not find much that appeared to be original.

On referring to a volume of the *Illustrated Photographer*, dated 1868, I find the late Thomas Sutton and others discussing the merits of small cameras, and I fear it would be easy to collate passages from that volume and Mr. Harding's little book that would look very much alike. But I

regard Mr. Harding as a gentleman, and I refuse lightly to think that he would plagiarise.

And regarding Mr. Hodges also as a gentleman, I refuse to think this also of him. Finally, I hope that you, sir, will not allow this squabble to occupy much space in your columns.—I am, yours, &c.,

April 29, 1895. AN OLD PHOTOGRAPHER.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—One who has been assisted by this Association writes me as follows:—

"I should like to take exception to what I think was an unjust and uncalled-for assertion in your communication to last week's JOURNAL, viz.:—'That those who appeal to the Benevolent are the less competent.' Now, I believe there are not many operators still in harness who have had a much longer or more varied experience than I have had; and, at the risk of appearing egotistical, I must say that I would give way to no man in anything I undertook to do until he had proved himself to be the better, and I have plenty of testimonials to bear me out. Being, then, unfortunately one of those who have received aid from the Benevolent, I do think it hard, and others may share the feeling with me, that such an assertion should be publicly made when it cannot be challenged without making public one's own humiliation."

I should be sorry indeed to in any way hurt the feelings or be unjust to those who have been assisted by the Benevolent Association. The sentence to which this correspondent objects seems to bear on its face the construction that those who appeal to the Benevolent are the less competent "commercially." Even if it was read in the other sense, I think the statement would be equally true of the bulk of the applicants, in spite of the fact that there are some whose work is undoubtedly good and whose photographic competence is unquestionable.

While upon this subject, may I point out the fact, to which I should not otherwise have drawn attention, that the seventh word of the second paragraph of my letter in your issue of the 19th obviously should be "benefit" instead of "benevolent."—I am, yours, &c.,

H. SNOWDEN WARD.

The Photographers' Benevolent Association,
6, Farringdon-avenue, London, E.C., April 25, 1895.

To the EDITOR.

SIR,—Unless an effort be made by photographic assistants, the Photographers' Benevolent Association must cease to exist. In order that this event may be avoided, I venture to ask you to kindly allow me the privilege, you so kindly accorded twenty-two years ago, when the Association was started, of using your columns for the purpose of calling upon photographic assistants in London to meet me at the White Swan Hotel, Tudor-street, Whitefriars, on Tuesday evening next, May 7, at 8 o'clock, to consider the matter.—I am, yours, &c.,

W. T. WILKINSON,
One of the original founders of the Association.

A LUCRATIVE APPOINTMENT.

To the EDITOR.

SIR,—Although I consider "Drop Shutter's" letter a piece of gross impertinence, still his curiosity shall be gratified.

The number of applications I had for the post in question—personal and by letter—was thirty-one. Many had references of over twelve years, two over seventeen years.

Of course, I do not know who "Drop Shutter" is, but, from his *nom-de-plume*, I should imagine he was a new hand. However, he can take it as a fact that I had the pick of some good men, and they knew the wage offered, &c., is *quite* as good as 1*l.* 10*s.* per week. Does "Drop Shutter" get as much?—I am, yours, &c.,

STUART LANCASTER, *Art Photographer to the Queen.*
Chatham Intra, Rochester, April 30, 1895.

A HARD CASE.

To the EDITOR.

SIR,—*Re* "Printer's" letter, "A Hard Case," which I read in THE BRITISH JOURNAL OF PHOTOGRAPHY for March 20, how will the following description of my present position as operator and retoucher for a certain cheap firm in the East End of London suit the ideas of "A Hard Case?"

Business commences at this establishment at half-past nine. I have to retouch thirty negatives by one o'clock; I am then supposed to go to dinner, for which I am allowed three-quarters of an hour, sometimes less. Thirty more negatives to be retouched by five o'clock; thirty minutes for tea. Between half-past five and half-past nine o'clock is occupied with developing, sensitising, and filling in, press ready for the next day's printing.

This is the regular routine from Monday till Saturday night. But what about Sunday? It is something grand to look forward to. I look upon it as a day of rest, but there is just a little operating to do which amounts to about sixty sitters of the match factory stamp. Sundays, eleven till five, return at six o'clock to develop the above, which takes till half-past eight. I am then at liberty to enjoy a quiet Sabbath evening, but, unfortunately, feel more fit for bed than pleasure.

I am given to understand that my predecessor, who held this lucrative appointment, was removed to a private lunatic asylum, he having actually had the atrocious impertinence to ask for a day off to bury his mother.—I am, yours, &c., A VICTIM OF CIRCUMSTANCES.

To the EDITOR.

SIR,—As only ten assistants have written to me in answer to the appeal I made to promote a Guild or Society to watch the interests of Photographic Assistants, I presume there is no urgent demand for such a Society. However, if you think the details of such a scheme would prove of interest to your readers, I enclose the same. I desire to thank you, Sir, for the sympathy you have shown towards me, and the readiness with which you gave publicity to the matters I brought before you.—I am, yours, &c. JOHN A. RANDALL.

118, *Cregoe-street, Birmingham, April* 21, 1895.

GUILD OF PHOTOGRAPHY.

FRIENDS,—I take this opportunity of calling your attention to matters which have great influence upon the well-being and working conditions of all Photographic Assistants, and are also of more than passing importance to any worker in Photography, however high his position, so long as that position depends upon the will of another. An assistant may be deprived, at a moment's notice, not only of his means of livelihood, but what is of greater value, a good character, at the mere arbitrary will of a callous and unjust employer. At present, however hard the injustice an assistant has to suffer, he has absolutely no remedy, no society or body of men to whom he can apply for guidance and assistance to vindicate his rights. Neither has he any certain means of giving publicity to unfair treatment, the trade journals being, to some extent, debarred from giving free expression to opinion. Many of the abuses from which Photographic Assistants suffer are not actionable at law, and can only be remedied by the force of public opinion and the moral censure of all fair and upright men. Others are legally wrong, and by taking proper action redress could be obtained in the law courts of the country. What Photographic Assistants need is, first, a body of men to represent them; and, secondly, a medium to give voice to their just claims. These considerations were lately forced upon me by the exactions of an employer, and I was requested to give publicity to these objectionable proceedings. I took the only available method, and appealed to the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, who readily published a letter in the issue of 29th March, 1895.

The publication of this letter was helpful so far as it went, but the firms' identity was hidden, and their grossly unfair conduct was not brought home to them. Moreover, my power of action was exhausted, and I could do nothing more. It is evident, therefore, that if anything is to result, and grievances are to be remedied, some other method must be found to bring more pressure to bear upon offenders. Now, the only way by which this is possible is a combination amongst Assistants, that by general action a forcible protest may be made. Hence I most earnestly ask every Photographic Assistant to pledge himself to do his utmost to aid in bringing about this common action. A single protest here and there is futile. If evils in the photographic trade are to be abolished, there must be a unanimous voice and unwavering front.

Having your support, with a majority of Assistants combined to help each other in difficulties, it becomes comparatively easy to form a plan of action, and to take proceedings for the mutual advantage of the members of such combination.

I propose that the Society be called the Guild of Photography. 1. A Public Meeting to be called, the first proceeding to appoint as Chairman and Treasurer some well-known, reliable, and trustworthy man, who is in full sympathy with the Guild. 2. A Committee to be formed, to meet in London, or some other centre. 3. To appoint a Representative of the Guild in every district of the kingdom. 4. The Guild to publish weekly, or monthly, as funds permit, a Journal exclusively devoted to the interests and affairs of its members. 5. To amalgamate with the Photographers' Benevolent Association. If this cannot be done, to work in union with the Association. 6. To endeavour to establish a Sick Benefit, Pension, Out-of-work, and Loan scheme connected with the Guild. 7. To hold an Annual Conference, Exhibition, &c., devoted to the work of members and the business of the Guild.

Such are the main proposals I wish to bring to your notice. The chief work of the Guild would come within these bounds. The business of the Committee would consist in undertaking (1) A Labour Bureau, with the publication in the Guild paper of situations vacant and wanted for the use of members. To investigate cases of Wrongful Dismissal, Breach of Contract, &c., with a view to taking legal action. (3) Giving publicity to cases of Sweating, Long Hours, Excessive Fines, &c. (4) To take means of regaining possession of Specimens wrongfully detained. Such recovery would be greatly facilitated by the Guild's representative in the neighbourhood making a personal application. (5) To induce photographers to concede a Weekly Half-holiday, more especially in the case of Operators, Retouchers, who suffer ill-health by continuous application to a sedentary occupation. (6) To impress upon employers the necessity of building large and commodious Dark Rooms and Workshops. To build them of the cubic dimensions demanded from those under the Factory Acts. (7) To take means of obtaining proper Sanitary Arrangements, particularly in places where a large number of hands are employed. (8) To gain from reliable sources, and put on record, for the convenience of members of the Guild, the identity of those who engage assistants under false pretences, *i.e.*, promising permanent work and dismissing at end of season;

representing their work and style as first-class when it is plainly inferior; inducing assistants to travel long distances with no intention of paying the railway fare incurred. Those who engage Female Assistants with questionable intentions. 'A most shocking example of this offence came under my personal notice.' Those who persistently acquire specimens and refuse to return them. Those who are constantly changing their employees, and who dismiss them for the most trivial offences. (9) To make the Guild Journal as useful and beneficial to the members as possible.

The foregoing is briefly what I propose, and such a scheme could be started at once. To some it may appear inadequate, and not comprehensive enough; but it must be remembered that we have to break entirely new ground, and it would be useless to attempt tasks beyond our strength. The scheme need be only preliminary to future developments; it might become a Trade Union, Benefit Society, or become a Social, Recreative, and Educational body. I should like to see prominence given to the social side of the Guild, in order to bring Photographers more together, and increase the spirit of fellowship and co-operation.

Should this scheme commend itself to you, I trust you will give the utmost of your support. Its success will depend entirely upon the hearty co-operation of its individual members, and the financial support they are prepared to give. A few pence a week from the majority of Photographic Assistants would accomplish much, but many benefits could not be given under sixpence or so per week. This is not a great sum to sacrifice for the prosperity and well-doing of a Worker's own Craft. It is in your interest, and in the interest of the whole photographic class that this appeal is made. Should it succeed, you will reap the full benefit of that success, and share in the honour of having done your best to raise the status of the Photographic Worker, and indirectly the whole Photographic Trade. I have no doubt many employers would give their help to the Guild and become valuable members. I detest everything that savours of coercion—the spirit which says "You shall!" I would rather work in the spirit of "We will." Perhaps you would approach your employer in the same spirit, and endeavour to obtain his aid.

Kindly let me know how far you are prepared to help on this work, also in what branch of the trade you are employed. If sufficient members are enrolled a complete Working Plan will be formed by general consent, Rules, Regulations, Subscriptions, &c., will then be issued. I shall be pleased to receive any suggestions you can make to increase the usefulness and efficiency of this Guild.

JOHN A. RANDALL.

118 *Cregoe-street, Birmingham, April* 20, 1895.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

J.—We cannot at present give the rule for combining the lenses.

AN OLD SUBSCRIBER.—The police will help, rather than interfere with you.

RECEIVED.—Marion & Co.: *Process Work Year-book; Penrose's Annual for* 1895. Imperial Dry Plate Co. Next week.

M. B. C.—You might try such houses as Mr. Chatham Pexton, York & Son, Newton & Co. These are all London houses.

KINTYRE.—Any toning bath may be used for toning prints for "crystoleum." Ordinary albumenised paper is what is generally employed for prints for that process.

C. A. S.—Messrs. Hetley & Co., Soho-square, used to supply optical glass, but whether they do so now we are not aware. They do not, however, we imagine, supply glass of the Jena make.

S.B.E.—The combined bath may be used for albumen paper, but it is no more to be recommended for that than it is for gelatino-chloride papers. The only objection to its employment is on the ground of instability.

ENLARGER (Brighton).—The cause of your failure all throughout is in your having omitted to add glacial acetic acid to the silver bath for sensitising the paper. Begin by adding not less than five minims per ounce of silver solution, and increase the proportion, if necessary, until you get perfect brightness and vigour.

J. W. HEAWOOD says: "Would you be so good as to oblige me with a practical formula for wood-block printing? What I mean is to prepare a boxwood block for the engraver to work upon without having any film which is apt to peel up in working."—In reply: See the JOURNAL for April 8, 1892, in which such a process is fully described.

W. J. BRIGHT asks: "1. Can you give me an address of a genuine firm of photographic dealers who cater for the trade? 2. Should be pleased to know the full address of Messrs. De Gruchy & Co., London, mount manufacturers."—In reply: 1. All firms of photographic dealers are, so far as we know, genuine. 2. The address is, or was, Lambeth-hill, Queen Victoria-street, E.C.

BUCKS.—There is no means of knowing for certain whether the photographs are copyright or not by application at Stationers' Hall, inasmuch as it is not necessary that photographs which are published and obtain copyright abroad should be registered here. There is very little doubt, however, that the photographs are copyright, and if they are copied you will have to take the risk of an action at law.

WARDER.—We fear there is no compensation to be obtained. As the parcel was signed for, that is taken, in a measure, to imply that it was received in good condition, and as the damage was not discovered when the box was opened a week or ten days afterwards, it is not surprising that the company deny liability. We doubt very much, if you will, under the circumstances, be successful in a County Court suit.

A. BOYCE.—If the chloride of gold, directly it was dissolved, caused a discolouration of the water, and soon caused a precipitate to form, it is quite clear that the water, though distilled, was impure, that is, of course, assuming that the vessel in which the solution was made was perfectly clean. If that was not the case the result is quite what might have been expected, even if the water was without contamination.

T. B.—Under the circumstances we very much doubt if you have a legal copyright in the photograph, and for that reason we should not advise you to institute proceedings against the paper—though it is a mean thing, but not an exception with some of the illustrated press. The reason why the photograph is not legally copyright is that the view and group was taken by your *employé*, and registered in your name as being the author. A similar case, Nottage *v.* Jackson, was decided some years ago in favour of the defendant.

W. GIRLING says: "Last week I had an unfortunate experience: a negative dried unevenly, showing dark places when printed from. I soaked it for three days to get the film to an even, homogeneous condition, but without avail. Can you please say in your 'Answers to Correspondents' whether you know any means that will restore it? It is one taken when out on Easter Monday for a trip, and cannot be easily repeated."—If the treatment adopted does not answer, we fear no other will.

A. SWAN WATSON says: "I should be very much indebted to you if you would give me your opinion as to the cause of bronzing in silver prints. For some time past I have been much troubled with it. I have never experienced it before. The bath is, as usual, forty-eight grains, and the time of floating three minutes. I send you three prints to show you."—The bronzing can be avoided by diluting the silver bath; but we should have thought that the strength of the bath mentioned, with commercial albumenised paper, would not give excessive bronzing. Is it not stronger than that?

JOHN COOKE writes: "1. The enclosed albumenised piece of paper is my first attempt. Do you think it has got sufficient gloss on it before I sensitise it? How long will albumenised paper keep good? 2. I have tested some distilled water with nitrate of baryta, and it turns it quite cloudy. Will it be safe to use it for bromide emulsion? If not, how can I purify the water?"—1. No specimen of the paper was enclosed. Albumenised paper, if kept dry, will keep good for years. 2. Without knowing what the impurity is, we cannot say. Better get other water than attempt to purify impure.

A. H. HARVEY.—You cannot prevent your neighbour from extending his premises, even if it does stop off all the side light from your studio. He has a perfect right to erect anything he likes on his own property so far as his neighbours are concerned. The fact that your studio was erected before his new building was commenced is of no moment. If the studio had been in its present position for twenty years, you would then be entitled to "ancient lights." Then you could have prevented the new building being put up if it interfered with your light unless you were compensated for the injury sustained. As it is, you can do nothing, and the advice your solicitor has given is correct enough, without doubt.

KODET writes: "Will you please assist in regard to following. My place of residence adjoins my business premises. The air seems charged with fine dust to such an extent that, however careful I have been, so soon as I place a batch of P.O.P. prints in washer, they become covered with minute black specks, which are so imbedded in the gelatine as to spoil the prints. The trouble is not with water, as I have strained muslin over supply. Can you suggest any remedy? Do you think I should have better success with any other printing process, or what would you recommend?"—We fancy the spots must proceed from some other cause than dust. We should advise that the prints be carefully dusted before they are put into the water, and, supposing the water be from the usual town supply, there ought to be no spots. If the spots are still present, we should recommend another kind of paper to be used. Try albumenised.

P. O. P. OPALINE writes: "I should be very thankful if you would give me your advice on the following. 1. I use Ilford P.O.P. exclusively for my view trade, and I find on squeegeeing the prints—which I first dry after the first wash—on to the apparently clean opalines with gilt borders, that after a time the prints strip off as if the glass had been previously talced. I have tried a solution of nitric acid in water to clean the glass, but find it injures the gilt borders. Can you suggest anything? 2. After fixing the print in contact with the opaline, I back them with waterproof backing paper. Would it be advisable to allow the print to quite dry before backing it, and would it not be better to allow the backing to dry before mounting on to the plush block?"—1. The best way to get over the difficulty will be to mount the wet prints on the glass with a weak solution of gelatine. 2. Some work one way and some the other. We prefer to let the print dry first.

CONTENTS.

	Page
A NEW STEREOSCOPIC ATTACHMENT TO THE CAMERA	273
THE FIXING BATH FOR POSITIVE PRINTS	274
CHLORIDE OF GOLD AND THE ACETATE TONING BATH	275
THE COMPARATIVE DEVELOPING VALUES OF THE ALKALIES. By W. B. BOLTON	277
PHOTOGRAPHIC CRITICS CRITICISED. By THOMAS BEDDING	278
SOFTNESS OF DEFINITION. By J. K. TULLOCH, M.B.	280
THE EXAMINATION OF PHOTOGRAPHIC LENSES. By J. R. GOTZ	281
THE AMMONIUM CARBONATE DEVELOPER.—II. By MATTHEW WILSON	282
OUR EDITORIAL TABLE	283
RECENT PATENTS	283
MEETINGS OF SOCIETIES	284
FORTHCOMING EXHIBITIONS	285
NEWS AND NOTES	285
EXCHANGE COLUMN	285
CORRESPONDENCE	286
ANSWERS TO CORRESPONDENTS	288

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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COLLOTYPE PLANT AND ITS COST.

On two or three occasions of late we have commented somewhat emphatically on the small amount of interest that photographers generally have hitherto taken in the mechanical processes, and on their having allowed them to drift into, and become established in, other channels, and outside their proper domain—photography. With regard to one process, and especially collotype, we have always maintained that it should have been taken up by photographers as an adjunct to their ordinary portrait or landscape business. There are very few professionals, particularly in provincial towns, who could not frequently obtain orders for a few hundred prints by a mechanical process at a remunerative rate, if they were able to make them themselves; but, as they now have to put th work out to be executed, taking the chance, as referred to ae few weeks back, of receiving a large proportion of the prints of a very inferior quality, and after having often to wait a considerable time for the work to be delivered, they frequently decline to entertain the business at all. If they had a small installation of their own, and could produce good results, that need not be the case.

There are few manufacturing towns, or pleasure resorts, where illustrations of the manufactures, and views of the local scenery, are not in demand, and collotype is undoubtedly the process for supplying them. It is a very general impression amongst the profession that collotype prints are not equal to silver ones. That is a fallacy. Collotypes can be produced quite equal to the best silver prints, and when they are glazed are often mistaken, even by experienced photographers, for them. That the majority of collotypes, produced commercially in this country, are very inferior to silver prints there is no denying; but that is not the fault of the process, but of those who work it. An advantage of collotype prints is that they can be produced in any tint or colour, and may be printed with a margin, and thus render after-mounting unnecessary. Furthermore, the work is permanent.

Many, no doubt, have been deterred from giving the attention they might otherwise have done to the collotype process from an imaginary idea that a very costly plant is necessary for its working, and our present object is to dispel that idea. Of course, to start a business on a large scale, with power machines which cost from two to three hundred—and more—pounds each, and engine to drive them, requires considerable capital. But we are here assuming that the photographer's object is to undertake orders of a few hundred copies f each subject at a time, and, as a matter of fact, such small orders can be more economically executed with hand presses than with costly power machines.

Now, the most modest photographic establishment has every requisite that is necessary for the photographic part of the work in the shape of cameras, lenses, printing frames, and other paraphernalia. The principal additional appliances required are a drying closet for drying the plates, and the printing press or presses, two or three ink rollers, and a couple of pieces of lithographic stones for the inking. There are also a few minor items required to complete the outfit, such as drying cloths, glass plates, palette knives, &c. The drying box, for a couple of 12×10 plates, with a paraffin stove, will cost about fifty shillings, the rollers about ten or twelve shillings each, and the stones a few shillings more. The most expensive thing is the printing press, but that is not nearly so costly as many surmise who have not gone into the subject. Almost any hand-printing press can be used for collotype. An ordinary lithographic press will answer, and at one time it was much used, the glass plate being fixed to a lithographic stone. A very useful size lithographic press will cost, new, about ten pounds, and a second-hand one proportionately less; but, on the whole, we do not recommend a lithographic press for collotype work.

The well-known "Albion" press, such as is used for letterpress printing, is largely used for the work, and it is as good as, in some respects better, than presses specially made for the purpose. Indeed, we are informed that some houses that turn out the best work that is done in this country employ this form of press exclusively. The prices of these presses vary of course, with the size, but they are somewhat more costly than are presses that are now made specially for collotype work. They also require considerable strength to pull them, inasmuch as the pressure is applied at once to all parts of the printing surface, whereas with the others it is applied successively, as with the lithographic press, by the scraper or roller under which it passes. The collotype presses supplied in this country are of two forms, one with a rolling pressure, the other with a scraping pressure. The former is the more expensive, and the latter the one in most general use for hand presses. The price of the latter, quoting from the catalogue of the makers, one of the oldest firms in London, is, for plates 9×6, 3*l.* 15*s.*; 12×9, 18*l.*; and for 18×12, 22*l.* These presses may be had from dealers at the same prices. In a couple of foreign price-lists now before us the prices quoted for presses of a similar construction, but with perhaps more complete fittings, is a little higher.

There is a collotype press in use in Germany—indeed, is in more general use than any other form of hand press—which is very simple in construction, though equally as good as the more expensive forms. Many of its parts are made of wood; therefore it is much lighter, as well as less costly, than if it were made entirely of metal. The prices of these presses, as given in the catalogues of two German houses, are about twelve pounds for a size to print from plates, approximately, twelve inches by ten with a good margin. The pressure with these is also by means of a scraper. Presses of this kind are not, we believe, made in England.

From the above it will be seen that the plant for working collotype, on a scale equal to the usual requirements of the general photographer, is by no means the costly affair that may have been imagined. For plates, say, twelve by ten and under, a matter of but twenty to twenty-five pounds for plant, beyond what every photographer already possesses, will cover all costs for outfit.

RETOUCHING SURFACES.

To the professional photographer the question of retouching surfaces presents in a way no features of interest, for the mere reason that he employs others upon whose shoulders falls the responsibility of the work; and amateurs, as a rule, do not trouble themselves very greatly with anything in the shape of retouching. But there exists a very large army of artists, both male and female, whose whole business consists in the improvement of negatives, and whose livelihood depends very materially upon the rapidity and ease with which they can get through the task of work. We read recently of one establishment where the tale is, thirty negatives between the time of starting in the morning and "lunch time," and thirty more before five o'clock in the afternoon—a truly handsome day's work at "popular prices."

This may, of course, be an exaggerated story, but in any case it is a matter of impossibility to turn out any really good work at such a rate, however favourable the conditions of working may be; while, to take the ordinary run of negatives as they come from the developing room, requiring all sorts and different kinds of treatment, both artistically and mechanically, it is scarcely possible to believe that any human being would undertake the task, except under the most severe compulsion.

But a great deal might be done by the operator—or, we will say, the photographer—to assist the retoucher and to alleviate his difficulties if it so pleased him; but, as a rule, the operator does not care two pins for anything beyond his own range of duties, and consequently the poor retoucher has to take things as he finds them, and in that condition they are not always as enjoyable as they might be; but, where the operator is also proprietor, or where the proprietor takes an intelligent overlook of his establishment, he may well give a little attention to the matter of turning out negatives that will give as small an amount of trouble in the retoucher's hands as may possibly be.

From one point of view this is, no doubt, done—that is to say that, so far as proper exposure, and density, and lighting are concerned, the operator has to keep within certain bounds or he will hear from both retoucher and employer; but, in the matter of the more mechanical or chemical turn-out of the negative surface, the retoucher is left almost entirely at the mercy of the one who develops the negatives.

There are many different methods of treating negatives previous to retouching. We have varnishes, ordinary and special, for retouching, retouching mediums, and preparations of one sort and another for bringing the surface of the negative film into a proper or comfortable condition to "take" the pencil, but we never, or hardly ever, hear anything of any attempt to bring the film itself into apt condition in the course of development; yet, to any one who has tried the experiment, it must be very quickly palpable that a very great power lies in the hands of the operator or developer of plates to assist or retard the retoucher in his work. As most of our best retouchers prefer to work first upon the film itself and to "finish" after varnishing, it may very well repay to give some little attention to the preparation of a suitable retouching surface by chemical means or by treatment of the film during or after development.

To illustrate what we mean, let a comparison be made between the surfaces of two negatives, taken upon precisely the same kind of plate, one of which has been simply developed, alumed, and washed, the other intensified with mercury. The one will present a hard polished surface upon which it is absolutely impossible to produce any practically useful impression without having recourse to a retouching medium, or, more probably, to varnishing first. The other, while exhibiting an equally hard film, will offer a "tooth" to the pencil and a surface for working on that throws any retouching medium or varnish that we have ever met with far into the shade for any but very heavy work; in fact, we question whether, on a fairly good chemically prepared film such as this, more "lead" cannot be got on than on any varnish or medium now in use.

The surface, in fact, presents an actual "grain," fine, it is true, but sufficiently marked to take the lead, and to go on taking it after the first application, which is more than most of the varnishes and mediums will do, as with them the first touch, light or heavy, settles the whole business, and, short of revarnishing, nothing more can be done. Grain varnishes have been tried, but, so far as we are aware, have not proved a very marked success, owing to the difficulty of getting a sufficiently fine and, at the same time, pronounced grain. We speak now of a mechanical grain, formed by the addition of some pulverulent material to the varnish; but in the old collodion days a different class of grain was obtained by adding chemical substances to the varnish, a practice not now permissible, owing to the comparatively tender nature of the gelatine film. The so-called *matt* "retouching varnishes" come under one or other of these heads, but they are really more fitted for application to the reverse side of the negative than to the film side for ordinary retouching.

But by suitable treatment of the gelatine film before drying, or it may be simultaneously with development, it seems to us that a far better result may be arrived at than by any of the methods in common use. It is true, we cannot resort to mercurial intensification of all our negatives, though that treatment, when admissible, affords every satisfaction that the retoucher could desire, and unfortunately the beneficial action of the mercurial salt cannot be secured without its other effects. There are, however, other means which may be resorted to for producing a fine grain without in any way injuring the negative, which we hope to refer to in a future article.

Care of the Eye in Astronomical Work.—In observing some stages of eclipses and other bright objects, it has very frequently happened that the eye has been incautiously exposed to the blinding

light. In these days of photography and automatic recording instruments, it might be thought that such risks might be entirely done away with. Galileo and Sir Isaac Newton are supposed to have suffered from this cause, and Dr. G. Mackay, in a pamphlet he has written, describes seventeen cases of such injury that came under his notice; but, then, neither of those two eminent astronomers had the advantage of photographic aid.

Metric Weights.—It is fairly well known that, by Act of Parliament, the metric system of weights and measures is permissible in this country, but it is by no means well known that the permission only applies to substances sold in internal trade. It is against the law to send a cask of "hypo," containing fifty kilogrammes, to the Continent, but a dealer in London may, without fear of penalty, invoice that quantity to his next-door neighbour, or to a dweller in John-o'-Groats. The London County Council have determined to do their best to bring in a modifying Bill, and, meanwhile, have determined not to have any one punished who breaks the law in this direction.

Removing Precipitated Sulphur when Testing.—The familiar milky appearance of hypo solution after the addition of certain reagents is due to the precipitation of the plastic form of sulphur in a state of fine division. Its presence is sometimes very inconvenient, as, for example, when ascertaining the amount of silver or other metallic sulphide. Fresenius has devised an ingenious remedy. Placing the milky liquid in a test tube, he adds about half a drachm of benzole, or paraffin ether, and shakes violently for a minute. When the solution is allowed to subside, it will be in two layers. The benzole at the top will contain the whole of the sulphur, and leave the rest of the solution to be examined in the ordinary manner.

Electric Heating.—It has been assumed by too many that, because nothing more has been heard of electric heating, discussed some year or two ago in these columns, it exists only in imagination. This, however, is quite a mistake, and it was only the other day that Mr. Compton delivered at the Society of Arts a lecture on the subject. Certainly his remarks were upon cooking by electricity, but it is obvious that this is only one branch of electric heating. He states that an electric oven is twice as cheap as any other heating mode. Of course, only just as much heat is used as is needed, and used just on the spot where necessary; but a heater that will make a few cups of coffee will naturally be equally available for boiling a pint of water, and Mr. Compton's remarks lead us to think that electric heat in the dark room is possible in the near future.

The Shrewsbury Meeting of the Convention.—Mr. R. P. Drage, Hon. Sec. of the Convention, writes: "I have to inform you that this year's meeting of the Photographic Convention of the United Kingdom will be held at Shrewsbury, during the week commencing Monday, July 15, under the presidency of A. Haddon, Esq. The Shrewsbury Reception Committee, consisting of the leading aristocracy and gentry of the district, are making great preparations to ensure the success of the meeting, and the central position of Shrewsbury, with the attractions that will be offered, will probably be the means of drawing great numbers of photographers from all parts of the Empire. The various excursions which have been arranged for the week will afford great variety both in landscape and architectural work, and the railway journeys will mostly be shorter than has been the case at former Convention meetings. Various pleasant excursions also by road have been arranged, and it may also be pointed out that Shrewsbury itself abounds in subjects photographically interesting. There will be an Exhibition also, and various important papers will be read and discussions held during the week of meeting."

Photometry and Star Photographs.—Those photographers not very familiar with astronomical matters when discussing the universal star map project, apprehended little difficulty beyond that entailed by the necessarily protracted exposure required for the fainter stars. But that difficulty was merely a mechanical one, which could be overcome without much trouble. The point which most exercises the minds of those interested is how to determine the so-called magnitudes of the stars depicted, or, in other words their relative brightness, magnitude being a rather misleading word, as none shows more than a point of light in a theoretically perfect telescope. Many plans have been suggested to solve this problem; but in this place it would require too much space to merely enumerate them. As an example of what we mean, we may say that increase of brightness or of exposure increases the size of the discs produced on photographic plates. At first, it was believed that their diameter varied as the square roots of the exposure; but, upon taking to the use of dry plates, the fourth root was considered to be nearer the mark. The Astronomer Royal and Professor Turner have shown that neither of the two is right, and so on. The whole subject is very ably treated in the pages of *Nature*, and those further interested we may direct to pp. 558 *et seq.*, No. 1328, of that periodical.

Hypo and its Decompositions.—Mr. C. H. Bothamley's remarks in our last issue with regard to the hypothetical nature of many of the suggestions of MM. Seyewetz and Chicandard in their paper on the decompositions of hypo are worthy of all attention. At the same time it cannot be denied that their observations, be they hypothetical or otherwise, go far to explain some points hitherto inexplicable from a photographer's point of view, although the conclusions arrived at by these gentlemen may not be immediately accepted by chemists generally. As we pointed out in our article, the chemist pure and simple would study the question from a very different point of view from that of the practical photographer or the photographic chemist, and it need not seem very strange if a series of experiments instituted from a purely photo-chemical standpoint should yield results differing from the generally accepted belief in a not over-studied direction. Chemists, as a rule, are remarkable for their conservatism and their disinclination to accept anything that is not supported by experimental evidence, although our text books teem with instances of doubtful observations attributed to authorities of recognised standing. To our thinking, a subject such as that dealt with by MM. Seyewetz and Chicandard, aided, as they acknowledge they were, by MM. Lumière, is more likely to be thoroughly done from a photographic point of view than would be the case if it were taken in hand by a Royal Commission.

VOIGTLANDER'S COLLINEAR LENS.

Having, through the kindness of Messrs. Marion & Co., Soho-quare, Voigtlander's agents, been afforded an opportunity of studying and carefully trying this new lens, which has won such golden opinions on the Continent, we purpose giving a brief account of it, not from the scientific testing aspect, but from the ordinary practical photographic point of view.

From external observation one immediately discovers that it is a symmetrical doublet, front and back lenses being similar in form and focus. The focus, measuring from between the lenses where the stop (an iris) is located is six inches, and the remark may here be interpolated that, although we have examined others, the special one of the Collinear series on which most of our remarks mainly hinge is that described in the Marion Catalogue as No. 3, having an equivalent focus of 150 millimetres, 26 millimetres in diameter, covering with full aperture a plate $6\frac{1}{2} \times 4\frac{3}{4}$ inches, or, roughly, $8\frac{1}{4} \times 6\frac{1}{3}$ inches when stopped down from *f*-18 to *f*-36. These are approximate catalogue measurements. The price of this lens, with iris diaphragm, is 7*l.* 10*s.*, and the cut here given represents exactly its size.

Disregarding for the moment the smaller size mentioned as being covered with full aperture, we had the lens attached to a whole-plate camera, and with full aperture (*f*-6·3) we focussed a test object, situated at a distance of about 400 feet, directly on the centre of the ground glass, using an eyepiece in focussing. The camera was then

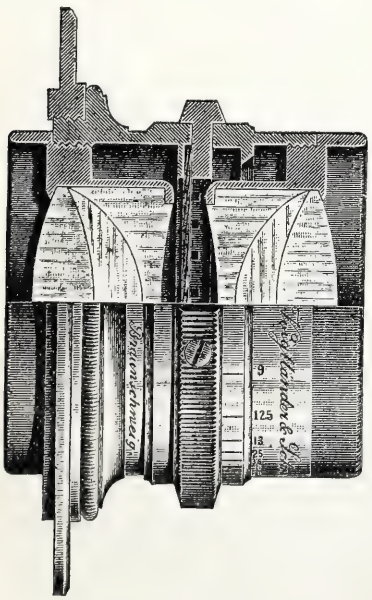
slowly rotated so as to bring the test object up to the extreme edge of the ground glass, focal examinations being occasionally made during the rotation. The sharpness of the object was maintained until the object disappeared beyond the margin of the focussing screen.

Finding this to be the case, we transferred the lens to a 10×8 camera, and repeated the trial, still with full aperture. The flatness of field was still of the most pronounced character, except at the extreme edges. The corners too were dark. A good panorama, $9\frac{1}{2} + 6\frac{1}{2}$ inches, could have been cut out with perfect sharpness throughout, which, for a lens of such shortness of focus and width of aperture, must be considered as somewhat astonishing.

Our attention was next directed to the employment of one lens alone, viz., the back one, which was left *in situ*. With this the whole of the 10×8 screen was covered with a degree of sharpness, no stop being employed, amply sufficient for every pictorial purpose, showing a freedom from spherical aberration which we were not prepared to find in any single cemented lens, no matter what might be its components. On reducing the aperture the crispness of the definition seemed to be slightly improved.

Far different was the case when the front lens was tried alone, also *in situ*; it was sharp in the centre, but by no reasonable amount of stopping could the plate be covered. One thing, however, was discoverable, which was that the optical centre of each lens is situated considerably outside the convex surface of the lens, much more so than in the case of lenses made in a less complex manner. This, also, is evident—if a single element of this combination is to be employed alone, it must have its concave surface to the outside, or directed towards the subject. We considered, from an inspection of the behaviour of the single lens on the 10×8 plate, that it would not be unreasonable to expect it to cover 12×10 with perfect sharpness.

As a lens of what may be supposed a novel form, we can only regret that no information as to the nature of the glass appears to have been forthcoming. One thing, however, is apparent: Messrs. Voigtlander appear to have obtained the admirable results we have described by means of glass of singular purity, both as regards freedom from colour and air bubbles in the glass—not that the latter signifies much when in moderation, although mechanical perfection even in this is desirable. Yellowness in the glass is at all times to be deprecated as tending to slowness of action. We gladly await further information as to these points, and request Messrs. Marion to supply it.



Each element in this doublet will be seen from the illustrative block to be formed of three cemented lenses of different forms. Measuring one of these from the outside, the first is a double convex, the second a deep meniscus, the third a crossed concave, the whole forming a meniscus. We could discover no trace of astigmatism.

We learn from Dr. Eder's report concerning the Collinear that it was introduced to the Imperial Institute of Photographic Investigation in Vienna, on September 15, 1894, specimens of the same having been distributed in the following November.

JOTTINGS.

I THANK those gentlemen who have written to point out that the table, "Equivalence of the Alkalies," which I gave a fortnight ago, stands in need of revision. That the last line is meaningless arises from the fact that by an oversight the column headed "Lithia" was omitted from its place between the columns devoted to carbonate of potash and ammonia. For the rest, the figures of the table exactly tally with those given in the source from which I took it, viz., *Aide-Mémoire Pratique de Photographie*, by M. Albert Londe, p. 177. The same table also finds a place in Fourtier's *Dictionaire de Chimie Photographique*, p. 303. Both these gentlemen are, as a rule, so accurate and so careful in their data, that it never struck me, when transcribing the table, that any necessity existed for scanning or proving the figures. As, in an excellent article on the subject, Mr. W. B. Bolton, who years ago made it all his own, has since kindly given a table he has specially calculated, which is possibly more useful than the one I reproduced, even if it were revised and adjusted, I need make no further reference to the matter beyond expressing my regret at having accidentally misled and confused some of my readers.

Mr. Dewey Bates, in the last number of the *Studio*, has an illustrated article on "George Clausen and his Work," from which I make an extract, because it enshrines one or two truths and principles from which young photographers, burning to gain distinction in pictorial camera work, and standing in some danger of being influenced by the blatant arrogance and self-assertiveness of the new (or miasmic) school of photographers, may derive hope and encouragement. Mr. Bates writes appreciatively of his hero, of course, but, nevertheless, temperately, and with a well-restrained use of praise. Says he: "Lovers of mysticism in art, of weird effects, or vague suggestion, must seek it elsewhere than in Mr. Clausen's work. He holds the mirror up to nature, whether it be in the delineation of a ploughed field, a weather-beaten, wrinkled woman of the fields, a ploughboy, or a country maiden. He puts them before you with all the infinitely delicate effects of atmosphere, with the reality of truth, with the simplicity of nature." Surely every word of the foregoing deserves to be remembered by the young photographer who has not yet realised that the mystical, the weird, the vague, does not lie within the province of photography. In different language, Mr. Bates utters, as it were, the same little sermon I have been preaching for many a day—viz., that photography finds its greatest and its best opportunity in simplicity of theme and fidelity of representation.

Here is a timely protest against hurry and haste in one's (photographic) work and a grateful, good word for the bright, the glowing, the homely in picture-making, which also deserves to be pondered over by everybody who uses a camera: "As to his methods, if genius is the capacity for taking infinite pains, as it has been so defined, then Mr. Clausen may lay claim to the distinction. He has no trade secrets, no mysterious mediums. Gifted with a great love of his art and an indomitable perseverance, he spares no pains in his efforts to represent the truths he sees in nature, and this in the simplest possible manner. . . . . His pictures of country maidens and lasses are full of the freshness of the air which they breathe. In an age somewhat inclined to be dyspeptic, it is a pleasure to look upon his wholesome toilers, ruddy with the glow of health or bronzed with the suns and snows of an outdoor life."

Attempts are being made to revive, or rather create a greater, interest in ceramic enamel work. I wish the movement every success. Nothing is so pleasing as a well-executed agreeably toned burnt-in photograph; nothing, if I am not grievously wrong, requires so much care, patience, or skill, to work with the uniform success that commercial exigencies demand as this same ceramic enamelling, no matter what process for the production of the transparency be adopted. However, may good luck attend all well-meant efforts to rouse photographers from their groovy lethargy, and may the public be brought to realise the advantages of buying imperishable plaque photographs. About four years ago, when the Princess of Wales had some of her photographs transferred to plaques, it was thought that an impetus would be given to enamel work, but that did not turn out to be the case. By the way, articles dealing with ceramic enamel work are to be found in this JOURNAL for April, 3, 10, 24, 1891; and October 6, 1893. The details given

are sufficiently clear and copious to enable the photographer to start experimenting with any one of the various processes dealt with.

Neglected processes and the opportunities they offer for the revival of business have frequently been described and discussed in these pages, and, now that the resurrection fever is likely to assume the dimensions of a small epidemic, it is not improbable that, when one revival has run its course, the storehouses of photographic antiquity will be ransacked for other fossilised stimulants to business. The Daguerreotype process, now! What more beautiful, what (judging by existing examples) more permanent than photographs produced by this method? It is fairly easy to work, and its comparative costliness affords a photographer fine opportunities for making good profits. Of course, it may be said that it is slow; but, then, what capital scope that defect gives for experiments undertaken with the object of increasing its rapidity! Besides, is it, under some circumstances, so slow, after all? I fancy that the veteran, Mr. J. Werge, could tell a different tale, for, unless I err very much in my history, he took, some forty odd years ago, *an instantaneous Daguerreotype view of New York Harbour!* There is obviously a very great future for the Daguerreotype process. When will people learn the invaluable lesson—that progress takes two directions: forwards and backwards?

The large order for collotypes that recently went a-begging among English printers came to my mind the other day when chatting with the commercial manager of one of the largest, if not actually the most extensive, collotype-producing firm in this country. This gentleman fully confirmed all that has been said as regards the severity of competition there is in collotype work, and he further informed me that the sole chance his firm had of either securing remunerative orders or of eliciting satisfaction when they were executed was in delivering the prints, no matter how large the number, of a uniformly good quality throughout, and of thus obviating the necessity of rejections or throws-out. "This," says he, "is the only respect in which I can secure an advantage over my competitors." What a simple yet invaluable lesson is this, and how little we should hear of the cry for new or artificial aids to the revival of business if only the ordinary professional photographer would bear it in mind and put it into practical application. And, oh, the shocking wretchedness, the ghastliness, the grimy crudeness of the specimens with which so many photographers are content to adorn the windows or façades of their ateliers! Surely, nothing can be more damaging to them or depressing and repellent to the public whose patronage they live to attract?

But something more than good work and its obvious concomitants are nowadays needed for success in professional photography. Do you know what a "good bedside manner" often means to a medical man? A handsome income; maybe a fortune. It is frequently more healing and beneficial to a patient than his nasty medicines and drugs; it inspires hope and confidence; cheers and inspirits the sufferer; works half the cure, and thus secures its fortunate possessor a lucrative reputation. It is all summed up in one little word—tact. The man of tact always does and says the right thing at the right moment; puts those about him at their ease, and therefore allows them to be natural and unconstrained; whereas, a man without tact is not only awkward, angular, and forbidding in demeanour himself, but instantly develops a similarly unsympathetic condition of mind and attitude in those with whom he is conversing. Hence you can see that, to a photographer, a "good studio manner," if I may so designate it, may have such a soothing and ease-giving effect on his sitters, that it will make all the difference between success and failure in the character of the portraits he takes. The old witticism about the sitter going to be photographed feeling as if he were about to have a tooth removed, was, I am convinced, called into existence by the neglect of photographers to cultivate a "good studio manner." Unfortunately, it retains its point even to-day in only far too many cases.

In my own experiences of being photographed, which are not inconsiderable, I am amused to reflect that the one portrait of myself which is pronounced to be, both pictorially and in point of resemblance to the original, the best I have ever had done, was obtained under conditions with which, I take it, few professional photographers would be diurnally content. This was taken eight years ago in an upper lumber room by an amateur friend. The main light was obtained through three frosted windows facing south, and the shadow side was lighted by means of reflectors, consisting of sheets of plain white paper. I had to sit without the help of a head rest for over a minute; but, notwithstanding this and other drawbacks, the result, as I have said, was capital, towards which I have no doubt the fact, that I was thoroughly at my ease and at home with my friend and with my surroundings, in a great measure contributed. I instance this trivial circumstance to emphasise my point, which, I fancy, is much overlooked by professional men, that an intelligible and, if possible, mutual sympathy between photographer and sitter is of vital importance in enabling the former to achieve success in transferring the individuality of the latter to paper.

Since that time I have been taken in all kinds of studios, ornate, elaborate, mean and dirty, and have accumulated quite a collection of pretty and ugly photographs, which flatter, libel, or disguise me, but do not show me, or anybody else, *myself*. If I am asked to give a general explanation of this all-round failure, of which the non-photographic public have on their part great cause to complain, I should say, paradoxical as it may look, that the ordinary photographer is usually too much of a photographer, and that the ordinary photographic studio is too much of a photographic studio, and that the consciousness of all this reacts, as it were, to make a sitter feel that he or she is about to be subjected to some quasi-scientific experiment, instead of being presented with the opportunity of giving rein to that unrestrained ease of feeling and manner by which, as it were, one draws one's own portrait for the photographer to copy. To assure this excellent end, what I have tried to delineate as a good studio manner is probably invaluable; and this consists, I suggest, in the photographer keeping photography as much as possible in the background, and acting, so to speak, more as a host, than anything else, towards his sitters.

I found myself the other day in the studio of a gentleman who, while possessing a very high reputation in a branch of photography which does not greatly bring him into personal contact with the public, devotes a portion of his time to portraiture. His studio is of an utterly unconventional type, and, but for the necessary presence of the camera, it would not be divined at a casual glance that it was devoted to photographic purposes—the china, mirrors, mats, old-fashioned seats, tables, hangings, curtains, and simple, yet tasteful, decorations giving one more the idea of being present in an artist's den (swept and garnished). In addition to the agreeable, homelike air of the place, I was inwardly much struck by the efforts of my friend to engage me in the discussion of a variety of congenial topics which, as he afterwards confessed to me, he had chosen with the idea of getting me, so to speak, to show him *myself* in facial expression and attitude. In the course of half an hour he exposed six plates upon me, and did not conceal from me his satisfaction at having got the "real Cosmos" to present himself to the recording lens. This was certainly the pleasantest experience I have had of being photographed, and, if all photographers would take the same trouble with their sitters as my friend took with me, I doubt not that mutual satisfaction would more often result. I should say that my friend who confessed that he preferred photographing people he knew and had studied, stated to me that the trouble he took in trying to understand a day's sitters imposed a great mental and physical strain upon him.

Nothing in the popularly pictorial sense has been published of late years which has, so to speak, caught the eye so completely as the colour productions of the Photochrome Co., 61 and 63, Ludgate-hill. This Company has laid itself out to show what delightful

pictures are to be obtained by the conjunction of pure photography with colour printing and the results which have been before the public for some years have met with a degree of favour which attests in a remarkable manner the happiness with which the aspirations of the multitude in this regard have been gauged. The Company's series of views is an enormously lengthy one. The world, as it were, is pictorially shown in colour and a vast number of people are thereby pleased and gratified. Mr. White, the London Manager of the Company, tells me that a new series of views of Palestine, Syria, the Isle of Man, North Devon, and several of our most popular seaside resorts, is under way, and as if to whet my appetite he has been kind enough to show me some photo-chromes of the haunts I love so well, including Margate, Yarmouth, Lynmouth, the Isle of Man, and Canterbury. Nothing could be more attractive and at the same time so artistic; and many a photographer, desirous of adding an extra string to his bow, would be wise if he included these charming productions among his saleable stock.

The rock-blasting operation, as described last week, of which a photographic record was taken, was, as might be deduced, a great thing in its way. My friend, Mr. E. Miles, of the London Stereoscopic Company, which Company had the matter photographically in hand, has been good enough to show me a series of prints from the negatives taken on that occasion. These were secured by the aid of Ross-Zeiss lenses, which worked and defined perfectly, and are admirable examples of a difficult branch of work. In one view the obstructive rock, towering over 360 feet high, and weighing 250,000 tons, with the quarried rocks rising in tiers behind it, is shown; and in another the actual explosion, when the huge rock, under the influence of seven tons of gunpowder, is in progress of disintegration, is clearly depicted. These are splendid specimens of an out-of-the-way kind of photography, which do credit to everybody concerned in them, and no higher praise can be given to the results. COSMOS.

CARBON PRINTING NOTES.

SINCE I wrote in a recent number of the LANTERN RECORD on the subject of *Vignetting by Artificial Light*, several queries have reached me with regard to difficulties experienced in obtaining perfect gradation in vignetting masks by the carbon process, and I propose to take this opportunity of replying more fully to my different correspondents than I can possibly do to each individually.

I suppose it is generally understood that it is to some extent more difficult to produce perfect vignettes by the carbon process than by the ordinary methods of silver printing, in fact, at one time it was considered that the former method of printing was not practically available for the purpose, owing to the great amount of care required. But in reality, under modern conditions of working and with the materials now readily available, there is little if any difficulty if the conditions necessary are fully recognised. It is an undoubted fact that many operators, especially amateurs, who are fully capable of turning out good work of the ordinary kind, fail signally when they attempt vignetting, the gradation being harsh and abrupt instead of gradual and delicate, the edges of the softening being rough and ragged. This is due to a variety of causes or may be avoided by the observance of a few simple precautions, which may be considered *seriatim*.

In the first place, the strength of the sensitising bath exercises a by no means unimportant influence in this direction. It is pretty generally understood by carbon workers that, the weaker the bichromate bath, the greater the contrast produced in printing; and, conversely, the stronger the bath, the softer the image and the more delicate the gradations. Consequently, in order to obtain the gradual softening away of the image, so desirable in vignetting, it is advisable to employ a bath of full strength. But, at the present day, when the general run of portrait negatives partakes rather of the soft and delicate character than the strong and vigorous, there is a tendency in the direction of weak baths, and, instead of the standard five per cent. strength, two and a half per cent., or even less, is frequently used.

Under such conditions, although the gradations of the negative itself may be better rendered, the difficulties in vignetting are materially increased; therefore, it is a good principle to bear in mind that the bath should be as strong as it is possible to employ for the class of negatives in use. I am speaking now of ordinary vignetting; but, where the production of vignetting masks alone is concerned, it is, of course, not only desirable, but easy, to use a bath of full strength, say, not less than five per cent.

In ordinary vignetting, where it is necessary to consider simultaneously the character of the negatives as well as the requirements of the vignette, I have found great advantage in the addition of ammonia to the bath, as first recommended by the late Mr. J. A. Spencer. By this addition, although in solution the chromate is converted from the acid to the neutral form, on drying the tissue or evaporating the bath it reverts to the original state; and, whereas the neutral chromate confers very little sensitiveness, tissue prepared in the manner stated seems to be more sensitive than that sensitised with plain bichromate, besides possessing other good qualities. Amongst these I find better keeping qualities, as well as a tendency towards softer gradation.

But, strength for strength, the alkaline or neutral bath gives stronger contrast than one prepared from plain bichromate; in other words, a five per cent. solution *plus* ammonia will behave in much the same manner as a solution of half the strength without the addition. Therefore it is necessary to increase the strength of the bath, which is easily done, owing to the fact that the ammonia renders the bichromate much more soluble; in fact, there is no difficulty in making a ten per cent. solution with water at the ordinary temperature. The bath I recommend consists of two ounces of potassium bichromate and one ounce of strong ammonia to a pint of water. This proportion of ammonia of the full strength of ·880 will just about remove the red colour of the bichromate, and give a yellow solution of neutral chromate, though, on drying, the back of the tissue will be as deep in tint as if bichromate had been used. Another feature of the alkaline bath is that, notwithstanding the increased strength, there is no more tendency to crystallisation of the bichromate on the surface of the tissue.

This bath behaves, so far as the density and gradation of the negative are concerned, much in the same manner as an ordinary five per cent. solution, with the advantage that the development is more easy; and, on diluting it, preserving the same proportions between the ingredients, greater vigour is obtained from thin, soft negatives, without the corresponding difficulties in the gradation of the vignette. Hence I recommend the ten per cent. solution to be taken as the basis, to be diluted as may be required for the character of the negative.

The next point that may be taken is the age of the tissue—that is to say, the time allowed to elapse between sensitising and use. It is well known that freshly sensitised tissue works with greater vigour and contrast than when it is a few days old, and in the latter condition it is in a far better state to render and preserve the delicate details in the high lights of a picture than when newly sensitised. Therefore, for vignetting purposes, the tissue should always be kept for two or three days at least before use, every precaution being, of course, observed to protect it carefully from all deleterious atmospheric influences. Such tissue is slower in development, but there is less tendency to lose the finer details, and especially the delicate softening of the vignette.

Then we come to the development itself. Although it is perfectly easy in comparatively experienced hands to develop an ordinary print upon bare glass or opal, it is a practical impossibility to do the same in the case of a vignette. It is easier if the glass be collodionised, but even this preparation does not suffice to preserve the extremely delicate softening of a vignette, or to prevent a certain degree of coarseness or reticulation in transparencies, especially such as are intended for enlarging from. For these purposes nothing short of a substratum of insoluble gelatine or albumen will suffice; but this, applied to the glass or to the collodion surface when it is intended to transfer the carbon image to paper, renders the operation of vignetting perfectly easy. I do not know in fact that, even for

the production of the enamel surface, collodion is at all necessary, for I have without difficulty transferred from glass French-chalked and subsequently coated with bichromated albumen. If wax be used instead of talc, it is extremely difficult to get an even coating of the substratum, which is its chief objection. Talc, however, presents no such difficulty.

The strength of the albumen solution is not very material, provided it is not too thick to flow evenly; it may be anything between one in six and one in twelve, and, instead of plain bichromate, sufficient of the alkaline sensitising solution may be added to give it a strong yellow colour. If this solution be kept a few days and then very carefully filtered, it will flow upon clean glass as smoothly as collodion, and, if the glass be "talced" (horrible word!), does not recede from the edges as the acid solution has a tendency to do. Plates coated in this manner, previously carefully dusted and allowed to drain upon blotting-paper, may be dried at the fire, and present a surface that is difficult to distinguish from bare glass. When dried, they should be exposed to light to harden the albumen, and are then ready for use.

Gelatine may be substituted for albumen, if preferred on the score of economy, though it is more difficult of application, and is otherwise inferior, I think, to albumen; the strength may be anything from five to twenty grains to the ounce—but the thinner the better in my opinion—coloured in the same way with the chromate solution, coated, drained, dried, and exposed to light, as in the case of albumen.

Upon this surface, if thoroughly wetted before squeegeeing the exposed tissue into contact, the most delicate details adhere tenaciously, and for vignetting it is absolutely essential, as it almost entirely prevents the chance of the raggedness of edge already spoken of. Not quite, however, for to ensure perfect success some degree of extra care must be devoted to what is always a rather ticklish operation.

The only objection to the substratum is that, in case it is desired to intensify the image with permanganate of potash or other chemical, the high lights or "clear glass" become tinted, a fatal objection in the case of a transparency or other picture, though, in the case of a vignette mask, it only leads to a slight increase in the time of printing. In the latter case, if the method of printing through the glass, mentioned in my article last month be adopted, this slight disadvantage may be avoided. In that case, let the substratum be preferably gelatine and chromate, but unexposed to light before use, under which conditions albumen would be dissolved off the glass on wetting. The sensitised tissue is squeezed into the surface of soluble gelatine, which, when dried and exposed, is rendered insoluble only on those portions that are exposed, and is entirely washed away in development from the parts representing clear glass, and thus the disagreeable or objectionable tint is avoided when intensification is resorted to. But this plan is, of course, not available with ordinary pictures unfortunately.

The few simple matters detailed, if carefully observed, add but little to the trouble involved in the process of printing, but conduce very materially to ultimate success. Other precautions, such as filtering the bath and generally avoiding dust at every stage, one would think so obvious as to scarcely need mentioning, but some of my correspondents seem to think otherwise. W. B. Bolton.

THE EQUIVALENCE OF THE ALKALIES.

The construction of an accurate table showing the relative alkalimetric values of the various alkalies appears to be fraught with difficulty to the compiler. "Cosmos" advances a table which, as several correspondents have pointed out, is wrong on the face of it. In last week's issue, Mr. W. B. Bolton seeks to rectify and to extend the table of "Cosmos" in an article on *The Comparative Developing Values of the Alkalies.*

I have always held, and do still hold, a profound respect for the writer of this article as a photographer of wide practical experience, and I can only regret that a similar respect of his powers as a chemical arithmetician is not inspired by a very careful perusal of the table of equivalent alkalies which he embodies in his article. As it seems undesirable that a table possessing so many and such grave inaccuracies should gain currency amongst photographers, I here append a third, and what I believe to be—and the calculations have several times been checked—a strictly true expression of the alkalimetric equivalents of the alkalies employed in photographic operations. It will be observed that I have substituted for ammonia gas in column three the strong solution sold as "liquor ammoniæ purissimæ," of specific gravity ·880, and which contains about 35 per cent. of real ammonia.

It should be noted, however, that when using this column for calculation the ammonia solution must be weighed, and not measured, otherwise the figures given have no signification.

Table.

Equivalence of the Alkalies.

Caustic Soda.	Caustic Potash.	Ammonia (·880 solution).	Carbonate of Soda (anhydrous).	Carbonate of Soda (cryst.).	Carbonate of Potash (anhydrous).	Carbonate of Potash (cryst.)	Sesquicarbonate of Ammonia.
80	112	97·14	106	286	138	174	127
1	1·400	·867	1·325	3·575	1·725	2·174	1·587
·714	*1*	1·211	·946	2·553	1·232	1·554	1·134
·834	1·153	*1*	1·091	2·944	1·421	1·791	1·307
·755	1·033	·916	*1*	2·698	1·302	1·641	1 198
·280	·392	·340	·371	*1*	·483	·608	·444
·580	·812	·704	·768	2·072	*1*	1·260	·920
·460	·644	·558	·609	1·644	·793	*1*	·730
·630	·882	·765	·835	2·252	1·087	1·370	*1*

The figures in the above table dealing with sesquicarbonate of ammonia are obtained on the assumption that the whole of the ammonia—that combined as carbonate as well as that combined as bicarbonate—is available for developing purposes. It is uncertain whether this is actually the case or not, but, in face of the somewhat indefinite composition of commercial carbonate of ammonia, the figures given may be regarded as being within the limit of error.

In looking over the above table there is one thing that must strike any one who gives the matter his attention, viz., the large quantity of crystallised carbonate of soda that must be taken to be equivalent to most of the other alkalies. One ounce of anhydrous sodium carbonate is equivalent to 2 698 ounces of the crystallised salt. Yet I suppose that sodium carbonate crystals is the salt most extensively employed for alkaline development. For my part I much prefer to use the anhydrous carbonate. It is generally purer than the crystallised, it dissolves in water with much greater readiness than that salt, and can be made quite dry by exposing it in a porcelain dish for a few minutes to a moderately high temperature. Its employment was, I believe, recommended some years ago by Mr. Chapman Jones. For those who wish to have a definite basis on which to work, it is the alkali to employ *par excellence.*

G. E. Brown, A.I.C.

CARBON TRANSPARENCIES.

(Photographic Club.)

Carbon transparencies are, by repute, and for many purposes are probably in fact, the best of their kind. For purposes of negative reproduction and enlargement, the intervening transparency should retain all the gradations, and all the fine details, of the original negative, and the process which retains these most perfectly will be, other qualities being equal, the best process.

I do not intend to-night to enter upon the larger question of why the carbon method is or is not in theory the best one, but to deal with a few of what I will call the rule-of-thumb points of practice: and my object will be rather to start a conversation, in which some of you will give us the benefit of your knowledge and experience than to attempt the task of teaching myself.

It is curious to note how various workers strive towards the same goal by different routes, but it is more astonishing to observe that they arrive at the desired end notwithstanding their differing methods of procedure. Photography is a pursuit. I think that is a careful evasion of the point whether it be an Art with a capital, or a science in which, as in life itself, a careful observance of well-established rule of thumb often carries one further and more successfully than does a sincere desire to follow a course dictated by considerations of theory. As regards the conventional excellence of the carbon process, I cannot avoid coming to the conclusion that it is

mainly on account of its lack of mobility that it is considered so excellent for reproduction transparency work, and is so little in use as a printing medium for work of small dimensions, or for lantern-slide work. The possible variations in gradation from a given negative are slight, and the process of development is best when it is quite mechanical.

In brief, with the carbon process in reasonably good working order, the character of the gradations of a transparency can be anticipated with certainty, and there is but little, if any, power of varying them, and no call at all for judgment in development. These conditions are so exactly the opposite of those which obtain with a gelatino-bromide plate that the functions of the two processes naturally appear to be that carbon should be used with good technical negatives, and bromide (gelatine) with such as require modification.

If these premises be true, and I think they are, the belief that carbon produces the best transparencies must be held rather as a pious opinion than as an article of faith. It is the truth, but not the whole truth.

One often hears of the superiority of the foreign article, but, so far as carbon tissue is concerned, I have a distinct preference for the home-made article.

I think that the transparency method which comes nearest to carbon in fineness of grain—for that is, perhaps, the great distinguishing feature of carbon—and transparency in the deeper deposit—a quality of equal value, and one in which the carbon process is at its best—is the print-out gelatine emulsion plates of the Paget Company. There is, however, an objection to their use, which is of the practical order, now that the average length of life is under one hundred years, and that is the inordinately long time occupied in the printing.

The great principle to be observed in the preparation of carbon tissue for transparencies is to keep the tissue in a soluble condition, and this is best effected by using a limited quantity of the bichromate sensitising solution and throwing away any overplus of solution. The same purpose is attained by purchasing ready-sensitised tissues, in which the bichromate is incorporated with the colloid coating, but this is not always convenient or even practicable. A three per cent. or four per cent. solution of potash bichromate may be kept in bulk, and sufficient taken to soak the pieces of tissues required for use. The use and re-use of old sensitising solutions imparts an element of uncertainty into the process which is both troublesome and unnecessary.

It is an advantage sometimes to add to the bichromate bath five per cent. of glycerine, and I find that in this way I can get, if I require it, much greater contrast in the print. As a matter of fact, I more frequently use treacle or golden syrup than the glycerine, and the effect is equally good. There is the added advantage that the tissue does not cockle so much in the drying when the pieces are too large to squeegee to a glass or ferrotype plate.

For transparencies the tissue should always be dried against some rigid substance so as to secure a flat surface and consequent complete contact in the printing frame, and it is quite possible to dry it too rapidly. Seven or eight hours is a suitable time for drying, certainly not less.

Unless the surface of glass upon which the transparency is to be developed be prepared, there is a risk that some of the finer tones may be washed away. It is usual to coat the glass with a gelatine and bichromate solution, which, after drying, is exposed to daylight, and so becomes insoluble. For this purpose I prefer a white, clear gelatine, such as Coignet's gold medal. A five per cent. solution of Coignet's gelatine, to which are added fifteen grains of bichromate (in solution) to each pint, will be found to work well. It is important to bear in mind that the gelatinised glass must be sufficiently exposed to light to completely render the film insoluble. If this be not attended to, the substratum, instead of being a source of strength, may be an actual cause of mischief when the laid-down tissue is placed in hot water for development.

In order to avoid the necessity for preparing these substratum glasses beforehand, and the loss of time, when that is an object, I prefer to polish the glasses with a five per cent. solution of chrome alum, to which has been added a little alcohol, which must be free from grease. The spirit is not necessary, but helps to evaporate the alum water when polishing.

I have referred to the development of the tissue after exposure as being an operation in which there is no call for judgment. As a matter of fact, of course, the operation can only be called development in the dictionary sense, and not as photographers understand it. Provided that water, only sufficiently warm to effect dissolution of the unaffected gelatine, be used, the less saving the better. It is said that over-printed pictures can be developed and saved by the use of hotter water and the addition of a little liquor ammoniæ.

I generally find it more satisfactory, and quicker and cheaper, to print again to suitable depth. With carbon work, as with negative work, much—almost all—depends upon an approximately correct exposure.

For exposure measuring, a Warnerke sensitometer is very convenient; but a sensitometer composed of strips of paper pasted upon a quarter-plate glass in the well-known method serves equally well, and there is no need to bother one's head whether the increase of thickness be in arithmetical or geometric ratio, so long as the increases are strongly marked.

I have brought a set of transparencies for your inspection to-night made in various coloured tissues, my idea being to illustrate the possibility of varying the tone values by the use of pigments of different actinic values. The colours are green, blue, brown, red chalk, and the ordinary transparency tissue, which may be said to be a green brown. Incidentally, it will be noted that it is not necessary to use the special transparency tissue, and, in certain cases, a differently pigmented tissue will be advantageous.

In concluding these somewhat discursive remarks, I ought to add that, of all photographic processes, the carbon process is perhaps at once the most attractive, the most cleanly, and the one for which the least outlay for plant is absolutely necessary.

S. Herbert Fry.

SOFTNESS OF DEFINITION.

Your correspondent, Mr. Tulloch, evidently regards photographs very much from my own standpoint, and does not approve of blurred indistict photographs of the fuzzytype school, but I cannot altogether follow him in his query, "Do I consider that a picture must represent something, or may be a thought in black and white, or an arrangement in colour, and still be a picture?" but, if Mr. Tulloch means, Do I think that a strict representation of whatever is before the camera is *necessary*, or by some means of which I am ignorant, idealised results can be obtained different to that presented to the lens? I may say that I think that all idealism in photography must necessarily be governed by the perception of the photographer in registering just those conditions of nature that appeal to his artistic feelings at the time the negative is made, and influence him *to see a picture* where another would see nothing more than the commonplace, at least till the resulting finished photograph is submitted for criticism.

My definition of definition is that it is the true representation of objects as sharp in outline as they *naturally* appear and are represented on the ground glass of the focussing screen when accurately focussed with a good lens. I fail to see that definition could have any other meaning. Sharpness of outline is the same thing in other words. The resulting image may be *un*sharp from a technical point of view, and yet be as well defined as the subject appeared, and in this connexion I cannot altogether agree with Mr. Tulloch in that objects *always* remain in sharp outline, only deprived of colour and chiaroscuro. In an ordinary haze it undoubtedly is so, there being nothing to distort the outline, but given a heated surface, such as frequently happens in dry summer weather, the landscape will not retain its crispness of definition, but its outlines will be broken and distorted by reason of the more rarified and heated air rising from the ground and mixing with cooler strata at a greater elevation. This effect is not so noticeable in well-wooded, grassy lands; but, where there are considerable stretches of bare soil, it frequently occurs, so much so that the tremulousness of the air causes all objects to appear wavy and indistinct, and *could not* be represented with sharply defined outlines any more than rippling water could give a clean, unbroken representation of objects reflected in it.

I have already said, in my previous communication on this subject, that atmosphere, vapour, or mists, rarely did more than *flatten* the distance, and, as remarked by Mr. Tulloch, "robbed it of light, shade, and colour, but that it still remained razor-sharp," as proved by examining it with the aid of a telescope. Allowance must also be made for variation in the penetrativeness of human eyesight, which varies greatly with different individuals. What may be blurred to one may be sharp to another.

Again, Mr. Tulloch puts a question which would possibly receive a different definition from different persons. It is: "What is 'good?' Does it mean true to nature, or true to art?" I should say it means true to both, only limited by the process itself, perfect technique made conformable to art dicta. As a production, a photograph cannot be judged fairly from a purely art standpoint, or some very wretched work would pass muster. Technique must be considered as well.

We criticise the work of the painters for its mannerism, and

technique applicable to painting, which would be quite out of place applied to photography. *All* pictures to be worthy the name must be in conformity with certain canons of art, which are entirely above *any* method of expression, be it drawing, painting, engraving, or photography; if a photograph is correct in these particulars, it is, I should say, "good," no matter whether it represented near or distant objects, and of whatever character it might be, whether low in tone or brilliant in contrasts. "Good," in the abstract is, I think, defined by saying that it is the possession of such qualities, technical and artistic, as are expected by artists and experts. Any way, this is as near as I can get to it.

Some few men in the old days—that is, when wet collodion was the process chiefly used—were as venturesome in the matter of lighting as those of the present day. I remember seeing a charming effect of front light, the subject being chiefly a flock of sheep on a dusty road, with shadows projected strongly in front, by Mr. J. Hubbard, of Oxford-street, the producer of many other charming studies. Such attempts were undoubtedly rare; the difficulties attending wet-plate work in the field were such as to prevent many desirable effects being secured, not that they were not seen or appreciated, but that the means to secure them were unavailable. One could not carry a wet plate ready for exposure an unlimited time as we can dry plates. An effect being noted, most likely before the plate could be prepared the whole aspect of matters had changed, and it was only by the rarest chance unusual combinations were recorded. I do not think that *art feeling* was a whit less then than now, but the means to do it at the present time makes things more frequently done.

Formerly the impossibility of putting ideas into practice was an insuperable barrier to artistic landscape work, and very much limited the use of photography in *picture*-making out of doors. Now, however, the process has become easy —almost too easy—and the restrictions that had to be contended with no longer exist. Success almost entirely depends on the man, and not on the material, and there is no excuse for imitation effects when to secure the real thing is merely a matter of patience and judgment. EDWARD DUNMORE.

OUR ENLARGING APPARATUS AND WHAT TO DO WITH IT.

WE shall not get far advanced with our enlargements before we find ourselves at a standstill for the want of suitable cloud negatives; this brings us face to face with our second series of operations; and we shall have to make, from our original small negative, a transparency (usually) by contact.

We have already gained some experience of this, as we have made a large transparency for decorative purposes. From this, if we wish, we can, by contact printing, secure a negative of the same size, and of course—for the operations are practically similar—it does not matter whether the subject be a cloud or a landscape. Starting away, however, with the idea that we want a large negative from our small plate, we generally make, first, a small transparency by contact, and copy this up through the camera to the size required.

As these remarks are not intended for the profession, but for amateurs of "tender years," I do not think it necessary to say much of the way in which poor negatives may be "doctored up" for the purpose of obtaining large reprints; that many weak and thin and, apparently, hopeless negatives may be so treated that reproductions may be made from them, far exceeding in quality the originals, is not to be disputed. Thus, in making the slide positive or transparency, from which to obtain the large negative, we may so work the exposure and development as to get from a thin negative a strong and well-contrasted positive, or from a hard negative a much more harmonious picture, from which again, by judicious exposure and development, we can get an almost perfect negative. These items are, after all is said, more for the professional, who, in the course of business, has all sorts of original bits of work brought to him for the purpose of enlarging.

If the young amateur essays this kind of thing, it should be only in the way of experiment, and not to put, as it were, a premium on faulty and unskilful work.

Taking an enlarged negative landscape first, we do the best we can in the way of spotting, filling up with colour, and so on, any defects in the original negative, so as to get the best and cleanest positive possible. A slow plate may be chosen on which to make the transparency; this is placed face to face with the negative, and an exposure given to gaslight, which will vary somewhat as the negative is dense or thin.

A *brief* exposure to a thin and weak negative, such an exposure as will necessitate some forcing up of detail when developing the plate, is the thing to aim at in this case, or we may use a piece of yellow tinted glass between the negative and gaslight, and naturally, on this account a longer exposure, in order to get more contrast. A hard negative, on the contrary, will require an exposure to a good strong light—*full* exposure, so that we shall, by simple normal development, get and soft a harmonious transparency. The latter, for enlarging, must be very clear and full of detail, but it need not be so dense, as would look best if it were intended for a finished picture. The colour may often be improved by toning or intensifying with mercury, using, after the mercury solution, a solution of sulphite of soda to blacken the film, instead of ammonia. Plenty of washing and cleaning of the film surface must follow all the various processes to prevent staining and other faults.

It is not *necessary* to varnish the transparency, but sometimes it looks better so treated. If the back of the plate is wiped dry, and the film is perfect, we can put it in the carrier, and at once proceed to make the large negative. The operation need not be described at length; care in focussing to get a sharp picture, the lines straight, the subject evenly balanced and in the centre, and, above all, *even* illumination, are the requisites. The exposure will be, at this season of the year, and using Ilford ordinary plates, and *f*-24, say two to three minutes, rather more than less, for it is of the utmost importance not to *under*-expose; we can get no results worth looking at with an under-exposed enlargement.

During development, detail should come up at a fairly quick rate, and the plate should be fully developed certainly in five minutes. Use for developing a pyro-sulphite and ammonia developer, and expose so that the image will commence to appear in ten or fifteen seconds, with the solution at half strength. We have the plate then well under control, and, as a rule, we shall require to do nothing further than add a little more of the pyro or accelerator, as the case may be, in order to get more density to one part, or to bring forward lagging detail in another. One advantage of this developer is that we may put our fingers in it freely without risk to our cuticle, which is more than can be said of some other (but not less valuable) solutions. Sometimes the plate has had an exposure which gives, on developing, a picture which is apparently correct, but still hardly safe to fix; we do now and then get a plate which develops to a certain point, beyond which we can apparently get no further; if fixed at this stage, the result, even if intensified, will probably be hard and not quite satisfactory. Now, in a case of this kind, I find it best to wash off all mixed developers, and pour on a solution of accelerator only; this usually softens and evens up the whole picture, so that, if the negative has to be afterwards treated with mercury, the result is greatly improved.

If the subject we are enlarging is a *cloud*, the same care as regards cleanly work is more than ever necessary. Having got the best transparency possible, we put it in the carrier, and can then enlarge it on to *thin* bromide paper, or on to a glass plate—the former is the better plan—but we shall have to make the paper negatives transparent by waxing; the exposure on to the plate or paper will be shorter than when we were making the landscape negatives. We want full detail and contrast, but there must be no veil or fog from over-exposure or from forced development, or the result of densing solutions, &c. We may use the same developer (amidol) as when making bromide positives, and we must try and get full density by the action of this chemical only. Paper negatives can be more readily *reduced* than intensified; in fact, we should always be ready to use a clearing bath for such. I append two, either of which we shall find quite safe and satisfactory if used with discretion and care.

Take one ounce of ordinary fixing solution (fresh), dilute with nine ounces of water, and add two to ten drops of concentrated solution of ferridcyanide of potassium; more may be added, but the solution is a very powerful reducer. Bromide prints are, I think, always the better for a rinse in this bath before the final wash. The concentrated solution should be kept always ready. It is easily made by putting half an ounce or so of the crystals into a two-ounce bottle, and adding water to nearly fill it; then label the bottle.

We shall find frequent use for this clearing bath and reducer; our negatives will often be improved by it, and, for reducing deposit on the sky of transparencies previous to enlarging, it will be found just the thing.

Another safe and useful clearing bath is made of alum one ounce, water to make a pint, and one dram of sulphuric acid added.

The cloud (paper) negatives may be made, if several are wanted, by first making a large transparency; then, using sensitive *albumenised* paper or the P.O.P. (matt surface), print off the number of negatives desired, trying, of course, to get as good a negative image (as

regards detail and density) by toning and fixing as if it were an ordinary silver positive print.

When thoroughly dry, the above negative prints on bromide or the albumen paper are *waxed*. This waxing is more comfortably done in a warm room, and by the aid of a good fire, a piece of clean tin plate is turned up at the edges and made hot by placing bodily on the oven top or in front of the fire. A piece of good clean white wax is then pared and melted in the tin tray, the quantity required being sufficient to cover the print to be waxed; it is better to totally immerse the print, remove it, and place between folds of clean blotting-paper, and pass over it a moderately hot iron; superfluous wax is thus removed, and we get a transparent negative, which we may use in printing by contact, from either side.

Vaseline may be used for rendering the prints or negatives transparent. A coating, or several coatings of copal varnish, this, followed by a dose of vaseline, is useful, and success is to be attained in this operation only with ordinary care and patience.

Probably the amateur will find it easier, as a rule, to make his cloud negative on glass. A good plan is to make two on one plate in the following manner: Cut out a piece of thick millboard, or thin mahogany to fit accurately the half of the opening or frame in the camera, immediately in front of the dark slide. Put this screen, which should be neatly blacked, in the bottom half, and focus the cloud on the screen so that it will appear on the *upper* half of the dry plate. After an exposure, *reverse* the *negative*, readjust the wood or board screen, this time to the *upper* half of opening, so that, when an exposure is made, the image will appear on the *lower* half of the plate; the latter of course, need not be touched at all until the exposures have been made. We get on development two negatives of the cloud and, of course, both differently lighted.

I am almost convinced, looking at the matter all round, and with an experience of the methods enumerated and described, and taking into consideration skill, cost, and certainty of result, that the most practical method by which enlargements of moderate dimensions are to be made is by direct copying in the camera. I allude now particularly to enlargements from 5×4 or half-plate prints to 10×8 or 12×10.

Our enlarging camera is easily adapted or altered for copying purposes; the inner frame or partition which usually carries the lens should be perforated, so that when desired the whole length of bellows is available by merely removing the square of wood which bears that instrument, the latter being then fixed to one of the carriers in the front of the camera It is thus quite easy to get a focussing range to nearly five feet, in this way—

We have a good picture, a portrait or landscape, or a fine bit of architecture, clean, sharp, and distinct. Now, to get an enlarged reproduction of this, we can either take the negative and make a transparency, and from this a larger negative, which means two operations and attendant risks connected with each, or we can make from the small original negative direct enlargements on to bromide paper; this operation is, with care and practice, fairly easy and satisfactory; or, again, we can copy the small *print* direct on to a large plate and print copies therefrom on various sensitive papers.

Now, I feel sure that I could safely guarantee a quite satisfactory result by copying, in nine cases out of ten. I should be sorry to answer for the same proportion of plain bromide prints.

Some time ago, in the course of business, was made a contract to supply, from a series of prints of unequal size, negatives measuring 12×10. It was therefore necessary to sometimes enlarge slightly, or reduce in order to get uniform results. The charge made left no room for unnecessary losses, and everything had to be done to ensure accuracy. Although these were done at various times (which was, as a matter of fact, the hardest part of the business, the work coming in at odd times and at long or short intervals, fine days and dull), in the glass room, and now and then outside in the open air, only one out of a series of ninety-six was lost or useless, and this one not from faulty exposure, but because the lines were not parallel, an error, of course, the result of insufficient care in levelling the camera. The secret of this success, such as it was, depended I think upon the use of a lens giving the very best of definition, a rectilinear of known excellence being used, a good knowledge of the dry plate, and an invariably ample exposure.

Bearing in mind the only occasional use which an amateur may require to make of the process, and looking to the cost of working and the general good, not to say passable, results to be looked for, the balance is in favour of making a large negative directly by copying the print.

My own experience has always been that a good print, mounted and rolled smooth, will give an almost perfect copy, very often exceeding in beauty the original; that the fine grain which such a print sometimes exhibits, as when printed on P.O.P., is very far from being unpleasing, and often is a positive advantage and source of beauty; and that negatives made in this way will very often give good results when printed from with paper showing glossy surface. Not all enlarged negatives will do this.

The question is, therefore, whether to make an enlargement on bromide paper, which, after all, may not infrequently turn out a disappointment, probably only one out of a dozen exposures being up to exhibition mark, or to spend some time upon the small negative and print, and, having put the latter up in a good light, copy it to the size required, when with ordinary good luck we should get a satisfactory negative from every plate exposed—a negative, at any rate, in such condition that it only requires spotting or, at the worst, the sky blocked out to be in that category.

In the case of a copy, we make a good print, cloud and all complete, and here it may be mentioned that every care is exercised in order to secure as *perfect* a print as possible; at the same time a certain amount of latitude is at our command, as by giving a rather longer exposure, or by using a plate of greater rapidity, we can, from a hard print, get a soft and harmonious large reproduction; or by giving a normal exposure and using a strong, or, shall I say, full-strength developer, get a stronger large negative than the small one from which it was evolved. Of course, great care, but no more than should always enter into photographic operations, is necessary to secure perfect and even lighting of the print to be copied. The print may be mounted and rolled smooth, or mounted in contact with a thin glass support. It is not necessary at all times to tone and fix it, as, it being only wanted for a brief space of time, the operations may be either dispensed with entirely, or the washing of the print at all events much curtailed. Some negatives also give brilliant prints on P. O. P surfaces, the brilliancy disappearing, or being much diminished in the after-treatment, and the obvious course is to take such prints when showing at their best.

Prints which have not been toned and fixed must, however, be taken in hand promptly; put them up in a strong light, and by the time the picture is focussed and copied very considerable damage is to be expected from light action during the process, I therefore mention this as a *dernier ressort* in certain special cases. At the same time we can focus upon a toned and completed print, substituting the other at the last minute prior to making an exposure, thus greatly lessening risk of damage.

Copies and enlargements especially, after the primary difficulties of lighting and focussing have been mastered, require prolonged, or, rather, ample exposure. In some cases, where the print is itself a copy, and rather rough in the grain, or in the latter condition *without* being a copy, a little, very little, judicious "fuzziness" is to be recommended—just a faint suspicion to take off, so to speak, the rough edges, and give a uniformly soft and pleasing appearance. In such a case, if clouds are to be put in, take care that *they* are not, on the contrary, painfully sharp.

The young beginner will find it a wonderfully good experience to use his camera for copying purposes, firstly to the same or smaller sizes, then going gradually higher. He will find after a time that he is able to gauge an exposure with great accuracy, and that, if these exposures be always on the excess side, he will be able, with any reliable developer, to get a high percentage of good results.

J. Pike.

THE AMMONIUM CARBONATE DEVELOPER.*

II.

Having now placed before my readers the data which I have collected, I shall make an attempt to combine the separate items thereof in such a manner as to illustrate as clearly as possible the broad general principles which may be laid down for the guidance of those working with this developer.

In the first place, we find that, taken as a whole, the results teach us a most important fact, viz., that, when we make use of a developer containing ammonium carbonate and a restrainer, we must be prepared to devote a considerably longer time to the development than we would were we employing one of the better known developers. Taking the figures furnished by the above summary, and making a simple calculation, we find that, on an average, the development lasted for no less than twenty-nine and a half minutes.

Out of the thirteen experiments made, the minimum duration of this process was ten minutes, and the maximum sixty minutes. In only four cases did the time of development fall below twenty minutes, fifteen minutes being the amount in one case, fourteen minutes in a second, and twelve in a third.

* Concluded from page 283.

At first sight the significance of these figures may not be very apparent.

Once, however, we place them side by side with those of a series representing the rate of action of one or other of our standard developers, we cannot fail to realise the difference.

For purposes of comparison I will take the figures I have obtained for what is probably the best known of all dry-plate developers, namely, pyro and ammonia. The average duration of the process of development when this developer is employed is, I find from personal experience, 13·8 minutes; the minimum time of development, half a minute; and the maximum, forty minutes. Out of 100 plates which I developed with pyro and ammonia, in only seven per cent. of the cases did the process extend beyond twenty-four minutes. In the instances cited, the duration of the development in minutes was represented by the following figures:—

40, 40, 31, 30, 30, 25, 25.

Thus we find that the pyro and ammonia developer is more than twice as rapid in operation as the ammonium carbonate developer.

Chemically speaking, the difference seems to arise from the fact that in the one case we are employing an alkali—ammonia—in the free state, being that in which it is most capable of instantly exercising its influence on the sensitive film; whereas, in the other, we are adding this same alkali in a form in which its chemical activities lie inert, viz., in that of a salt, and from which its very gradual liberation in the free state enables us to maintain a slow but steady development.

However, the theory of the process does not concern us at present. The point to which I am directing attention is the difference in the relative rapidities of the developers.

Turning now for a moment to another subject, namely, that of exposure, I think it is pretty generally admitted by those best qualified to judge that, while over-exposure does not, of necessity, endanger the photographer's chances of success, any error in the contrary direction is absolutely fatal.

We may, then, resort to over-exposure in doubtful cases; but it is far better that we should be able to form an unerring judgment as to the absolute exposure required under any combination of circumstances which we are likely to experience.

We cannot well form such a judgment unless we agree to sacrifice speed, and make such alterations in our plan of operations as will permit of our giving longer minimum exposures—exposures, in fact, long enough to be capable of being timed with a fair degree of accuracy.

Supposing we are willing to do this, we must, along with other things, modify our developer to suit the altered circumstances. Should this—as is most likely it will—be found impracticable, there are several developers to choose from, of which the sesquicarbonate, being the slowest, seems entitled to the preference.

The foregoing experiments serve to give us an idea (not, unfortunately, so definite a one as could be desired) of the extent to which, when employing this developer, we may increase our exposures without running the risk of failure.

Regarded in this connexion, the seventh and eighth experiments are perhaps the most instructive of the series. They establish the fact that, by merely increasing the quantity of restrainer present in the developer, *we may increase the exposure of the plate to three times its normal or minimum duration without producing a negative outwardly different in appearance from one that has received a correct exposure.* Now, were we to employ a rapid developer—say, pyro and ammonia—in a case of excessive exposure, such as that in the experiment, it would be almost impossible, and, in nine cases out of ten, impracticable, for us to produce a vigorous and brilliant negative.

Then, again, there is the fourth experiment.

Here we have the data for comparing the effect produced by a short exposure *plus* a rapid developer with that due to a long exposure *plus* a slow developer. In both cases satisfactory negatives were obtained. Knowing as we do that the exposure given in the second case was no less than fifteen times as long as that which was given in the first, the results seem even more remarkable than those of the two experiments just referred to. We require, however, to look closer into the matter, otherwise we shall be likely to draw false conclusions.

In the first place, we must bear in mind that we are comparing the effects produced by two distinct developers, pyro and potassium carbonate and pyro and ammonium carbonate.

Now, the question may be put in this way. Supposing we had employed the ammonium carbonate developer in *both* cases, what would have been the normal or minimum exposure required in the first case, and how much less would it have been than three seconds, the exposure actually given in the second case? In order that we may be able to answer this question, we must first ascertain what is the average normal exposure for the slower plates that were employed in the other experiments. Excluding the two cases (experiments eight and eleven) in which the plates did not receive a normal exposure, and also the first experiment, in which the plate was selected from a different brand, the average normal exposure for the other nine experiments is found to be 5·6 seconds. When, however, I substitute the potassium-carbonate developer for the sesquicarbonate one, I find that, for the same plates, the normal exposure is reduced to one second. One-fifth of a second was found to be the normal exposure for our rapid plate when we made use of the rapid developer. Multiplying this by 5·6, we get as result 1·12 second. The answer to our problem is, therefore, as follows:—

1·12 second is the minimum or normal exposure which we should have given in the hypothetical first case, or, rather, more than two and a half times less than the exposure that was given in the second case.

So we find that, after all, the over-exposure in this experiment was really rather less than it was in the eighth experiment.

Put briefly, then, the general conclusions which we are entitled to draw in regard to the matter of exposure are these:—

1. The minimum exposure required for a plate that is to be developed with the sesquicarbonate developer is about five and a half times longer than that required for one that is to be developed with the potassium-carbonate developer.

2. This minimum may be increased to at least three times its duration without producing any variation in the quality of the image

Under certain circumstances, therefore, it will be found possible to give an exposure of about sixteen or seventeen times what would be required were we using a rapid developer.

I may mention, in passing, that pyro and ammonia is practically of the same rapidity in action as pyro and potassium carbonate.

Lastly, I may say a word or two as to rapid and so-called instantaneous exposures. It will have been seen that, in the one experiment in which a very short exposure was given, the result was a failure. The inference would seem to be that pyro and ammonium carbonate is too slow a developer for instantaneous work; but it is only fair that I should point out that the experiment in question was made towards the end of the month of November, when the light was necessarily far from strong. It must also be taken into account that the plate selected for the experiment was a comparatively slow one. Under adverse conditions like these we cannot, in justice, blame the developer when we fail to obtain a satisfactory negative.

As I am unable, for lack of sufficient data, to say more on this subject, I will leave those interested to draw their own conclusions. If, at the proper season of the year, I should have another opportunity of experimenting in this direction, any further information that may be forthcoming will be at the service of the readers of the JOURNAL.

Before concluding, I must not forget to notice a very curious property possessed by this developer. I find that, whatever may have been the exposure of the plate (provided, of course, it has not fallen below the necessary minimum), it is possible to produce a good negative by merely adjusting the proportion of *restrainer* present so as to suit the peculiar requirements of the case. There is no need whatever to alter the proportions of the other constituents of the developer; the bromide alone requires attention.

An increase in the proportion of the pyro is, in fact, likely to do more harm than good, as is well illustrated in the eighth and thirteenth experiments of the series, in which such an addition was productive of a slight excess of density.

Now, it is almost unnecessary for me to remind my readers that this behaviour is the very opposite to that of the majority of our ordinary or standard developers.

Take, for instance, pyro and ammonia. With this developer, as most of us are only too well aware, an increase in the proportion of the restrainer must be accompanied by a corresponding increase in that of the pyro, or else the certain result will be lack of density. It is quite otherwise with the ammonium-carbonate developer, and the advantage, of course, rests with the latter, on account of its greater simplicity in operation.

This advantage, along with those which have been already fully illustrated in the course of this article, should recommend it to all photographers who, in their choice of a developer, are disposed to give the preference to one that is alike slow, reliable, and simple.

MATTHEW WILSON.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

VI.

BUT very seldom indeed will it be found possible to produce negatives of black-and-white subjects of sufficient density by development alone, so that recourse has to be had to intensification of the dense

portions of the negatives, and it is at this stage as a rule that failures occur. the difficulty being to perform the operation of intensification without degrading the transparency of the film in those parts that it is imperative should be as clear as gelatine will yield.

In my last article I drew attention to the need of the closest scrutiny of the plate during development so as to be able to avoid any reduction on those parts which in the finished negative must be represented by what is termed clear glass.

When using the slow plates referred to, a much more comfortable light may be employed in the dark room during development than is permissible with plates of more exalted sensitiveness, and this, to a certain extent, enables an operator to judge more easily of the exact time when to arrest development so as to avoid any deposit on those parts that must show a clear transparent film. It very frequently happens, however, that even with the utmost precaution and closeness of scrutiny the plate will get degraded in such parts through the failure to arrest development just in the nick of time.

The instant it is seen that a plate is beginning to veil over, not a moment should be lost in at once plunging it into clean cold water, and then without delay placing it into a freshly mixed clear hypo bath. After fixing, an inspection of the plate will at once show to what an extent the development has been carried.

In some cases the veiling may be so slight as to be almost imperceptible, in fact it may be judged to be entirely free from any, and still be present in the transparent portions of the film.

It is just here that the utmost care is required, for, although no veiling over is noticeable on examination at this stage, the moment the plate reaches the after-operation of intensification it will be seen on the application of the mercuric chloride solution.

It is, therefore, a good plan, in fact, essentially necessary, to treat all negatives without exception to a slight reduction, so as to make absolutely certain that no degradation will occur when the mercuric chloride is applied at the intensification stage.

Of the numerous reducing methods, perhaps none is better, if indeed equal to Mr. Farmer's formulæ, or, as it is better known, the ferricyanide method. I have, however, met those who say they never could work it with certainty.

These complaints, however, were always based on ignorance of how to set about the operation properly, the general fault being a liability to carry the reduction too far.

Such objections, however, are entirely groundless, and arise, as I have said, from ignorance of the proper manner of using the reducing bath.

Should any readers of THE BRITISH JOURNAL OF PHOTOGRAPHY have experienced a similar difficulty in using ferricyanide, I would suggest them trying it in the following simple manner.

First of all, let them provide themselves with a suitable subject to reduce, and perhaps there is none better than a lantern transparency in which the high lights have become degraded by reason of carrying the development too far.

After such is thoroughly well washed and soaked in clean cold water, place in a deep porcelain dish of suitable size to the plate being reduced, a small quantity of clean cold water, say about four ounces for a small size dish; into this pour half an ounce of a clean saturated solution of fresh hypo, and then drop into one corner of the dish a small crystal of ferricyanide of potassium, in size about as large as a pea; now place the plate into this, and continue to rock the dish steadily, so that the gradually dissolving crystal will be equally mixed throughout the solution and flow evenly over the plate. For a minute or so no reduction will take place, but after that time it will be seen that a beautifully slow and regular action of reduction is taking place, during which the plate should be frequently lifted out and plunged into a bath of clean cold water kept at hand, this will enable the plate being carefully scrutinised every few seconds, so as to judge of the exact moment to arrest any further action of reduction.

By adopting this simple plan, over-reduction never need occur, and the action is well under control, for the plate is placed in a bath that gradually gains increasing strength, and thereby it is seen, the moment the reduction begins to take place, how such progresses.

By another very simple little plan local reduction may be affected, for it happens sometimes that, through errors or uneven lighting, a plate shows on development more density on one side than the other.

To deal effectually with a case of this kind, let the same reducing bath be prepared and the negative in the same way; only, after the first dip just when the crystal of ferricyanide begins to dissolve, let the solution be applied to those parts of the film it is desired to reduce by means of a plug of cotton-wool; and a very convenient way to do this is to get a short piece of glass tubing about three inches long, run a double string down it, like hauling a cork out of a bottle and when the double end gets through insert a good tuft of cotton-wool, and by means of the string pull this firmly up the tube; this makes a capital swab, and a few of such are always handy on a developing bench.

By means of this cotton swab the ferricyanide solution is swabbed on and off, and the plate, after each application, dipped into clean water. By this means any irregularities in densities are easily put right.

The operation of reducing over-density or clearing transparent parts from deposits of silver is really a very simple one, and failures need never occur if gone about in the manner I have described.

When it is seen that the transparent portions of a black-and-white negative are entirely free from any deposit, the plate must receive a most thorough washing before intensification is attempted, there must be no hurrying at this stage; after which the plate is immersed in a saturated solution of chloride of mercury to each ten ounces of which a teaspoonful of chloride of sodium is added.

When this is applied to the plate, it will be at once seen if the reduction has been sufficient; if it has been, the transparent portions of the negative will retain their clearness; if otherwise, they will veil over, and, when the plate is thoroughly washed and its surface sponged lightly with clean cotton-wool, the negative is immersed in a strong solution of ammonia about one to six: this will blacken right through to the back, but leave the transparent parts beautifully clear if all the operations have been carefully performed.

By this means black-and-white negatives may be produced having sufficient contrast for the production of process blocks of line subjects or any other kind of printing in photography.

It is not only, however, in pure black-and-white working that such negatives are of value.

An operator is frequently called upon to copy old or faded documents, in which case the desire is to produce an almost facsimile of the original both as regards the size and colour of paper, with every little spot or discolouration being preserved in the copy exactly as they appear in the original. In this kind of work the main object is, first of all, to produce a negative with sufficient contrast to yield vigour in the blacks when printed without degrading the whites.

The colour of the resulting print is not obtained by any method of printing, but by the application to the toned and finished print of a suitable dye according to the exact tint of the original.

Old and faded documents are easily imitated, however, in the matter of colour; such subjects are best printed on matt-surface paper of a similar texture to the original, and these are easily procured and in some cases salted and sensitised specially in the manner described by me in a former article when treating on the subject. The main thing is to get a negative that will yield a black-and-white print; after such is toned and dried a strong solution of tea is prepared, and the print soaked in this until the desired tint is attained. There are many other dyes that may be used, but I have seldom ever needed to go beyond the application of a solution of common tea or coffee, which seems specially suited to the production of brown and brownish-yellow tints.

T. N. ARMSTRONG.

Our Editorial Table.

"IMPERIAL" FLASHLIGHT PLATES.

WE have tried a packet of plates bearing the brand "Flashlight," implying a high degree of sensitiveness. Our trials of them were made not by flashlight, but by ordinary daylight; but from these we are enabled to testify to their great sensitiveness and their producing clean and otherwise good negatives even under protracted development.

REMBRANDT PHOTOGRAVURES.

Marion & Co.

HITHERTO so many of our best photogravures have been made on the Continent that it is a source of gratification to find work of equal merit and at comparatively low prices now being produced in our own country. Of this the series above mentioned affords ample proof. In catering for photographers, and not for them alone but for the public, Marion & Co. appear determined to show themselves as not being second to any in the reproduction of art photographs by the agency of photogravure. The series already published comprise six in the meantime, more being soon to be added. The negatives are by Messrs. Downey, and the pictures are respectively entitled *The Lost Chord, The Sisters, Nydia, Forsaken, The Lily,* and

Luna. The sizes of the prints are 11½ × 8½, the plate paper on which they are made being 22 × 15, and the price 2*s.* 6*d.* each. These, or a selection from them, would prove very attractive in the reception room. The tone is rich and warm.

The Practical Photographer's First Handbook.

By Matthew Surface. Percy Lund & Co., Bradford.

This *brochure*, of which this is the eighth edition, is stated to have been entirely rewritten. Its teachings are sound and practical, and it is simple enough to be placed in the hands of the veriest tyro with a fair expectation of his being able, without any other mentor, to take a negative and make a print from it. It contains several illustrations, in some of which defects in composition are pointed out. Price 6*d.*

Process Work Year-book.

Penrose & Co., 8, Upper Baker-street, Clerkenwell.

To those interested in process work this annual is deserving of the highest commendation on account of the great variety and beauty of the numerous illustrations it contains, and the eminently practical nature of the literary portion, which has been contributed by men who have in a greater or less degree made a study of special phases of process work. Not the least valuable portion of the *Year-book* is a comprehensive catalogue of all the requirements for practising every kind of photo-mechanical processes. By the publication of the volume, Messrs. Penrose & Co. place a large section of the photographic community under obligation to them. Price, 1*s.*

News and Notes.

The Paget Prize Plate Company, Watford, are introducing a collodio-chloride paper, coated on specially prepared paper.

Mr. Lindsay Hemery has removed to Tavistock House, Brockley-road, S.E., the growth of the enlarging and other departments of his business necessitating the change to more convenient premises.

Mr. H. Jasper Redfern, who for many years was employed in the establishment of Messrs. W. Watson & Sons, 313, High Holborn, has commenced business on his own account as an optical and photographic dealer at 55, Surrey-street, Sheffield. He will also act as Messrs. Watson's agent. Mr. Redfern's business and photographic abilities entitle him to expect success, and we hope he will experience it.

A photographic method of determining the true position of the pole is stated to have been discovered by Camille Flammarion, the well-known astronomer. It consists in exposing a camera to the night sky, and allowing the circumpolar stars to describe their movements on the fixed plate. At the pole, says M. Flammarion, the stars will describe circles round the celestial pole or imaginary prolongation of the earth's axis to the zenith.

We are informed that the Birkenhead Photographic Association, after a useful, and, until recently, a prosperous career, extending over a period of ten years, was officially wound up on April 30, 1895. Those responsible for its management attribute its failure to the superior advantages offered by their neighbours, the Liverpool Photographic Association. It is satisfactory to record that the stoppage has not been due to financial difficulties, and that the closing of their accounts has resulted in a balance in hand of £1 10*s.*, which was unanimously voted to that excellent charity, the Photographers' Benevolent Association.

Eastbourne Photographic Society's Exhibition.—Competitive Division.—The following were the awards:—Open Classes—(Class I. Champion), gold medal, withheld; silver medal, J. Kidson Taylor; bronze medal, F. Whaley. (Class II., Landscape and Marine), gold medal, withheld; silver medal, Charles Job; bronze medal, W. Thomas. (Class III., Portraiture), silver medal, S. N. Bhedwar; bronze medal, Percy Lankester. (Class IV., Hand Camera), silver medal, withheld; bronze medal, Ed. J. Bedford. (Class V., Lantern Slides), silver medal, E. Dockree; bronze medal, Paul Martin. (Classes VI. and VII.), no award. Members' Classes—(Class A, Landscape), silver medal, witheld; bronze medal, W. Sparrow. (Class B), no award. (Class C, Lantern Slides), silver medal, H. Habgood; bronze medal, Rev. H. G. Jameson. Special gold medal for best exhibit, E. Kelsey. Messrs. F. P. Cembrano, jun., J. Gale, and Andrew Pringle were the Judges.

International Photographic Exhibition at Salzburg, Austria, 1895.—An International Photographic Exhibition will be held, under the distinguished patronage of his Royal and Imperial Highness the Grand Duke of Toscana, in the Marble Halls of the Mirabell Schloss, Salzburg, between August 1 and September 15, 1895, under the joint auspices of the German and Austrian Alpine Club and the Salzburg Amateur Photographic Society. The Exhibition will be open to amateurs and professionals, and the pictures should be landscapes depicting mountain scenery in all parts of the world, as well as picturesque, local and national costumes, scenes and representations of ethnographic interest. His Royal and Imperial Highness (the illustrious patron) and the German and Austrian Alpine Club have presented gold, silver, and bronze medals, which will be awarded to the successful exhibitors. Diplomas will also be given. Full particulars and application forms may be obtained from the Exhibition Committee, Sternbrau, Salzburg, Austria; or at the offices of the "International," 1, Church-row, Fenchurch-street, London, E.C.

The South London Photographic Society have altered their rules to permit of their seventh annual Exhibition being held in the month of February or March, 1896, instead of November, 1895, to avoid the block of Exhibitions which usually occurs in the latter part of each year.

Royal Photographic Society.—Ordinary Meeting, Tuesday, May 14, at 8 p.m., at 50, Great Russell-street, W.C.—*The Cyclograph*, with illustrations, by Mr. A. H. Smith. *The Changes that Platinum Prints are liable to (Apparent Fading and certain Toning Processes)*, by Mr. Chapman Jones.

Photography and Shakespeare.—During the recent Shakespeare commemoration week a crowded audience assembled at the Walker Art Gallery, Liverpool, to hear Mr. Geo. E. Thompson lecture on *The Swan of Avon*. Mr. Thompson's reputation as a photographer and artist was amply sustained by the beautiful series of lantern pictures he submitted. The first series illustrated Stratford with its many historical landmarks. The second part was devoted to the exhibition on the screen of a number of Shakesperian characters from life, prominent amongst which were a set of Miss Ellen Terry in the many characters with which she has associated herself. The services of Mr. T. Herbert Kendrick had been secured to render suitable excerpts from the poet's works, whilst his own portraits in the characters of Shylock and Othello were exhibited. Though Othello's Defence was delivered with power and grace, Mr. Kendrick was seen at his best in the scenes from *The Merchant of Venice*, his Shylock being a most capable presentment of the wily Jew. During the evening songs from the plays were admirably rendered by Mr. Thomas Barlow and Madame Mildred Scarlette. The lecture was the most successful of the series, which it concludes, and it is to be hoped that the Committee of the Art Gallery will be induced to make it an annual event, and so, in a small measure, help to keep green the memory of England's immortal bard.—*The Stage.*

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 8480.—"A Back for Picture Frames with Adjustable Strut to Stand in Upright or Oblong Position, or at any given Angle." A. Rawlings.—*Dated May*, 1895.

No. 8628.—"Improvements in Photographic Cameras." G. Chappell.—*Dated May*, 1895.

No. 8638.—"Improvements in Adjustable Frames and Mounts for Pictures, Photographic Slides, and like Purposes." H. Sanford-Burton.—*Dated May*, 1895.

No. 8656.—"An Improved Photographic Negative-marker." H. Weld-Blundell.—*Dated May*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
13	Camera Club	
13	Norfolk and Norwich	
13	North Middlesex	*Photographing Minute Objects by Means of the Microscope.* T. E. Freshwater.
13	Richmond	
14	Birmingham Photo. Society	Exhibition of Prize and other Negatives.
14	Hackney	
14	Manchester Amateur	
14	Paisley	
14	Royal Photographic Society	*The Cyclograph.* A. H. Smith.—*The Changes that Platinum Prints are Liable to (Apparent Fading and certain Toning Processes).* Chapman Jones.
14	Stockton	
15	Brechin	
15	Bury	
15	Leytonstone	
15	Manchester Camera Club	
15	Photographic Club	*Photography and Cycling.* W. D. Welford.
15	Southport	
15	Southsea	
16	Birmingham Photo. Society	
16	Camera Club	
16	Glossop Dale	
16	Hull	
16	London and Provincial	*Panoramic Photography.* J. Traill Taylor.
16	Oldham	
16	Oxford Photo. Society	
17	Cardiff	
17	Croydon Microscopical	
17	Holborn	
17	Leamington	
17	Maidstone	
17	North Kent	
18	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 2,—Mr. A. L. Henderson in the chair.

Messrs. Penrose & Co. presented their *Process Work Year-book* to the Library.

The Hon. Secretary drew attention to the trouble he experienced in collecting members' subscriptions, some recent notices by post having produced very few replies. This, he thought, was very hard on the Hon. Secretary, and not as it should be, as trouble was given and postage wasted.

Messrs. R. BECKETT, J. E. HOOD, and T. E. FRESHWATER also spoke, sympathising with the Hon. Secretary.

It having been suggested that defaulters' names be posted in the room, eventually it was moved and seconded to refer the matter to the Committee.

The CHAIRMAN stated that, being dissatisfied with a lens used in his lantern, he had ordered of Messrs. Swift one of their correctors for flattening the field. This would be ready in a week or two, when he would report upon it.

A question from the box was read: "Why is it that a gelatino-chloride print, after being toned right through to a deep purple and properly washed, turns a nasty brown colour and loses both density and detail on being placed in the hypo (three ounces to twenty ounces of water)?"

The CHAIRMAN thought it a question of imperfect fixing. This could be discovered by applying mechanical friction to the surface, when the tone would be removed. He gave the following formula for toning Lumière's "Citos" paper:—

Solution No. 1.

Lead nitrate	1 drachm.
Lead acetate	1 ,,
Alum	2 drachms.
Water	20 ounces.

Solution No. 2.

Hypo	2 ounces.
Water	10 ,,

Mix the two solutions, add a trace of formic acid, and half a grain of gold chloride gradually.

The CHAIRMAN, having been asked by Mr. Debenham what was the use of the lead, said that he did not know for certain. He also stated that, if the paper were required white, sulphite of soda would discharge the colour as sold. Speaking of printing on gelatino-chloride paper, he said that there was a great deal of difference with it in damp weather than when it was in a "bone dry" state. He wondered why makers did not issue papers suitable to several classes of negatives.

Mr. W. COLES having stated that paper had been found to adhere to collodio-chloride negatives,

The CHAIRMAN said that one part beeswax and one part paraffin wax boiled together and skimmed clear would prevent this.

Mr. COLES had used a weakened retouching medium with success, and Messrs. R. Beckett and Bayston agreed as to the use of a medium for this purpose.

Mr. J. E. HODD had treated two prints (on different makes of paper) to the same toning bath, and asked why one retained the purple tone whilst the other deteriorated.

Mr. R. BECKETT considered the bath used was only suitable for one of the papers used.

The CHAIRMAN suggested as a useful addition to the fixing bath two grains per ounce of potassium cyanide.

PHOTOGRAPHIC CLUB.

MAY 1,—Mr. F. A. Bridge in the chair.

Mr. GOTZ showed two 9×12 cm. plates, which he had exposed and developed for bromide plates. Had used amidol, and was surprised at result. Had left in developer all night because he could get nothing out of them in half an hour. Result was a positive one.

The CHAIRMAN said that they had the appearance of being collodion plates.

Mr. MACKIE said the appearance was the same as would be obtained on a gelatine surface left in developer all night.

The opinion of Mr. CLIFTON was that they were transparency plates, and should have been treated accordingly.

Mr. FRY thought it was a case of under-exposure, and not that it was a plate prepared with a recognised transparency formula. Moreover, probably no other developer but amidol would have brought out an image at all.

The CHAIRMAN then called upon Mr. S. H. FRY for his paper, *Carbon Transparencies* [see page 295].

Mr. FOXLEE did not quite agree with one remark of Mr. Fry's, and that was that he did not use a fresh bath every time.

Mr. FRY re-read the paragraph referred to, adding that one of the greatest curses in photography was the use of old solutions.

Mr. FOXLEE would recommend Mr. Fry not to use golden syrup in the process, as it is a most indefinite product. If he wants to add saccharine matter, he should use best loaf sugar. Mr. Foxlee, if wanting a transfer with great contrast, printed very deeply, and used water too hot to bear the fingers in.

Mr. MACKIE said he had not noticed that Mr. Fry had said whether his bath was neutral, alkaline, or acid.

Mr. FRY said that, if he found his tissue at all acid, he would neutralise it. But he did not attach so much importance to that; it was obviated by using a fresh bath each time.

Mr. HOOD said that his great bugbear was reticulation.

Mr. FRY said that that would be caused by an excess of gelatine coating on the plate. Coignett's gold medal was an excellent one.

Mr. WILLIAMS said he did not use a substratum at all. He rubbered the edges of the plates and collodionised the tissue.

Mr. CLIFTON said he had had a splendid example of reticulation on a plain glass. He had also found that red chalk tissue would not keep so long as others.

Mr. WEIR BROWN asked if the resulting enlarged negative depended more or less on the colour of the pigment used for the transparency.

Both Mr. FRY and Mr. WILLIAMS said yes, as would be seen by the grain of the transparencies shown. The blue or the green gave the best contrasts.

Croydon Microscopical and Natural History Club (Photographic Section).—April 23, Mr. W. Murton Holmes occupied the chair.—Mr. ERNEST STRAKER'S subject was *Fair Isle Scenes, and Fair Isle Folk*, which was illustrated by slides from negatives taken by himself. An additional interest arose from the fact that these views are believed to be the first ever taken. Fair Isle, lying as it does to the extreme north of Scotland, about midway between the Orkney and Shetland Islands, is, with the exception of St. Kilda, the most isolated of the British islands, being twenty-two miles from the nearest land, and its inhabitants are, owing to this isolation, a most interesting community. They are Norwegians in origin, but speak English. The landing is difficult, owing to the very rocky nature of the coast and the strong tide. The only regular communication is by means of a smack, which carries the mails once a fortnight, and the only accommodation on the island is by the courtesy of the postmaster. One view shows a small sailing boat, which acts as a floating shop, carrying goods for sale, while another gives a view of the south lighthouse, taken after dark, with four minutes' exposure, showing the light in the tower at the brightest points. We then pass on to the ruins of a watch tower and beacon, erected on the summit of a bold promontory, Malcolm's Head, at the time of the great French war, to give warning of the approach of any hostile fleet. The inhabitants number 213, the men are fishermen, while the women do most of the farming work. Two slides illustrate the bringing home of the old peats in ox-carts from the moorland, this work being done at night, as the oxen will not work in the daytime on account of the heat. We then pass on to illustrate the primitive mills, with horizontal water wheels, which drive the small millstones direct, without the intervention of any mill work. The following slides will show how the Fair Islanders take advantage of every rock having grass upon it—the Sheep Craig—a bold island rising some four hundred feet above the level of the sea. In the spring they scale the cliff by means of a chain fastened to the rock, and then haul up some sixty sheep to pasture there till the autumn. Another view shows a still more inaccessible rock on the west coast, the summit of which is inclined at a great angle, on which a few sheep are placed. We now pass to a characteristic group of fishermen, where we see the curious hide shoes in actual wear, while another slide shows the shoes (called Rivlins) themselves. They are made from raw hides with the hair on, and are a survival of the most primitive form of foot gear. The fishing fleet, consisting of ten boats, and the curing grounds for the fish, form the subject of the next slides. These boats, peculiar to Fair Isle, are extremely light and handy, and by means of them the islanders are able to pass through the strong-tide races—called roosts. They are modelled on the plan of the old Viking boats, and carry, in fair weather, a sail which is very large in proportion to their size. Although so small, they are capable of carrying up to two tons each of the saithe—*Gadus carbonarius*—the chief fish they catch. This fish is very abundant, and it is also caught in a half-grown state, when it is called a piltock. The first are salted, and then laid out to dry in the sun. Cod-liver oil (so called) is made from the livers in a very primitive manner. Great numbers of gulls assemble to feed on the refuse fish, especially on one remarkable rock, which is pierced by three caves which meet in the centre. We now pass on to a series of views illustrating the marvellous rock scenery of the west coast, the cliffs of which, rising at their highest to six hundred feet, are cut into countless peaks and needles called "stacks," and are worn into many deep sea caves. The north end of the island, where the north light is placed, is a favourite haunt of seals, where may be seen from the cliffs above the rare sight of these interesting and shy animals playing, fighting, and sleeping in the sun. They are of all shades from nearly white to black, and one specimen seen was at least twelve feet in length. The next slide shows the place where the German emigrant ship, *Lessing*, with four hundred emigrants on board, was wrecked by running into a cleft in the rock, and who were rescued by a Fair Islander named Alexander Eunson, who took them off two or three at a time in his boat through a small tunnel in the cliff. The same slide also shows where a ship of the Spanish Armada, *El Gran Griffon*, was wrecked in 1588. The crew and soldiers, although many were drowned, for the most part got to land, and in a short time consumed all the provisions on the island, eating even the ponies. The exasperated islanders killed numbers of them by stratagem, some by taking them in a boat to a cove called the Hole of Reeva, under the pretence of showing them the last cow on the island. Leaving them there on the narrow beach, they returned to the summit and hurled down rocks on the unfortunate Spaniards until none were left alive. The Spaniards have left traces of their sojourn even down to the present time in the distinct traces of Spanish blood among the people, and in the Oriental patterns and colouring of the Fair Island knitting, as may be seen in the two concluding slides. The lantern was under the management of Mr. J. H. Baldock.

FORTHCOMING EXHIBITIONS.

1895.		
May 10, 11	*Birmingham.	C. J. Fowler, 2, High-street, Birmingham.
June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

CARBONATE OF POTASH *VERSUS* CAUSTIC POTASH.

To the EDITOR.

SIR,—A friend, who is a practical photographer of great experience, lately asserted so strongly the advantages of caustic potash in the developer over the carbonate (maintaining that it required only half the exposure), that I have been giving it a careful trial at the expense of nearly a dozen half-plates, which I exposed in pairs, developing one with quinol developer and carbonate, and the other with identical solution, except for the substitution of caustic potash for the carbonate. The

exposures were reduced to one-fifth of a second, aperture *f*-64, made with a Bausch and Lomb Iris shutter, on a subject with deep shadow, so that the utmost power of the developer should be exhausted, and the development was made simultaneously and pushed to the appearance of fog. The development with the caustic potash was more rapid, and the amount of the alkali required was about one-third of that of the carbonate, but the final result showed no advantage of one over the other. The action of the caustic potash was considerably more rapid, reaching the utmost point of development in about half the time required for the carbonate; but beyond this doubtful superiority there is no gain in using the caustic alkali.—I am, yours, &c., W. J. STILLMAN.

Rome, April, 30 1895.

THE SIZES OF PLATES AND PAPER.

To the EDITOR.

SIR,—I have read with interest the letter of Mr. Bolton in your issue of the 26th ult. May I suggest the advisability of adapting for the "favoured or selected" sizes those which, whilst capable of easier subdivision, would still retain as near an approach as possible to the existing sizes. The following would, I think, meet all requirements, and have the advantage of dispensing with fractional parts of an inch, easy of subdivision by simply cutting any plate in two or more equal parts without waste. The sizes are obtained by doubling the narrow side of previous plate, and retaining the longer side, and are as near existing sizes as possible; the 12×8 is only two inches longer than the 10×8, and two inches narrower than 12×10, consequently can well replace these two; the other sizes are near enough for all practical purposes. The price should also be regulated by the area of the plate, say, 1*d.* per square inch per dozen up to 16×12 as follows:—

		s.	d.
$4 \times 3 =$	12 inches at 1*d.* =	1	0
$6 \times 4 =$	24 ,,	2	0
$8 \times 6 =$	48 ,,	4	0
$12 \times 8 =$	96 ,,	8	0
$16 \times 12 =$	192 ,,	16	0

Compare these with the popular prices, and you will perceive that the difference is trifling and better balanced.

It is not my intention to enter into a discussion relative to the merits of this suggestion, having no time at my disposal, but simply offer it for what it is worth.—I am, yours, &c., A. J. BOULLIER.

2, *Victoria-crescent, Jersey, May* 2, 1895.

A WARNING.

To the EDITOR.

SIR,—I am a bricklayer; Bert, my eldest boy, being an amateur photographer; I see your JOURNAL continually.

Amongst other interesting matter, I have read the letters concerning "sweating," "hard cases," employers offering 12*s.* 6*d.* per week salary, and getting thirty-one applications. I read also that there is not enough spirit amongst assistants even to form a union to expose "sweating," not even enough spirit to keep their own "Benevolent" from failing.

Now, I have read these letters with very mixed feelings—gratitude and contempt. Gratitude, because my boy, who seemed bent on being a gentleman—and turning photographer, instead of being an honest, independent artisan like his father—can now see what he is rushing into. Contempt, for those who allow themselves to sink to such a depth of degradation as to submit to such treatment as detailed in your pages.

A bricklayer can earn 9*d.* and 9½*d.* an hour; when Saturday mid-day comes, he is his own master, and can go off with his wife for the afternoon, while the next day also is at his own disposal. If our boss were to tell any of our hands to work Sunday, they would at once leave; if our screw got docked in the way of a fine, when pay time came there would be a disturbance. I can fancy a firm advertising for a bricklayer to work seven days a week, and offering to pay him in food and lodging, and a little pocket money—what a brilliant prospect for a young man. Would there be thirty-one applications? hardly. No, a firm that issued such an advertisment would become a laughing-stock throughout the trade.

In conclusion, I would say to these young fellows who are "starving," and complaining, Help yourselves, come out of it; don't have such infernal ideas as to what constitutes respectability, be men; be more ashamed of a white liver than a red hand; and, if you still remain in the mire, I say, Serve you right, you deserve all you get, because you will not help yourselves.

Apologising for thus intruding my opinions, being an outsider,—I am, yours, &c., WILLIAM HIGGINGS.

ANOTHER HARD CASE.

To the EDITOR.

SIR,—Having been the fortunate applicant for a seven-days-a-week situation, advertised in a London paper, a recital of my first and last week's experience may amuse, if not instruct, and perhaps also afford a little consolation to the (no doubt) numerous applicants who probably sent their specimens, cards of self, &c., and have since been bemoaning their ill luck in not securing the prize. Briefly, then, being in the immediate locality of the studio when the advertisement appeared, I called personally on the advertiser, whom I found to be a most effusive and promising individual. I had no specimens, but my testimonials from recent employers were quite enough for him.

"When could I come?"

(I had been out three months. This may explain why I ever applied.) I said, "At once."

Next day he telegraphed, "Come at once."

Accordingly I started on the Sunday business, commencing very fairly about 12 o'clock, and a good few negatives were taken by himself. But even at this stage I was struck by one or two circumstances which seemed a little strange, *e.g.*, nearly every sitter expressed the hope that it would be all right this time. Later on, I discovered that they had all been previously "dummied." The battered and delapidated conditions of camera and lens, and especially the stand, which would neither raise nor lower; the absence of water in the dark room—the end of a cut pipe in the sink being the only evidence of it ever having been there; the stock of chemicals represented by a galaxy of empty and dirty bottles, were all subjects of reflection to me. But I had started, and would not give in without a fair try. On the Monday I was left to my own resources, my principal having left on Sunday night for another branch. I was not harassed with many sitters, my principal work being to make three copy negatives, as best I could, without copying board or any of the usual facilities. Between two and three o'clock a plate with three cold potatoes and a microscopic piece of meat was brought up and placed upon the table. After a little consideration I came to the conclusion that this must be dinner. Having swallowed it, I found that I had gained an excellent appetite, which compelled me to adjourn to the nearest cook-shop for a decent meal. Tea, consisting of one small cup and one slice of bread and margarine, was duly sent up about five o'clock. This day's board was a fair sample of what followed the next five. At night, I was told that the bedroom I was to occupy was not ready, and, on one pretence or another, it was not got ready all the week.

I will not dwell on the misery of printing with broken frames; toning, fixing, &c., with one dirty dish; but come at once to the grand finale.

Seven p.m., Saturday. "Oh, Mr. B.," said the lady, "I think that you may close the studio. And—Mr. —— has not come home yet—I am short of money. Here is 7*s.* 6*d.*, and you will get the rest on Monday."

I was not surprised and did not express it, but simply said "that would scarcely suit me."

"Well, then, you must come on Monday, and see Mr. —— himself," she said.

On Monday I went at noon, but Mr. —— had gone out; at three p.m. Mr. —— was still out. At six p.m. Mr. —— was in, but engaged: "Could I call back in a quarter of an hour?"

I called back in a quarter of an hour, and found that Mr. —— had just gone out again, and I was told to come and see him in the morning. But, being determined to see him, I said that I would wait. I did so, and after some time, enter Mr. ——, with two friends, a big cigar in his mouth, a strong if not agreeable aroma of beer exhaling from him. He at once saluted Mr. B. with the cheery exclamation, "Well! what the d—— do you want? What are you hanging about here for?"

I mildly observed that I imagined that he knew my business.

"Oh! that was it—was it? He would soon pay me my——"

What followed, must be imagined—a tussle, three to one, out of which I was glad to get any how, and with my face and neck bleeding. I went to the nearest police station, and reported the whole case. I was then advised to go to a magistrate in the morning. On doing so I was told that it was simply a case for the County Court, and could not be dealt with summarily, a photographer not being a workman in the usual sense. And there the matter rests. The County Court does not sit for several weeks; meanwhile I am idle, without means to stay in London and prosecute the case, and so there is a chance of this man getting off with impunity.—I am, yours, &c., GEO. BROWN.

409, *East India Dock-road, E.*

PROCESS WORK AT THE SUMMER PHOTOGRAPHIC EXHIBITION.

To the EDITOR.

SIR,—Will you kindly spare me space to draw the attention of process workers to the special class devoted to that branch at the above Exhibition? The only restriction is that the reproduction shall be of a negative from nature (not a copy of a picture, &c.), and silver and bronze medals are offered for the best results. It is not often that such a class is included in the list, and that must be my excuse for endeavouring to make it successful, by calling attention to it.—I am, your, &c.,

59 *&* 60, *Chancery Lane, W.C.* WALTER D. WELFORD,
General Manager.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—According to notice in your last, I attended at the White Swan, Tudor-street, Whitefriars, and waited till nine o'clock p.m., but no one turned up; can this apathy be accounted for? I know the time of year is unpropitious for indoor meetings, but, amongst the hundreds of assistants, surely there are some that could have made it convenient to attend. Perhaps the reason is that present-day assistants do not know that it was at my house and at my invitation twenty-two years ago that the Photographers' Benevolent Association was started. I was the Secretary till 1876, since which time I have been away from London till now, and, seeing the probability of the Association collapsing, I made the trial to ascertain if photographers' assistants really were so apathetic as to allow the Association to die. Whether I repeat the experiment will depend upon "Correspondence" column of the BRITISH JOURNAL OF PHOTOGRAPHY during the next few weeks.—I am, sir, yours, &c.,

W. T. WILKINSON.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted interior background in new condition in exchange for exterior background. Photographs exchanged.—Address, J. HUFF & SON, Maryport.

Will exchange studio stand or burnisher (six and a half inch) for 8×8 exterior (trees) background. Difference adjusted.—Address, C. SPENCE'S Studio, Dunbar, Scotland.

Entrekin's Eureka burnisher wanted in exchange for Marion's five-guinea embossing press and dies, as new; also, exchange safety bicycle for hand camera, Adams's preferred.—Address, W. WALKER, Scotholme, Nottingham.

Will exchange two No. 3 Darlot lenses, in perfect working order (splendid lens for ferrotype work), for a full-plate, whole-plate, wide-angle by Lancaster, or other good make.—Address, JOSEPH SPAVIN, New Brumby, *vid* Doncaster.

Will exchange new exterior background for interior, 10×8 or 8×8, second hand, if in good order. Also new graduated background, 8½×6½, exchange for seascape or interior. Must be in good condition.—Address, N. HUNTER, Port Glasgow.

Will exchange Rayment camera, 15×12, practically new, with three double slides and solid leather case (name requires removal), and R. & J. Beck lens for above, iris diaphragm, for Stereoscopic Company's binocular camera, either size, with Zeiss lens.—Address, J. COCKBURN, Glencorse House, Milton Bridge, Midlothian.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Thomas Bourke, Perth.—*Two portraits of Robert Wallace, Q.C.*

John Stuart, Glasgow.—*Portrait of the Rev. John Lindsay, of Helensburgh.*

John Horsburgh, Edinburgh.—*Two portraits of Professor H. C. Goodhart, M.A., Edinburgh University.*

Francis Coghlan, Londonderry.—*Two portraits each of Rev. Hugh Boyle, C.C.; Rev. Hugh McNeuiman, C.C., and Rev. Joseph McKeefery, C.C.*

H. C.—The initials on the lens are not those of the person named.

A. L. M.—We should think that the permanency of the negatives would not be endangered.

EMPLOYER.—Unless the indentures are stamped, they are not binding on either side. The apprentice is but an *employé*.

SAVOIR.—*Le Moniteur de la Photographie* is the best-known French photographic paper. The editor is M. Léon Vidal, 7, Rue Scheffer, Paris.

H. T. LAWSON.—The quarter-plate portrait combination mentioned will prove much more useful for enlarging than the wide-angle one you have been using.

LENSES (Newport Pagnell).—Test the lenses by ascertaining how much they cover, and which of them gives the sharpest marginal definition with a definite size of stop.

J. A. W.—We cannot say if a second and revised up-to-date edition of the work will be published or not. Why do you not write to the publishers? They will give you the desired information.

HANTS.—The "snap-shot" picture containing the Royal personages is interesting, but we should surmise it has no commercial value, and we can suggest no way in which you can realise upon it.

A. Z.—1. Fix the mirror, outside the window, at an angle of 45°. 2. Of course the enlargements can be made on dry plates as well as on bromide paper. 3. The same arrangement will serve for either.

W. E. A. D.—In the ALMANAC for 1887, you will find in the article on Stereoscopic Photography a description of a method for cutting stereoscopic negatives, which will give you the necessary information.

W. J. BENNETTS.—The sketch shows a good form of studio so far as we can judge from it, seeing that the aspect is not given. We may say, however, that, in actual practice, a little greater length would often be found an advantage, as in taking groups.

S. HARRIS.—Evidently too much alcohol has been added to the solution of gelatine, hence the precipitation. Some samples of gelatine will bear the addition of a larger proportion of spirit to their solutions than will others. For mounting purposes, choose those that will bear a large addition.

T. WALTHEWS.—A hydrometer with Beaumé's scale, such as is usually quoted when the strength of the perchloride of iron etching for photogravure is given, may be obtained from any of the dealers in chemical apparatus. No special hydrometer is made for the purpose, nor is one in any way necessary.

R. BILLING.—1. The formu'æ, as given in the ALMANAC, for orthochromatising plates are amongst the best that have been published. 2. The ordinary hypo fixing bath is all that is required. 3. The pink tint can be removed by prolonged washing, but, if a slight amount of it remains, it will do no harm.

SIMCO.—If the starch is of good quality, it will not cause the prints to fade. We suspect that yon must look for some other source for the fading than the best-quality starch. There is no reason why that mountant should cause gelatine prints to fade quicker than albumen ones, notwithstanding what you have been told to the contrary.

S. H. C. complains that the brand of double-albumenised paper he is now using gives him a great deal of trouble, "owing to the prints curling so much as they dry, and when they are flattened out they crack to a degree."—If the prints are dried between blotting-boards, so that they are kept flat while drying, the trouble will, no doubt, be avoided.

E. H. G.—The reason why so few people work ceramic photography is, we believe, that the public do not care for it. Photographers have from time to time tried it with their patrons, with work done for them, but found it did not take. If there were any demand for that class of work, there are plenty who would supply the demands of photographers.

REMO.—The process is, doubtless, very good, but we somewhat doubt if you will succeed in floating a limited liability company to work it. Investors have found the majority of photographic "limited companies" by no means satisfactory investments, and, in future, will doubtless be a little chary as to what they put their money in. We express no opinion on the process itself; that may be right enough.

NOVICE.—What has been published is right enough. Because you "have spoiled nearly a dozen copperplates, costing eighteen pence apiece," you should not condemn those who are good enough to publish their method of working with giving "false and erroneous formulæ." Photogravure is not a process to be learnt in spoiling a dozen or so plates. Before perfection has been reached, hundreds have been spoilt even by the most successful workers.

M. W. C.—If you were paid for taking the negative, as we assume you were, you have no right whatever to use it for any purpose of your own. This you have done by making enlargements from the negative and using them for canvassers' specimens for "club portraits." We are not at all surprised that the sitter is irate and threatens legal proceedings. If he takes them, you will certainly have nothing to complain of beyond your own action, and we expect you will receive but little sympathy in the matter.

R. W. says: "Last year I bought a business here, and, of course, the stock of negatives, many of which my predecessor made copyright. Now, a stationer in another street has published an album of local views more than half of which are copies of these copyright pictures. I wrote to him last week, demanding the withdrawal of these views, and an apology, unless he comes to some terms with me. He replies that he shall do nothing of the sort, and says I have no copyright in the pictures, and refers me to his solicitor. Will you please give me your opinion on the point?"—Unless the copyright in these particular pictures was duly assigned to you, according to the Copyright Act, you have no copyright in them. The negatives are yours, but as you are not the author of them, and the copyright in them has not been assigned, you have no title to it.

CONTENTS.

	Page
OOLLOTYPE PLANT AND ITS COST	289
RETOUCHING SURFACES	290
VOIGTLANDER'S COLLINEAR LENS	291
JOTTINGS. By COSMOS	292
CARBON PRINTING NOTES. By W. B. BOLTON	294
THE EQUIVALENCE OF THE ALKALIES. By G. E. BROWN, A.I.C.	295
CARBON TRANSPARENCIES. By S. HERBERT FRY	295
SOFTNESS IN DEFINITION. By EDWARD DUNMORE	296
OUR ENLARGING APPARATUS AND WHAT TO DO WITH IT. By J. PIKE	297
THE AMMONIUM CARBONATE DEVELOPER.—II. By MATTHEW WILSON	298
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—VI. By T. N. ARMSTRONG	299
OUR EDITORIAL TABLE	300
NEWS AND NOTES	301
RECENT PATENTS	301
MEETINGS OF SOCIETIES	301
FORTHCOMING EXHIBITIONS	302
CORRESPONDENCE	302
EXCHANGE COLUMN	304
ANSWERS TO CORRESPONDENTS	304

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1828. Vol. XLII.—MAY 17, 1895.

THE PHOTOGRAPHIC EXHIBITION AT THE IMPERIAL INSTITUTE.

The Photographic Exhibition may be divided into three parts, historical, educational, and artistic, the two latter, but more especially the second, being quite up to date. In the first, there is this amount to be considered educational, that we see things as they were many years ago, and are thus enabled to institute comparisons between then and now. For example, in proximity to modern specimens we find a collection of the ceramic portraits of Lafon de Camarsac, each bearing his own signature, with dates, 1862–3, which are by no means his very first productions, but of fairly ancient date contrasted with the oldest of the modern ceramists, and we are enabled to ask to what extent, if any, advance has been made in the technique of their production since the days when the inventor of ceramics flourished without a rival.

So also with tele-photo lenses; while modern inventors of this adjunct to photographic appliances are contesting each their claims to having invented the same within the past two or three or more years to be the inventors thereof, here we find an example certified to have been constructed by a professional optician over twenty years since, and on precisely the same lines as those described when this invention was made public in The British Journal of Photography in 1870, and of which fresh inventors are frequently coming to the front. And so with jumelle or other classes of opera-glass cameras—early photographic prints and reproductions made, some of them, prior to the inception of photographic journals and societies. A study of these and other things belonging to the archæology of photography must necessarily prove of interest.

The mechanical department of photo-printing is here to be found displayed as it never was before, and it is only when one takes even a hurried glance at the ample displays of Penrose & Co., Waterlow & Sons, and others, that he can form anything like an estimate of the important position photo-mechanical printing now holds in the arts.

We are pleased to find, from the plethora of exhibits in ceramic work, that this enticing and beautiful class of photographic art appears not only to be not dead, as some have imagined, but evidently destined to enjoy a large share of popular appreciation, and H.R.H. the Princess of Wales is deserving of the warmest thanks of every one for her kindness in lending for exhibition a tea service, all the pieces of which are adorned with burnt-in photographs from negatives taken by Her Royal Highness herself, for this lady is known to be an expert with the Kodak, or whatever other kind of camera she employs. This, we believe, will act as an incentive to numerous others of high rank.

In this, the largest of the halls devoted to photography, are to be found numerous attractive things not hinted at in the foregoing classification, as, for example, specimens of Mr. H. Vaderweyde's optical system of what may be designated artistic retouching or improving upon nature, in virtue of which the possibility of altering the proportion of any one part of the figure, compared with that of any other, is demonstrated; for instance, the hands of a lady sitter may be reduced and the eyes enlarged, according to the designs of the vainest and most fastidious of her sex. It seems somewhat strange that, although this expedient has now been before the public for some years, we do not hear of many, if any, of the profession profiting by its introduction.

Here also are to be seen in active operation the process of producing prints, such as Woodburytypes, a number of hands being thus engaged.

For those interested in the construction of photographic lenses from the raw material, glass, brass, and aluminium castings up through the various stages to the highly finished lenses, the exhibits of C. Burr will prove educational.

Stepping into another gallery devoted principally to a display of the art outcome of photography in contradistinction to technical photography, we find its walls decorated with productions which must charm every lover of art. If anything has proved exceptionally attractive of late years in either the Pall Mall Exhibition or the Salon, here, in all probability, will be found a chance of renewing acquaintance with it.

We have abstained from giving a detailed account of the various exhibits, preferring to wait for a week, when the revised catalogue will have been issued and everything got into its proper place, for this does not prove any exception to the rule that applies to so many Exhibitions, that things are not at their best on the day of opening.

PRINTING PAPERS WITH GLOSSY SURFACES.

Revolutions in photographic processes are usually as slow in culminating as national movements are quick. For some years past, printing-out papers—usually described as P.O.P., the title invented by one well-known firm—have been brought before those interested by papers read at meetings by peripatetic

demonstrators, and by the advertisement pages of photographic literature, and it is only quite recently that they may be said to have really gained a firm footing among amateurs and professionals. Every day there are accessions to the ranks of P.O.P. workers, and only the albumenised paper-makers themselves could tell us if the demand for their special product is being reduced and the output diminished. Without intending to prophesy in any manner, we cannot avoid pointing out the parallel with the introduction of gelatine dry plates. For a long time after their introduction, it was definitely shown that wet collodion had such special properties of its own that it could not be abandoned entirely for dry plates. But, except for copying, enlarging and process work, work of what might be termed the more mechanical kind, where shall we now find a single wet-plate worker?

At the present moment, when summer work will soon come on in full swing, it will be well to take a survey of the printer's field of operations, and examine the actual working qualities and claims to attention of the leading types of glossy printing paper.

As to albumenised paper, there should be little that is new possible to be said upon so trite a topic, but few will deny that, with a good negative, it is almost impossible to surpass the beauty of results attainable with this material. But, if the negative is not a good one, the quality of the print is poor in the extreme. Good printers, however, know how to include negatives with a wide range of qualities under the term "good." With an inexperienced man almost all negatives are bad, judging by results. We think that here is one cause of the steady adhesion to old paths. The practice of years has given an intelligent worker a great advantage over the inexperienced. He knows how to dodge a negative so as to get a good print; he knows how to avoid mealiness, impure whites, stains, and all the bad points that characterise the beginner's efforts. "Is he to abandon the advantage that all this knowledge gives him, and take up a mode of printing that needs no learning?" This is about what he says. But, if he be a business man, he will see the force of the reply. The best process must win in the end, and far better is it to take a good thing upon his own initiation than to wait till he is forced to adopt it.

But is the new kind of paper a good thing? and will it supplant the old by its own inherent good qualities? Let us see. In the first place there is time saved, as against the waste entailed by the operation of sensitising; but, as this holds equally good with sensitised paper, there is no overbalance on one side of the scale. As to the results, however, there is more question. It is much easier to produce a weak than a strong negative. With printing-out papers a weak negative will give perfect prints where albumen, even in the most experienced hands, would give a flat, washed-out effect, with no brilliancy in the shadows and no proper range of gradation in the tones from shadow to pearly greys. This is a cardinal advantage, though again it puts skill at a discount, for any one can get a good print from an indifferent negative. It is, however, not all thin negatives that are advantageously used with P.O.P., the thinness and flatness, due to overexposure, are little better for this paper than the albumenised; but when the negative is fairly correctly exposed, but too thin for albumen, it is in perfect condition for getting beautiful prints from the new papers. So true is this, that we know of one establishment (where the principal has a thorough mastery of ancient and modern modes) in which both kinds are used, the one to be adopted being governed entirely by the character of the negative. Then there is no mealiness in the new papers. Few are the experts who are not occasionally troubled by this fault, while the beginners who feel it are many.

So far for the P.O. papers generally; but how does the matter lie with regard to the two rivals, gelatine and collodion surface papers? This is a difficult question to answer exactly, for the character of each maker's paper varies. One maker's will, from the same negative, give much more contrast than will another's gelatino-chloride, while collodio-chloride papers will give still more contrast. This is a point to be aware of in forming a judgment

A further difference is that the surface of collodion paper prints has not near so much gloss as the gelatine—a great advantage to some eyes, a positive defect in others. It is, further, much easier to obtain a glass-like surface by squeegeeing on glass, &c., if a gelatine paper is used than with a collodion; but many first-class men object *in toto* to this effect—too much like the top of a bonbon box, they say, besides being vulgar. We do not presume to judge between the exponents of the two.

Gelatine paper is difficult to dry and to keep clean, but collodio-chloride prints suffer no harm if dried, face down, upon strings. This alone is a factor of prime importance in deciding which to choose, for the hanging up to dry of some hundreds of prints is no light undertaking.

Both kinds are much more difficult to spot than is albumenised paper, the collodion surface, we are told, being especially difficult to cover so as not to show. Possibly this may be due to the extremely delicate character of the print, it only demanding more delicate working than the usual if its character is to be imitated in the spotting.

These are a few of the leading points of difference, and in thus putting them in a concise form before our readers we trust we may aid them in coming to a conclusion as to the respective merits of the rival papers.

RECENT EXPERIENCES IN SPOTS.

It seems almost impossible to say anything more on the perennial subject of spots on negatives or prints, anything more, at least, that shall have an appearance of novelty; but, during the last few days, two separate cases have been brought under our notice—one in connexion with plates, the other with paper—that do certainly present some new features; new, at least, inasmuch as they clear up mysterious visitations of the spot pest in a manner that we do not remember to have previously seen recorded.

The process of manufacture of both plates and paper has been brought to such a degree of perfection, both chemically and mechanically, at the present day, that it is almost impossible to charge any glaring defects to the producers of either kind of film. That accidental faults may crop up at more or less rare intervals is only to be expected, but that serious defects should pervade any individual manufacture for a sufficient period to cause general complaint is almost beyond the bounds of modern possibility. Yet the complaints that reach us, as no doubt they reach the manufacturers themselves, are numerous enough, if we were not thoroughly accustomed to them, to warrant the belief that, while the complainants knew perfectly well all and everything what they were doing, the defendants were blundering about in a

helpless way, trying to learn their business. In ninety-nine cases out of a hundred of such complaints the fault, if any, or, to put it as it very often is, the mystery, will find an explanation, if sufficiently investigated, that locates it with the user rather than with the producer. We have just fallen across two cases in point.

The first we shall mention relates to plates. A professional photographer, using a fairly large number of plates in the course of a year, had just thought fit to change his brand. Before doing this, however, he had taken the precaution to carefully try samples of the new brand, and these were so near perfection that he placed a considerable order, which was duly executed; but the bulk, as is frequently the case, did not prove to be equal to sample—so, at least, said the purchaser and his operators. At first all went well, but an occasional black spot, scarcely larger than a pin point, would make its appearance, of course in an important part of the picture. These were so evidently in the plates themselves, as they showed more plainly through the glass than on the surface of the film, that a complaint was made to the makers, who perhaps rightly, but at any rate in the usual fashion, repudiated all responsibility, and, in fact, on behalf of their plates, simply denied the soft impeachment.

The matter was then taken in hand seriously in the complainant establishment, and apparently each box of plates that was opened became worse than the last, until it was scarcely possible to produce a printable negative. The defects consisted of minute black specks invisible in the dark room, so fine indeed as to be entirely undetectible in the unfixed plate, but painfully visible, such was the complaint, on taking the negative out into daylight after fixing.

Some of the plates were placed in our hands to try, and proved so absolutely free from the defects complained of or any others, that, after using two or three of them in experiments, we set the rest on one side, to be employed for "serious" work, as in all-round qualities they were decidedly above the average. Some time afterwards, on taking one of these plates out of the fixing bath, we noticed on the surface several patches or groups of what appeared to be minute air bubbles, or bare spots, where such had been, and these presented exactly the same appearance as the spots previously complained of. But the most careful examination of the negative revealed not the least trace of any spots, black or otherwise.

The next plate (of the same brand) developed was examined with the greatest care throughout every stage of development, so far as the light would permit, without the appearance of any spot. Similarly it was lifted out of the fixing bath several times during the process of clearing, with a like result, and directly it was cleared it was washed and taken out into daylight for more careful examination, the same curious patches of air bells having been noticed. At first, no trace of spots could be found, even with the aid of a magnifier, but, on taking the negative into a strong light under similar conditions, very faint spots were detected, corresponding with the position of the patches already referred to. Turning over the negative to see if they were visible there, numerous minute specks of undissolved silver bromide were found, and then we had the clue to the mystery. Placing the negative for a short time in full daylight, the spots literally developed to full intensity.

It turned out that the particular films were subject to a sort of repellent action, resulting in the formation of minute air bells on the surface, which caused specks of slower fixation. If a sufficient time were allowed, the fixing solution would act by diffusion within the film, but, of course, more slowly than where it had free access. In the case of insufficient time being allowed to produce this result, the particles of undissolved bromide naturally discoloured, partly by the direct action of light, and partly under the influence of the developing solution remaining in the film. The sudden increase of the trouble after the first discovery was directly due, as in our own case, to the careful examination of the plates in daylight when imperfectly fixed.

In the other case to which reference has been made, the material complained of was gelatino-chloride paper, and the fault was, as in the previous one, minute black spots. These were totally undetectible before or after exposure, but made their appearance when the prints were in the first washing water. Any prints in a batch, though they were few, that passed unscathed through the first water escaped altogether, so that evidently it was the fault of the water (so it was argued), which contained particles of matter that were seized on by the free silver in the paper. But boiling, filtering, and changing the water—even using distilled water—had no effect; so, then, of course, the paper itself had to take the blame, and the matter was changed. Very little amelioration of the trouble ensued from this course, though occasionally there would be freedom for a day or a day or two, but eventually, when the albumen paper used in the same establishment began to show the defect, it became clear that it could not be the paper.

We need not go through the details of the search that led to the discovery of the cause, which was simple in the extreme. A dusting brush used in the "filling room" for negatives and paper had been employed some months previously for coating paper with solution of ferric oxalate, and, when discarded for that purpose, after being soaked for several days in water, had been dried and restored to its original use. It was found that if this was passed two or three times over a sheet of paper, or, better still, if it were violently shaken over it, although the paper showed no signs of spots when dry, the instant it was wetted the particles of iron were acted upon by the free silver, and produced the spots that had caused so much trouble.

Since hearing of this case, we were mentioning it to a friend, who informed us that he had traced a similar epidemic of spots to a dusting brush that had never been applied to any other purpose, the spots arising simply from particles of rust coming from the metal binding. The moral is obvious, Avoid metal-bound dusting brushes, and especially keep such as are employed for the purpose of dusting alone. But better still, we think, is it to use a velvet or plush pad, which removes dust more effectually, and is more easily kept clean.

We have gone into these two cases somewhat in detail, as they form very typical instances of the manner in which the materials and their manufacturers are frequently made to bear blame that really attaches to the user. And we would impress upon all our readers the necessity for carefully examining into every detail of procedure, however impossible it may seem that the fault lies at home, before sending the blame elsewhere.

The Picture Trade.—A fortnight ago reference was made to the general depression that has existed in the picture business for the past year or two. Since then the Royal Academy has opened its doors, where by far the larger number of pictures shown are for sale. Indeed, to this event many of the R.A.'s and Associates look for the disposal of the greater part of their year's

work. We learn that what was said in our penultimate issue is further confirmed now that the Academy is open, namely, that artists have great difficulty in disposing of their pictures, even at prices far below what they had anticipated realising. We are told also that foreign publishers, who annually visit this country at this period for the purpose of buying copyrights, will not, this year, give the same high prices they have formerly done for works of equal merit. All this shows that there is general depression in the fine-art business just now, so far as this country is concerned.

Springtide and Spring Effects.—Many of our weather-wise friends, taking their data from the severity of the past winter and its lateness, predicted a late spring. Their prediction, however, has not been verified. Here we are in the middle of May, and things quite as forward as usual—indeed, some are more so; but, judging from present appearances, spring will be but of short duration, and, so far as foliage is concerned, we shall soon be in summer. Why this matter is alluded to is to remind some that effects are to be obtained in the springtime that cannot be secured at any other. Shaded buildings or ruins, if taken when the foliage is full and dark, will be almost hidden. If taken when the trees and shrubs are devoid of foliage, they will have a weird and sombre appearance; but, if they are taken when the trees are just assuming their spring garb, the whole aspect is different. The same applies to many shaded glens and plantation scenes. Therefore those who desire to secure such views must lose no time in securing them, or they will not have the opportunity of doing so for another year.

More Substantial Damages for Piracy.—A case was decided in the Queen's Bench on Saturday last which proves again that the law will give photographers protection against the piracy of their works by the illustrated press if they will put it in motion. Mr. Gambier Bolton brought an action to recover penalties and damages for an infringement of the copyright in one of his photographs against the *Illustrated London News* and the *Sketch*, and for an injunction to restrain further publication. The defendants representing the former paper consented to an injunction against them, and agreed to pay costs, and were discharged from the action. The case against the *Sketch*, however, was proceeded with, and evidence given that the sketch of a *Yawning Tigress* was made from one of the plaintiff's photographs which he had taken at the Zoological Gardens, and that the publication would prejudice his rights. In the result an injunction was granted, and Mr. Bolton was awarded 10*l.* by way of penalty, and 40*l.* as damages—fifty pounds in all. Unsatisfactory as the law of copyright is, it will be seen it is equal to meeting, in a substantial manner, a case of piracy such as the above.

Process Illustrations and Academy Pictures.—There is very little question that this country can now hold its own with regard to half-tone process blocks against every other. Unfortunately, however, some of the illustrations in the works annually brought out in connexion with the Royal Academy pictures do not tend to substantiate the fact. Many of them are no credit to English process work. Some of the mediocre work is, no doubt, to be accounted for by hurried execution—alike in the photographing, the making of the blocks, and in the printing—in many cases the latter especially. There is one point in connexion with these illustrations that requires comment, namely, the negatives from which the blocks were produced. A large proportion of them are not by any means fair examples of what can be done in the way of orthochromatic photography in copying paintings. The colours of the originals are not properly rendered in the negatives, and consequently in the illustrations. In respect to the reproductions of paintings, England, we are sorry to say, cannot as yet take the foremost place. Any how, the various illustrations of the Royal Academy show must not be taken as good examples of English present-day process work.

The Pictures at Guildhall.—As might well have been anticipated, the loan collection of pictures in the City is attracting large numbers of the art-loving public both on week days and Sundays, for the Exhibition is open on Sunday afternoons. Photographers will do well to see this show, particularly those who take an interest in orthochromatic work. It is a vexed question with some workers as to how certain colours in a painting should be translated into monochrome. Now, in this Exhibition there are some original paintings with which we are all familiar as engravings, by different methods and by leading engravers. It is therefore interesting to see how they have dealt with the subject, and it will be noted that they are not all in accord in the matter. Amongst the works that are shown, and have been reproduced and become very popular, may be mentioned Frith's *Claude Duval*, the engraving from which, if we mistake not, was the presentation print of the Art Union some thirty years ago; O'Neil's *Eastward Ho!* Sir Frederick Leighton's *The Garden of the Hesperides*, reproduced by photogravure; Millais' *Rosalind and Celia*, reproduction in mezzotint by Simmons; Leslie's *School Revisited*, engraving by Stacpoole, A.R.A.; Millais' *Over the Hills and Far Away*, etching by Debaines; *Death of Chatterton*, engraved by Barlow, R.A., &c. It will be seen, from the brief list here quoted, that the reproductions are by the best representatives of the different methods of engraving, and it is valuable to note how they have treated the subject of translating colour into monochrome, and, as the majority of the paintings are from private collections, the opportunity of seeing them may not occur again.

ON THINGS IN GENERAL.

One of the saddest "signs of the times" is, it appears to me, the various letters of the "hard case" type at present appearing in this Journal; and, with Mr. Snowden Ward bringing before our notice the lamentable state of the funds of the Benevolent Society, it is difficult indeed to suggest a remedy. There is much really sound advice in the *soi-disant* bricklayer's letter of a week ago, but who will take it? Possibly things may come to a crisis of some sort before any improvement will be seen. It cannot be doubted that the fatal facility of photographic technics is the underlying cause of all this outcry against cheap work and low wages. Any one can take a photograph who was not born an idiot; what cause, then, is there for high wages? None but the possession of skill beyond the average. It would take any one a much longer time to learn to make a shirt than a photograph, and it is a sad old tale what are the wages of the shirtmaker? In the early days of photography the ranks of its professional workers were largely recruited from the unsuccessful whitewashers, bootblacks, and so on; the few educated men then practising it soon made their mark, and made money too. By-and-by, as a higher standard arose, really good men took up the art, and prospered. Dry plates, again, caused a rush of outsiders, and now the ranks are chockfull; and, with the great trade depression acting as a drag, assistants are many and posts are few. But there is still, if we may judge by appearances, money to be made out of photography by talented and experienced men. It is a true saying that it is easier to find a good doctor in a town than a good photographer.

These thoughts naturally lead to "process" and "collo" work, and the leading article in last week's Journal will be valuable as showing one side of the question, the possibility of doing that kind of work without the need for any great capital investment. It must, however, be borne in mind that the article, as indeed it states, refers only to what might be termed private work. If it is intended to go in for general trade production, it will be found that plenty of capital must be provided if success is to follow. Just the same as in photographic portraiture. A man in the latter cannot make much of a show unless he has at least a thousand pounds at his back. And yet photography is such a simple thing, that any one can learn, I may be told in my own words. But—there is always a but—if money is to be made, the photograph must be uniformly well done, and artistically done, and the proprietor of a studio must have business ability, which, alas! is even a greater necessity than technical ability. It is in the experience of all old hands how many really able photographers have gone to the wall simply because they were not

"business men." I should like to make one final remark connected with this subject on the topic started by "Drop Shutter." The writer of the advertisement, to which he publicly called attention, explains that, though he gives twelve shillings and board, the whole payment is worth thirty shillings a week. I will not discuss the ethics of the point, but I must say that in my opinion a man who is worth, or is paid, only thirty shillings a week has no right to spend nearly two-thirds of it in board, for that is really what it amounts to.

What an unfortunate effect the last cylinder explosion is having upon the public mind. I quite agree with one writer who said the proportion of accidents from cylinders is far less than is recorded of kitchen boilers; yet no one wants to practically fine the owner of such boilers because of their danger. Mr. Wenham's plan of converting the inside of the cylinders to the non-oxidisable form of iron is excellent, and, if adopted, would, it cannot be doubted, most materially lessen the possible danger arising from the products of the action of oxygen on the interior of the gas cylinder not so protected. That we have, however, something yet to learn about the cause of cylinder explosions is certain. I don't mean the sort of learning exhibited by the member of Parliament who gravely explained that the explosion was caused by the cylinder being charged with chlorate of potash!

What a bombshell Sir Frank Lockwood has thrown into the photographic camp in his recent notable attack on photography and photographers. With bated breath I say it—I believe he was right to a great extent. Though it is no part of a photographer's business to bolster up another profession, there can be little doubt that it is doing its best to kill good wood-engraving. But it will never do that; the best process block ever done cannot touch in pictorial excellence a good wood-engraving; its real tendency is to exalt the latter. But where the evil comes in is in the abundant pushing out of the engraver's art brought about by photographic block work. The main value of photography for illustration should be topographical, as artistic as possible, but topographic before everything. Then, an editor ought to exercise some judgment in the choice of blocks. There are special "art editors" to some illustrated papers, and yet, forsooth, they publish rubbish of the most astounding nature. Can it really be possible that they do this because they can get their blocks for nothing? Not all; there are conspicuous exceptions. Let me instance (not as being the only example) the weekly *Graphic*. It pays photographers well. I know one who received twenty guineas for two photographs; but we do not see many process blocks in its pages. The photographs are usually translated into wood (not always to their advantage, I will admit). As to this latter point it is worth noting that the *Strand Magazine*, in its series of portraits of celebrities, almost, if not quite always, makes a wood-engraving from the photographs, however good they may be.

I cannot refrain, while dwelling upon this topic, from again pointing out that photographers have themselves to blame for the low estimate of the value of their work made by publishers. They are often so pleased to see their name in print, from the imagined value of the advertisement it gives to their wares, and so terribly anxious lest some other man's should be seen oftener than theirs, that they would almost go the length of paying to have their pictures published. Let me conclude with a word of advice. It is so commonly believed that the oft-quoted "half guinea" fixed, be it remembered, as a minimum honorarium for the use of a photograph, is the fixed allowance that they do not dream of asking more. But this is an error. Given a very popular subject, or a notorious personage that every one is talking about, then the man who has a good negative may get a great many half guineas for its use, especially if he give the sole right to publish to one periodical only.

FREE LANCE.

LANTERN SLIDES PICTORIALLY CONSIDERED.

[Dundee and East of Scotland Photographic Association.]

THE title of my short paper is not a very fetching one to many people. To get out of the usual rut, and have anything to say upon a subject which may either be studied or let alone, seem to bespeak giving one's self airs. For this reason I have sometimes heard a good paper on optics, or other cognate subjects, dismissed with some such remark as that such-and-such knowledge was all very good from a theoretical point of view, but the practical man was above needing such information.

The practical man can never have too much information, and I have seen a practical man helped out of a difficulty he had fought with for a month, in two minutes, by the theoretical man. One, however, has to excuse his ignorance in some way, and if it must be done, I suppose the usual plan of pooh-poohing the information as being theoretical, and therefore unnecessary, is as good as any.

I am not giving myself any airs to-night, I can assure you, for I frankly confess that I had, till quite recently, thought very little about the subject of my remarks.

Better late than never, however, and since I have given the matter consideration it has every day gained in assurance in *my* mind at least.

My remarks will not cover the whole question of pictorial slide-making, but only one or two points, original so far as I am concerned. I am no believer in what are called the "canons of art." They seem to me to be responsible for the loss of a good deal of originality. It will please a good many of you to hear this, as it will spare you the infliction of wearisome explanations of such terms as "balance," "pyramidal composition," and suchlike, terms many of us are rather tired of. While I thus indicate that I have no intention of reading a paper on pictorial composition, I would explain that my remarks are to deal with pictorial effect, not strictly from the point of view of composition. As no special arrangement is necessary, I take the first point that occurs to me.

I begin to think that heretofore I have been photographing subjects that look well upon ground glass, in small sizes, forgetful of the after-coming process of amplification in the lantern. I am not solitary in my error, for I notice that most of the slides shown at our meetings are of subjects such as would invariably be painted upon a small canvas by an artist.

At first sight this seems to be no great point, but a little consideration will show that it is very important. It is not an easy thing to say why certain subjects do well enough in small sizes and not in large, but authorities in these matters will tell you that a subject, quite sufficient to agreeably fill a small canvas, will look quite incongruous on a large. In an exhibition of paintings, everyone must have noticed that the small canvases are by common consent devoted to what might be termed small subjects, while the larger canvases are devoted to what might be termed large or grand subjects. There is a certain incongruity in devoting a gigantic canvas to a trifling subject.

The quaint gable, moss-covered and dove-coted, may make a charming little picture twelve inches by fourteen, but one would scarcely look for such a subject upon a canvas six feet by seven.

Simple subjects may be represented within narrow limits, and one feels that it is more congruous to do so. On the other hand, to adequately fill a large canvas, the artist is expected to choose such a subject as requires space, he somehow naturally looks for subjects of dignity and importance in large canvases.

However difficult it may be to explain the feeling, it is there all the same, and equally there in those who know pictures and those who don't.

Let me ask you to consider the effect of such a subject as a child's portrait thrown on the screen by the lantern; does it give one the idea of a monstrosity? On the other hand, how natural and beautiful the effect from a slide holding within its grasp, so to speak, a "Shehallion," or "Ben Nevis."

One recognises that their sense of proportion is not outraged. Now, it is this sense of proportion which we photographers are apt to ignore in our slide-making. By far too many of our photographs are really not suitable for enlargement to something like a seven-feet disc. However beautiful our slides may look in the hand, most of them suffer by enlargement.

Not only is there some kind of a natural feeling such as I have described, but there are deeper reasons to be considered. In the first place, the light and shade of a diminutive picture may be much more violent, without being offensive, than in a large picture. The effect upon the eye is not only as to proportion, but as to total amount of shade. Every one must have noticed how harsh a picture appeared upon the screen when in the hand it seemed simply vigorous.

I do not know if I am alone in my impressions, but does it not occur to some of you how "staring" the great bulk of projected scenes are? My eyes ache much more after a lantern display than after examining an equal number of photographs in any other way. I put this down chiefly to the hardness of the great bulk of lantern slides. The pain cannot be caused by any effort of the eye to pick up diminutive objects, for projected photographs are the largest of all pictures. I take it that the strain upon the eyes comes from

the sudden and violent change from light to dark which the retina is subjected to in its various parts as the individual rapidly scans the black and white of the picture upon the screen. However this may be, everybody must have noticed that one picture would be easy on the eyes and another hard.

If, then, there are two kinds of pictures such as I have described, and if my explanation be the correct one, we are, most of us, making our slides much too black and white for the amplification which they undergo in the lantern. The effects are altogether too violent for such a size of sheet as is usually employed in lantern work. But some may be inclined to ask if we are, most of us, making this mistake, what is the factor that seems so powerfully to determine us in the wrong way, and that I will try to answer.

When one sets about photographing (say) a scene from nature, he is guided by the appearance upon the focussing screen. If he is an old hand, he insensibly strives after vigour; indeed, if he be working very small sizes, such as quarter-plates, the composition of his picture must be bold and telling or he will see nothing worth exposing a plate upon. Truly he makes the best of it if his views are to be printed on paper and held in the hand; but he makes a big mistake if his pictures are for the lantern. The conditions are now entirely altered. That distant hill which looked like a mere line across his quarter-plate, and which he sacrificed for a more vigorous belt of trees, would have been the making of a lantern picture. That clump of whin which seemed on the ground glass to give such vigour to the foreground, is now, on a ten-foot screen, a staring patch of black and white painful to look at.

This is where we must look for an explanation of our harsh effects; and this would be an easy enough thing to guard against, it might be thought, but it is not easy, it is difficult. Just as one's sense of the pictorial is keen, so he will find it next to impossible to make the sacrifice demanded of him when he views his pictures on the ground glass in the field. He cannot somehow forego the satisfaction of making the little composition as perfect as he can, he forgets the future in the present, and ruins his negative for slide-making purposes. It is a pitiful thing to think that one cultivates his art faculties only to mar his work, and yet, in the matter of negatives for lantern slides, this sometimes happens.

I recollect seeing a very young photographer calmly pointing the all-seeing eye of a guinea quarter-plate camera straight up the face of a mighty Highland glen. It struck me rather from the comic side, and yet, although the resulting picture might have been sorrowful enough to see in the hand, it is something like this we want for lantern-slide work.

The next point upon which I would like to make a few remarks is this: Those who have worked a little with the pencil, chalk, or brush, know what a mighty difference a neat, trim, and suitable margin of white round a monochrome picture makes. It does not seem to have struck anybody to display their black-and-white work in black frames, so to speak, and without margins except photographers. When they project their pictures upon a screen there is nothing of the nature of a mount or margin to them. Had it not been that the margin fulfilled an important function, no doubt long ago, by the natural working of the law of the survival of the fittest, the white margin would have been a creature of the past.

Of course, it may be argued that the function of a white margin is simply to isolate a picture from its surroundings, and that the screen picture, being cut off by the natural darkness round it, is sufficiently isolated already. Now, admitting, for argument's sake, that that is the only function of a margin, it must, I think, be allowed by all that the mere absence of light round a screen picture is a very poor and negative kind of isolation, after all.

But isolation is only one of the functions of a margin. Everybody, I presume, understands what is meant by tone values. Briefly, it means the amount of black, say, which must be used to represent various colours in a composition. Say that a drawing has to be made in black chalk or pencil of such a subject as a plate of fruit, consisting perhaps of lemons, green grapes and black, or blue grapes. How dark must these various objects be to roughly represent the intensity of colour carried to the eye from the lemon and the two kinds of grapes? None of them will be white, of course, and, assuming that the lemon will be the lightest, it will yet be darker than pure white; the green grapes, slightly darker than the lemon, and the black grapes darker still. These are the tone values, and now here is what I am driving at: A white margin will show that the lemon was not white, but a pale tint of some kind less luminous than white. From the value of the lemon you can determine the values of the grapes.

Suppose, now, we remove the white margin. What happens? You have lost the key to the tone values. There being no absolute white with which to compare the lightest part of your composition, the lemon may now be mistaken for a white object, the green grapes may seem to be lemon yellow, and the blue or black grapes green. Under no circumstances can black and white give you the proper colours, but it is even something to know that a coloured object, such as a lemon, is not colourless, but tinted with a pale tint of some kind.

To those who cannot as yet see what bearing this has on photography, I would further explain. All must have noticed how very frequently sunshine effects are mistaken by the uninitiated for snow scenes when shown on the lantern screen. Dust on the road looks like snow, the sunlight on the leaves looks the same. Why is this? No doubt some of the pictures are bad, but not all such. The road is not absolutely white, neither are the high lights on the leaves; but, having no absolute white wherewith to judge, they *seem* to be white and hence the snow effect. When a faint trace of a cloud is seen in a slide, the maker will tell you there was a fine sky to the negative, but some how it has not printed. Let that same slide be printed with a white margin, and to his astonished eyes he will find that the sky prints up just like the rest. Having nothing to test his tone values by, the sky is a speckless white apparently. Try beside it a space of *actual* speckless white, and note how far it is from being white.

I would have, and will have in the future, every slide I make with a suitable clear glass margin to it. Then will there be not only good isolation, but a guide to the correct tone values of the slide.

Before considering possible objections to my suggestions, I have this further point to bring up. Probably every one here knows what artists mean by the keynote of a picture. To those who don't, it may be briefly explained that a picture, just as a piece of music, may be executed in a high key or a low. A picture of some storm-beaten coast, painted in sober tints of grey and brown, would have a low keynote, while a cornfield in sunshine would, painted in appropriate tints of yellow and blue, have a high keynote. Pictures in black and white may be said to have keynotes also, although devoid of colour. An etcher will etch a picture in a high key or a low, just as he wishes to impress the spectator. By adopting a high key (that is, in working tones expressive of bright tints) he produces a bright and gay effect, while, on the other hand, when he would produce a sombre effect, he works his picture in a low key, that is, in tones expressive of quiet tints. This is every day done by workers in black and white. Now, here is where it strikes us photographers, without our margin of white to act as a kind of standard of light, a decided keynote can never be adopted. In place of saying to ourselves, Is the amount of the black in this slide just expressive of the effect I wish to produce (whether grave or gay)? we can only ask ourselves, Is this slide *dense* enough to produce a vigorous picture upon the screen? In the mean time, we cannot afford to adopt a high key, and for why? Without a margin of white, it would simply appear a poor, weak, flat thing, as if half developed.

When I first began making lantern slides in carbon, my great difficulty was to get density. As most of you are aware, carbon work is done with what is termed a safe edge, that is, a masked margin all round, which, in the case of a lantern slide, gives a white margin on the slide. Although these early slides of mine appeared uselessly thin in the hand, I have searched out and tried some of them in the lantern, and find them absolutely perfect as to density, *shown with the white margin.* Not only does this white edge make it possible to show slides of a thinness and delicacy utterly useless without it, but, when we wish to produce a powerful effect, what better plan could we fall upon than to contrast our dark tones with the pure white of the margin? And, now, what objections can be urged against the idea? I can fancy three objections. In the first place, if there is to be a good broad margin of white, it follows that, upon the average screen, the picture must be much less than we are accustomed to, and therefore visible to fewer people at a time, and from a restricted distance.

I can meet this objection. What would our friend, Mr. Lamb, or any art *connoisseur*, think of an audience such as this, sitting down to enjoy one or other of his fine paintings, at varying distances from it of five to fifty feet? It is plain to the meanest capacity that at such varying distances many must be too near, and many too far, from the picture. Every one admits that there is a *proper* distance from which a picture should be viewed; one must be sufficiently removed from it so as to command the composition as a whole, while he must not be so far away as that the meaning of any part is lost.

Without entering into a discussion as to what the precise visual angle should be, it is enough to say that artists are agreed that a picture should be viewed at not less than a distance of three times its longest diameter from it. How does this work out with our

present arrangements? Our pictures upon the screen are about seven feet in their longest diameter, perhaps. If this be so, it follows that all those sitting within twenty-one feet are too near —the front chairs absurdly so—while those beyond this (not many generally) are too far away. Now, what disadvantage would there be in having the actual picture four feet in its longest diameter, while the remainder would represent white margin? There would be no disadvantage at all, for the proper distance from which to view this picture would be twelve feet, a distance which, with our present arrangement of chairs, ranging from five feet backwards, would much better suit the average spectator than the present twenty-one feet; but, even if it could be shown to be a disadvantage, surely we are not to make mediocre pictures simply that they may be shown to a greater number of people at one time. If a white margin would vastly improve our slides, and, if there is a proper standpoint from which to view them to the greatest advantage, by all means let us make our slides the best we can, and view them from the proper standpoint, be that five feet or fifty.

Whoever heard it as an objection to a four-feet canvas that it couldn't be seen from as great a distance as a seven-feet one? The second objection which might be raised is this: A white margin would necessitate a sky of some kind to every slide to complete the upper part of the picture, otherwise the white of the cloudless sky would merge into the margin, producing a very undesirable effect. To those who are pleased with such slides as they can throw off a dozen in an evening, this is a very valid objection; but, as I have a few words to say later on upon this, I content myself by saying that, if the white margin compelled people to print skies to all their slides, it would be a huge point gained. The third possible objection might be the difficulty of producing margins pure and spotless. Well, I admit that minute markings upon the picture itself might escape notice—not a speck but would be painfully evident on a clear margin. Still, this is only a question of clean and careful manipulation, and the objection has no weight unless you are prepared to say that a white margin is not worth the extra trouble. This, of course, must be left for the individual to decide. Those who desire to produce the finest results must take the trouble or be pleased with the commonplace.

I had intended to have raised other points in the production of pictorial lantern slides, but must leave them over for another occasion, and bring my remarks to a conclusion for the present by asking this question, Are the slides which the majority of us are producing worthy the grand idea of optical projection? The optician has given us an instrument almost perfect for its purpose; the chemist has supplied a light, brilliant, cleanly, and safe; and we take advantage of these boons to enlarge and show off our trifling fragments printed a dozen an hour from odd corners of all sizes of negatives designed to no such purpose. I would have a man to spend much thought and much time on the production of a slide. Make such a one as half a dozen of its kind would be a season's work. Let the subject be carefully selected, the time of year and time of day determined upon, the shape of the picture, the kind of sky, and last, but not least, the colour of the slide all carefully predetermined upon, and the result, I am sure, would be something to look upon with pride.

I have sometimes thought, as I have looked at the magnificent carbon enlargements of the Autotype Company and others, that, if work like this were within the grasp of the average amateur, photography would indeed be a noble pastime; and yet everything in a fine carbon enlargement may be got in a diminutive lantern slide, and projected of equal size upon the screen. I believe that for high-class work, such as I suggest, the carbon process of slide-making is a necessity. By no other process can the beautiful half-tone, so necessary in any picture, but specially so in a large one, be produced; by no other process is the colour of the slide absolutely under the control of the artist. Speed the day when the hopeless task of judging *sets* of slides will be a thing of the past, when each shall bring a single slide, as an artist may bring a single picture, to testify to the art there is in him. Not such a slide as we generally now produce, the outcome, perchance, of a happy accident, or anything that one can tell to the contrary by looking at it, but such a combination of beauties as could not possibly be produced but by design—to debase the words of the immortal Shakespeare to our uses, "a combination and a form indeed where every god did seem to set his seal to give the world assurance of a man."

J. K. Tulloch, M.B.

"A. P." JOTTINGS.

[West London Photographic Society.]

It is the custom at the West London Photographic Society's meeting for the lecturer to apologise more or less for appearing before his audience. I shall be original enough to dispense with this, as I expect that those who do not want to hear my remarks will do what I think most of our members generally do, viz., stay away, and that those who may have curiosity enough to come and listen to my sayings will not think any more of me for depreciating myself. In fact, I think I may say that life is more or less of a game of brag, and those who brag most are most thought of. I may therefore say at once, in starting the game this evening, that you must forget that I am an ordinary member, and must look on me as a celebrated photographer whose word must be taken as law, and whose art principles are more to be believed than those of the most noted wielder of the brush. And this idea does seem to have impressed itself upon the minds of many of our would-be photographic artists, as we find them arguing with men who have spent the best years of their lives in the study of art rules and composition and the best effects of light and shade, though their own education in art principles probably began when they bought their first Lancaster outfits, and were duly impressed with the artistic beauties of their early efforts. And why not? They have gained the goal they aimed at, and in the little photographic world the Davisons, and Hintons, and others are probably as highly thought of as the Millais' and Leightons of the artistic fraternity. But, alas! outside of it, who would know that Davison was the great fuzzyist, and Hinton the marshyist, and Maskell the apostle of sawdust? But we, as photographers, of course look up to these great men with reverence, and endeavour, with more or less success, to copy them in their sayings and doings. And so the world wags.

Having proven my right to lecture you this evening, I will now give you my reason. When our worthy Secretary approached me I would, under ordinary circumstances, have kept my usual backward seat in this meeting, but, owing to the many resignations that were sent in at the beginning of this session, I felt it my duty to assist the Society by all the means at my disposal. And I trust that all the members will be actuated by the same feeling, so that we may show the photographic world that, although we have lost our more prominent members, there are others ready and willing to try and fill the vacancies. And, above all, let us remember that this Society was not founded for the purpose of giving titles and office to certain gentlemen, but was formed for the benefit of all collectively, and not for any individually. As the Society has, as it were, started afresh, let us trust that all petty personal pique may now give way to the broader views of our collective interests.

Some of you may wonder at the title of my paper, and the President at the last meeting said that "jotting" might mean anything or nothing. Exactly so, and for that reason I chose it, as, not having any particular photographic process on which to dilate, a title that will leave me free to ramble where I will is one particularly suited to my constitution. At the outset, though, I may say that the title I *did* give to the Secretary was a little more explicit, as it was "A. P." Jottings, which tied me down to amateur photographic jotting. Why he left the "A. P." out I cannot say, unless it was that a paper that was delivered before you some weeks ago referring to the "A. P." had caused a certain amount of dissension and bad blood in Creed Lane. However, I can set his mind at rest by assuring him that the paper this evening does not refer to that interesting paper—A P riodical well known to you all. No; these are simply the jottings on any interesting subject that occur to the very amateurish A. P., your humble servant. Jotting No. 1. "Why do we go in for photography?"

A rather difficult question to answer.

For amusement, would naturally occur as the first answer. But is it amusement to start out on a blazing afternoon with a camera and stand weighing anything between one and one-and-twenty pounds? or is it amusement to go off on a cold, frosty morning and stand up to the boot-tops in snow, and turn numberless brass screws with fingers numbed with cold? or to take a view of a quaint building with all the children in the place posing around? or a river scene with the steamers' wash threatening to overwhelm one? For instruction, another answer might be. Well, it certainly is instructive to see the effects of two pictures on one plate, and to spend an hour or two in trying to coax out a photograph on the unexposed one. It is instructive to spend a whole year on getting pictures ready for an Exhibition, and then hear them slated by the Judges. It is instructive to show your pictures to your friends, and have the mounts admired, and to have your best platinotypes referred to as bromides. It is also instructive to take six dozen plates away on your annual holiday, and find out afterwards that they are all faulty, but rather an expensive form of instruction. Well, perhaps you will ask, Why do you go in for photography? I must confess that I might find it very hard to answer that question. The only answer that would occur to me on the spur of the moment is that, *having* started it, I will not give it up until I succeed in mastering it. But, on second thoughts, it is very easy to say why *I* took it up; but why *you* did I do not know. If it will interest you to know my reasons for doing so, I shall be most happy to inform you. I have a brother who goes in for it, and who commenced before I did. Well, at that time I was doing, or trying to do, a little in the pen-and-ink-sketching line. I won't show you the results, as it might tempt you to throw up photography, and then this Society would lose your subscription. At any rate, this brother of mine was, at that early stage of his photographic career, doing what most of you did, I expect, printing on the most highly glazed paper in the market. My more artistic mind was very much taken with a bromide print, in the

Annual, of a sailing boat, by Morgan & Kidd. I therefore borrowed his negatives and printed them in bromide. My downward career from that moment was rapid. If I had contented myself with letting him carry the camera, buy the plates, and undergo all the other evils of photography, I could have quietly remained at home and mixed my chemicals, with the certain conviction that, if I did not practise photography theoretically, at any rate I did it economically. But no; we are all wise after the event. I must needs take my own negatives. And, when one comes to think of it, what tremendous results accrue from such a small beginning. After all, a box of twelve plates can be bought for one shilling. If we bring a little knowledge of arithmetic to bear on this, we shall find that each plate costs a penny. A non-photographer may smile, and think, Well, the results are not so tremendous, after all. Poor deluded mortal. Wait till you want to make use of these penny plates, and your smile may possibly fade away, like a silver print. This penny negative, like a diamond of the first water, requires a good setting. Plenty of highly polished mahogany and brass fittings innumerable, with occasionally a casket of lenses, and a leather case with the proper green-base lining, to say nothing of dishes and bottles; all these are required before you can even look at your penny plate.

The first outlay for this pleasing purpose of spoiling plates was 10*l.* 10*s.* for a hand camera, and 18*s.* for a case which I never use. If I had kept up my sketching instead, what gallons of ink I might have bought with the money. And that reminds me that all the useful hints that would be of use to one before purchasing an outfit never come till afterwards. I was only reading the other day a paper by Mr. Maskell, in which he said that he did not care twopence for all the new papers and cameras, and lenses, and developers, that kept coming out. All he wanted for the purpose of practising photography was a box, a plate, and a pinhole, with pyro ammonia and bromide for developer, and carbon paper for printing. If I had read that article before I purchased my outfit, I might have been a wealthy man by now. But the outfit is a mere fleabite to the after-processes, which I will not go through, as they are as familiar to you all as they are, alas! to me.

And here I would like to make a few remarks on the subject of photographic literature generally. One takes up a journal, and the first article will be perhaps on the advantages of a certain developer, which the writer declares to be the finest ever invented. If your negative is over-exposed, all you have to do is to add a little bromide; if under-exposed, a little water; and, whatever the exposure, the result is always the same, a perfect negative. Then one turns to the next article, and the same remarks apply to quite another developer, with precisely the same results. Then another writer will strongly advise his readers to stick to one certain plate, which is the acme of perfection, whilst another will say one must suit one's plates to one's subject. *One* will strongly recommend the hand camera, *another* will declare it to be absolutely useless for artistic work. Well, as we are told by the ancients that "in the multitude of counsellors there is wisdom," and again that "too many cooks spoil the broth," I suppose that photographic literature is only following the usual course, namely, safety. If the beginner complains to the editor of his advising him to follow a course which has proved disastrous, the editor is always prepared with a test showing that he recommended a totally different method of treatment. Therefore, the only way for the youthful photographer to achieve success is to try all methods and find out the best. And this, after all, is the only real method of working. Because a certain developer will suit one man's method of work, is it any reason for suiting another's? And I would go further, and say that the perfect negative, got by the one developer, may prove, after all, but a delusion and a snare. For this reason, that I know of many workers who do not look beyond the negative. If they get a really pretty negative, one with what is called brilliancy and sparkle, they care not what the resulting print is like, and as often as not do not even take a single print from it. What possible enjoyment these people get out of a negative I fail to conceive, as, after all, the negative is merely a means to an end, and, if one does not take a print from it, it might just as well remain unexposed.

But, as these writers aforementioned have possibly left you more or less in a fog, perhaps I may venture to offer you my opinions on the best developer. Well, I have tried a few in my short career. I could show you negatives as yellow as a guinea developed with pyro and ammonia or soda, others as clean and bright and sparkling as a freshly opened bottle of soda water, developed with hydroquinone, others clean but thin, giving beautiful soft results, developed with amidol, or metol, or rodinal, or glycin, to say nothing of our old friend iron. But, with all this formidable array of developers before me, if I have any particular view that I wish to make certain of, I always fall back on the old-established pyro and ammonia. The negative may not be pretty, but the resulting print I always think is as perfect as can be got from any properly developed negative. With hydroquinone you will probably get all blacks and whites, while with the newer developers you may get soft negatives which will yield all half-tones, and no contrast, but with pyro you seem to get a beautiful gradation from highest lights to deep shadows. But here we should have some idea, when developing, as to what printing process we intend using. I have always found that the much-praised yellow negative is apt, with many processes to give good gradation and detail in the landscape part, but the sky and water to print too hard; whereas, if a preservative is used, such as sodium sulphite, and the negative kept clean, the gradation in the high lights is preserved. This more especially with albumenised and printing-out papers. With the new cold bath platinotype papers I have found that yellowness in the sky, unless the negative is very thin, is quite fatal in its results, whereas with carbon, a dense and yellow negative will give splendid prints. We read in the papers just now a lot about the beauties of carbon printing and almost a protest from the editor of one paper against its neglect by amateurs. Well, I should be the last to speak against pigment printing, especially as I use it more than any other process; but, at the same time, I do not see why we are to be ordered by the editor of any paper what we *shall* use, and what we *shall not*. There are enough processes to suit any amateur at the present time, and, if you prefer one, I would say, Stick to it and use it, notwithstanding what editors and correspondents may say, even if it were ferro-prussiate. A man who is constantly changing his work at the instigation of writers, who, very often, have no practical knowledge of what they are writing about, will not do much good work. At the same time, I would venture to follow the practice of these writers, and advise a little variety now and then, otherwise a negative, that will print well in a process not in use might possibly be thrown away. My practice is to print rough proofs in matt P.O.P. and judge of the values of the negatives, and I can then see whether they are worth preserving or not. Say the print is rather flat, I can intensify, if there is any detail in the shadows, and then try again; but, should there be large masses of clear glass, I always consider the case hopeless. Then, again, the negative may be thin and slightly fogged. In this case intensification would be hopeless, as the fog would be increased. By the use of bromide paper a fair print might be got; but, the only possible way of making really good use of such a negative, in my opinion, is by making a transparency on a very slow plate and from that a new negative. To those of you who have not tried this method the result will, I think, come as a surprise. The great contrast obtained on transparency plates, so often a cause of anxiety, in this case comes as a blessing. On the other hand, should the negative be very hard but full of contrast, the better way would be to make a transparency on a rapid plate, and from that a new negative, when the values may be wonderfully altered. Should you, however, think of trying carbon, I should not recommend you to have your negatives thin, or the resulting prints will be apt to disappoint you.

(*To be continued.*) LESLIE SELBY.

IMPORTANT COPYRIGHT DECISION.

GAMBIER BOLTON *versus* CECIL ALDIN.

ON Saturday last, in the Court of Queen's Bench, before Mr. Justice Grantham (without a jury), this important copyright action was brought to a most successful conclusion.

Mr. Gambier Bolton, the well-known animal-photographer, sued Mr. Cecil Aldin, the artist, for damages, penalties, and an injunction for copying one of his animal studies in the *Sketch* last January, and also asked for an injunction against Messrs. Ingram Brothers, the proprietors of the paper in question.

It was proved in evidence that defendant had used Mr. Gambier Bolton's photographs on three occasions within a few weeks of each other, and we give herewith the verdict of Mr. Justice Grantham:—

"There can be no doubt that in this case the plaintiff is entitled to an injunction, and is also entitled to penalties and damages.

"It is first of all alleged, on the authority of the case of Hanfstaengel *versus* Baines & Co., that this does not come within the Copyright Act because it is not exactly of the same size as it was photographed by Mr. Bolton, and does not represent the same idea that would pass through the mind of a person looking at the *Sketch* as it would to the mind of a person if he were looking at this particular copyrighted work. I cannot agree with that argument at all. Of course, in the case that Mr. Kemp alluded to, the sketch was an entirely different one (Mr. Justice Grantham then went thoroughly into the 'Living Pictures' case). In this case the allegation is that the picture *itself* has been copied, and that it is nothing but a reproduction of the picture or photograph copyrighted by Mr. Bolton. I can have no doubt whatever that the picture in the *Sketch* is a pure copy, and a very good copy, of the plaintiff's photograph; and, if that is so, in my judgment it is a clear infringement of his rights.

"It is very important that the public should know that artists who prepare these drawings for the illustrated papers, which are now so much in vogue and are sold so very largely, have no right to take pictures which have been copyrighted by the authors and reproduce them as their own; because the world, or the 50,000 or 20,000 people, or whatever the number may be who buy these papers, and a great many thousand more people who would see the papers bought by others, would assume that this picture of the tiger was an original sketch or was by Mr. Cecil Aldin; whereas, as a matter of fact, it was not by him at all, but it was simply done in his room, copying from something which had been done by Mr. Bolton. Under these circumstances, I am clearly of opinion that there is an infringement of the copyright.

"The next defence is, that the defendant was authorised and induced to do it by a circular issued by Mr. Bolton, containing a list of various photographs which he had taken, or rather containing a list of *some* of those that he had taken. It so happens that this one does not appear there at all, therefore that argument falls to the ground. It does not appear there at all; but, taking it as though it referred to *all* these photographs, I cannot for a moment assume, because it says 'invaluable to artists,' that therefore artists are to pay a shilling for them, and then copy them and bring them out as their own, because that is exactly what the defendant did in this case.

"Therefore, under these circumstances, my judgment must be for the plaintiff on both grounds, and on all the grounds alleged by the plaintiff, and against the defendant upon the grounds raised by his learned Counsel.

"Under these circumstances the question is, as to what damages should be given. With regard to the damages in this particular case, it certainly seems clear that the sale of this particular photograph has been stopped. There is distinct evidence to that effect. The price of it is a shilling, and the price of larger copies more. What damage has been sustained it is, of course, very difficult to assess, but some particular sum must be assumed, partly as compensation to the plaintiff, and, no doubt, to show what view the Court takes of plagiarisms of this nature, and to prevent its being done in future. The penalties are 10*l.* for each copy. The defendant has only made one copy, and it is rather difficult to say exactly to what extent he might be liable where a copy is reproduced in great numbers with his name attached to it; but I think justice will be done in this particular case if I give judgment for the plaintiff for the sum of 10*l.* penalty, and 40*l.* for damages."

Mr. Kemp, Q.C.: Forty pounds, my Lord!

Mr. Justice Grantham: Yes.

Mr. Willes Chitty: Of course, I shall contend, if necessary, that the defendant is liable for all the copies produced in the *Sketch*, because the words of the Act are 'or procure to be sold.'

Mr. Justice Grantham: Yes.

Mr. Kemp: Will your Lordship give us a stay for seven days?

Mr. Justice Grantham: I confess I do not see why I should. I do not think so.

Mr. Kemp: No stay, my Lord?

Mr. Justice Grantham: No.

Mr. Willes Chitty: I ask your Lordship for costs.

Mr. Justice Grantham: Yes.'

Much amusement was caused by the way in which, on one or two occasions, the plaintiff, whilst in the witness box, scored off Mr. Kemp, Q.C., defendant's counsel. On handing to the Judge a copy of his original print of the photograph in dispute, Counsel rose to his feet and loudly protested against the print being admitted as evidence, as it was not a photograph at all, but an engraving, and on the witness asking Counsel if he was prepared to swear to this, and receiving no reply, he informed the Court that it was only a *bromide print*, and Counsel sat down disappointed.

Shortly after this incident, Counsel held up one of Mr. Gambier Bolton's studies, and asked if this was one of his photographs of a tiger, to which came the ready response that he was not in the witness box for the purpose of giving Counsel a lesson in Natural History without a fee, but that he would like to point out to the Court that there was a considerable difference between lions and tigers, and that the print in question was a study of a *lion!*

Plaintiff, admitting that he was pleased to think of artists using his studies as references, was asked by Counsel where, then, he drew the line, but he subsided amidst considerable laughter when plaintiff replied that photographic artists did not draw lines, but left that to "mechanics in art" like the defendant.

Later on, whilst Counsel was doing his utmost to convince the Court that defendant's drawing was not made from the plaintiff's photograph, he was met with the crushing rejoinder that the tiger in the disputed print had a cancerous growth in the mouth, which the photograph showed very plainly, and that the artist had actually traced this in, and had somewhat enlarged it, fancying that it was a part of the mouth itself.

After getting in a few forcible remarks as to the conduct of the defendant sitting in his comfortable studio at home and tracing photographs which had been obtained in all parts of the world at great risk, not only to health, but even on more than one occasion to life itself, the plaintiff left the witness box, and, after his witnesses had been examined, it was not surprising to hear defendant's Counsel say that he declined to call any witnesses on his side, although there were several present who had been in attendance for two days under subpœnas, and the case was brought to a successful issue by the verdict—described by many who were present as the "crushing" verdict of the Judge, who spoke with considerable warmth as to the grossness of the piracy.

This will prove a sharp lesson to the piratically inclined artist (well described by one of the witnesses as "a *mechanic* in art") and to the publishers who have so far supported them in different parts of the country, as it settles once and for all the important point, as Mr. Justice Grantham said, that any one taking a photograph has an absolutely complete control over it when copyrighted, that it is his own personal property, not to be used in any way without his consent, and that, in the event of any one stealing it, the Courts will support the copyright granted by the Government, and will award penalties and damages. Photographers in all parts of the world where the Act of 1862 is in force, and especially the Photographer's Copyright Union (which, however, took no part in the proceedings, as Mr. Gambier Bolton has only lately joined the Union), should be deeply grateful to him for having fought this action single-handed to the bitter end; and, although he was supported by such well-known animal-painters as Messrs. Nettleship and Wardle, and by such an authority and expert on photographic publication as Mr. Frank Bishop (Marion & Co.), it is to be regretted that not one of those who so constantly write and speak of photography as an art, although applied to, could be induced to support him in a case of such vital importance to all who practise photography. His well-earned victory has thus been won single-handed, and we heartily congratulate him on bringing the case to such a successful issue.

In addition to the above-mentioned case against Mr. Aldin, Mr. Gambier Bolton has obtained damages to the extent of 20*l.* from the proprietors of *Lloyd's Weekly Newspaper*, with an apology, for having used h photograph of an Australian crane with a wooden leg without his knowledge or consent. On payment of this amount he has stopped all further proceedings, and the following apology appeared in *Lloyd's Weekly Newspaper* last Sunday:—

"The Crane with a Wooden Leg.—We regret to have published in our issue of April 14 a reproduction from Mr. Gambier Bolton's copyright photograph of *The Crane with a Wooden Leg*. Our attention having been called to the fact, we willingly acknowledge our error. Mr. Gambier Bolton's animal studies are so widely known that this acknowledgment is due to him for what is, without doubt, a valuable property."

With reference to these two cases, Mr. Gambier Bolton writes: "My many photographic friends will, I feel sure, forgive a little 'trumpet-blowing' on such a memorable occasion as this. To have successfully carried through two important copyright actions within three days, to have obtained such a clear and forcible judgment as that delivered by Mr. Justice Grantham, to have taught the leaders of the new illustrated journalism such a sharp lesson, and thus to have strengthened the hands of the Copyright Union (to whose solicitors all credit is due for the result of my action against *Lloyd's Weekly*) is a state of affairs not likely to happen again in the lifetime of the average man; and although naturally anxious as to the result at times, through all the incidental worries I have been sustained by the thought that my cause was a just one, and that, although there had recently been verdicts as to the reading and meaning of the Copyright Act, which had caused great uneasiness to photographers in this country, yet if I could but get a hearing before a Judge who would listen to my explanations of the difficulties of our work, the right that we claim to be treated exactly on the same footing as the artist, and that the piratical, parasitical, mechanic in art' who stole the result of our labours was as guilty of crime as he who steals my watch or purse, then all anxiety as to the result of these actions would be at an end. And this has taken place exactly as I foretold, our negatives are admitted to be '*a valuable property;*' in future we can claim to be judged as artists—for, after all, it is not the paint brush, engraver's or sculptor's tool, or the camera that produces artistic results, but the man using them—and, although photography may never be true art (a fact that a few of us admit) yet our position from to-day is improved; we move up a step or two higher, and, although we may have discarded soft hats of the brigand type, red neckties, and 'low-watermark' collars, we shall none the less be able to carry our heads the higher, and to face the pirate who steals our work with good courage, certain of obtaining justice and whilst glorying in his downfall.

"And for what I have been able to do for our art-science to-day I would ask, and I hope not in vain, for three things. First that the name of the Photographers' Copyright Union be altered at once, as I have already given notice, to the Photographic Copyright Union; then that its doors be thrown open to all alike, that the miserable little jealousies which still bolster up the titles 'Commercial' and 'Amateur' photographer be swept away, and that all should stand on exactly the same footing; and, lastly, that photographers in all parts of the world where the Act of 1862 is in force should send in their names at once as members of the Union, and so strengthen our hands in our fight against those who steal our works."

BIRMINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION.

This Exhibition was opened by the President of the Society Sir Benjamin Stone, and is the tenth held by the Society. While there is no available room that may be said to be actually suitable for an Exhibition of Photographs in Birmingham, the local Society are to be congratulated upon their move this year to the Assembly-rooms, where the screen arrangement they adopted secured excellent lighting for all the works. On first entering the room, the fact that only one-half of the exhibits could be seen at a glance made the Exhibition look somewhat small at first sight as compared with that of last year, and, while the actual number of exhibits was about fifty less than upon the last occasion, we incline to the opinion that there were fewer works than usual the omission of which would have tended to strengthen the show. The Judges were Messrs. Cembrano and Lambert, together with E. R. Taylor, the head master of the local School of Art, whose services were available on the art side only.

Awards.

Class I.—Landscape, Large (Open).—The first award is to a very successful local worker, W. T. Greatbach for *Autumn*, a subject of simple character, a rough rushy foreground, a few nearly bare alders and wooded distance. Printed in silver platinum toned, slightly marred by the water line being out of the horizontal. No. 14, a bromide, *Ploughing*, by G. Wilkes, which receives honourable mention, has good pictorial qualities, the disparity in size between the leading and rear horses, emphasise the desirability of using as long a focus lens as possible. *In Chelmsley Wood*, by A. R. Longmore, and an *Open Landscape*, by D. Adair, are worthy of note.

Class II.—Seascape (Open).—Here we think the Judges have not erred on the side of leniency in withholding the prize. The workers are so

centrally situated in Birmingham they have small opportunity for seascape work, but some few of the pictures shown, we think, would hold their own in any such class. *A Tempestuous Morning*, in platinum, by W. T. Greatbach, being a notable and highly successful work, the weak spot perhaps being the rocks on the left. *The Fishing Fleet at Anchor*, by C. J. Fowler, pleased us, and the same exhibitor's *Armed Knights*, Land's End, has strong claims to notice in another direction. There is a charm about the quiet simplicity of *A Lonely Shore*, by Smedley Aston, and *The Restless Sea*, by Wallace Heath, has claims to notice. The second award is to E. Underwood, for No. 41, a subject strong in the clouds, but too weak to give us pleasure, and, we think, less to be preferred to the same exhibitor's other work, No. 42.

Class III.—*Genre* (Open).—Here, again, the Judges withhold the medal. "*Are the Pilchards in?*" by C. J. Fowler, receives honourable mention; it is a good rendering of a simple and natural subject, free from artificial elaboration. *Ye Jolly Friars*, also mentioned, is a work we have little sympathy with, being too heavy and ill trimmed. *Forty Winks*, by H. W. Cottrell, is one of those sham interiors which, if attempted at all, should be approached with the utmost care and a thorough knowledge of perspective. The subject is one demanding two vanishing points only, but the photographer and the background artist, between them, have got in about a dozen. The confusion may be possibly imagined, but cannot be described. *The Mystery of Life*, by Hall Edwards, is here, as also *Flora*, a clever little model seated upon a swing, the supports of which are entwined with what we at first thought was Virginia creeper, but, as it is apparently throwing out spikes of lilac bloom, we are probably mistaken.

Class IV.—Exterior Architecture.—E. Underwood receives the medal for *An Oxford College*—Oriel, we believe—and the peculiar colour this worker secures well suits the crumbling masonry. *South Porch, Gloucester*; by C. J. Fowler, and also his *Feathers, Ludlow*, are good. *A Kentish Home*, by E. R. Ball, is a well-known Cheddingstone subject, which we have seen better treated.

Class V.—Enlargements.—*On the Isis*, by moonlight, is an effective work, printed in a sepia tone, by H. P. Clifford, the subject being the well-known Iffley Mill. *Wild Wales*, an enlargement from Smedley Aston's well-known work, is delightful, and must have run the winner close. *A Portrait*, by the same worker, is good in gradation, but marred by unpleasant expression. *Evening*, by Hall Edwards, *A Dresden Shepherdess*, by W. H. Palmer, and a *Winter Scene*, by A. Miller, are good, while the *Higvorashimon, Nikko, Japan*, is interesting, but should have had some figures to have given a sense of proportion.

Class VI.—Instantaneous.—A weak class, and no award, a set illustrative of *Rugby Football* being fairly good.

Class VII.—Lantern Slides (set of 6).—A very strong competition, and, the Judges being unable to separate the first two, Messrs. Baynton & Jaques, they each take an award. Of C. S. Baynton's set, *Doorway Beauchamp Chapel* is a strong slide, as also *The Tomb of Robert Dudley*, and the *South Aisle*, Lichfield. Of E. H. Jaques set, Caernarvon is the best, supported by two frost scenes. One slide in this set, a kind of luminous cow, is a strange example of tampering with nature; originality is a feature to be encouraged, but the introduction of more than one sun into the same picture is so strangely at variance with nature, that we venture to doubt the advisability of Judges by their awards encouraging such daring. In the commended set by G. Wilkes, *Sliding* was the best supported by *Harvesting*, and a distant landscape with cows, but *Ilfracombe Harbour* is altogether too heavy and exaggerated. The sets by C. J. Fowler and Smedley Aston were also good.

Class VIII.—Landscape without Buildings.—A small class containing some good work. The winning picture, *Harvesting*, by G. Wilkes, a bromide uranium-toned enlargement, is quite a success, largely due to the accident of the horses being white. *A Winter Scene*, by W. T. Greatbach, is commended; the composition is good, but some effect is lost by the extreme whiteness of a large expanse of the picture. A set of three by W. Jones are interesting as showing the devastation wrought by the tornado that recently visited the Midlands. *In the Wood*, by Hall Edwards, and a Welsh landscape, by Smedley Aston, are also good.

Class IX.—Clouds—has usually been a very strong class with the Birmingham Society, but this year there is no award. Generally speaking, the exhibits are easy subjects—a strong light breaking through heavy clouds, and all too heavy and black. The *Sunsets*, by W. T. Greatbach, are perhaps the best, but the colour is somewhat objectionable; two *Evenings*, by C. J. Fowler, are good, but a heaviness pervades the whole class.

Class X.—River Scenery—is, as was the case last year, the strongest class in the Exhibition, and scarcely contains an unsatisfactory work. *A Bit on the Cole*, by A. R. Longmore, takes the medal; another by the same competitor receives honourable mention, and these are supported by another good subject by the same worker. They they are all spring subjects, showing trees nearly bare, and thus present a strong contrast to the *Wild Wales* of Smedley Aston, whose work is noteworthy. *Lion's Head, Dovedale*, is the best of a series by C. J. Fowler, and *River Scene*, by T. Taylor, the same subject as one by Mr. Longmore, is a success.

Class XI.—Stereoscopic.—At length, after three efforts, a certain amount of success seems to have attended the introduction of this class, and there is a fair exhibit. The *Alhambra*, by W. P. W. Browne, gains the medal, the rows of columns and arches making a striking subject for the stereoscope, and another wonderful effect is one by Mr. Longmore of a hanging basket bearing a growing plant, which throws out numerous tendrils. The river scenes by S. Aston are successful also.

Class XII.—Portraiture.—The medalled work is a child's head by Hall Edwards. The second string by the same exhibitor, which is commended, we much prefer as an example of portraiture, although it has the appearance of being too much cut down. A portrait by W. T. Greatbach is rather too red in colour to be entirely pleasing. *A Rising Socialist*, by P. T. Deakin, is fairly successful, as also is *A Cornish Fishwife*, which might rather be looked upon as a *genre* subject. As a whole, the class is distinctly less successful than last year's.

Class XIII.—Interiors—is usually a strong class, and this year is fully up to the average. *The Ambulatory, Tewkesbury*, by E. Underwood, secures the award, but must have been run close by the Chester Cathedral of W. T. Greatbach, the latter being a most artistic work, the screen standing out in bold relief against the hazy distance of the chancel. *The Triforium, Gloucester*, is an excellent technical work, and the same may be said of *Entrance to Beauchamp Chapel*, by C. S. Baynton, *Chester Screen*, by G. H. Sheaff, and *Gloucester*, by G. F. Lyndon.

Class XIV.—Landscape (small).—A successful *Eventide*, by H. C. Manton, carries off the medal; it is a nice, quiet work, of reedy foreground, a few trees, and single figure, which, together with an admirable sky, make a successful work. No. 294, by T. J. Davis, and No. 305 are among the most successful of the remainder.

Class XV.—Hand Camera.—A strongly artistic *On the Thames*, assisted by *Harvesting*, and a landscape, enables G. Wilkes to secure the medal in this class. A set of street scenes by H. C. Manton are excellent as such, and the series Nos. 316 to 319, by A. E. Busby, are most interesting, especially to the doggey man.

Class XVI.—Flowers.—This class shows a great falling off from last year; the medal is withheld, but Hall Edwards secures a mention for his study, and G. F. Lyndon's *Himantophyllum Miniatum* is distinctly good.

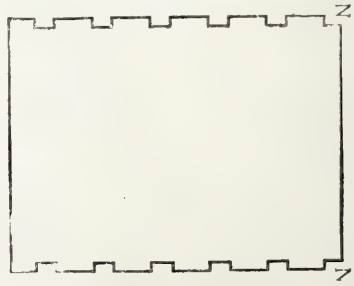
Class XVIII.—Novices.—The sets of P. T. Deakin and B. Moore are bracketed equal.

Class XIX.—Photographs not included in other classes.—*Watergate Row, Chester*, by W. T. Greatbach, is an extremely clever work in sepia carbon, and well deserves the award. *Ripple*, by C. J. Fowler, is good, but wants a sky. In No. 387 we find another example of attempting to improve upon nature. The subject is a thrush's nest, shown where no thrush would ever build, and containing *seven* eggs, which the thrush never laid. It is only fair to assume it obtains the award as a photograph, and not for the improvement.

In addition to the above, there are three classes in connexion with the Warwickshire Survey, one award being withheld, and the others being made to W. T. Greatbach and R. C. Cartwright. Each evening lantern exhibitions have been given by: F. P. Cembrano—*Spain;* H. Sturmey—*Switzerland;* Harold Baker—*The Avon;* F. Iles—*Photo-micrography, The Competition Slides;* and Hall Edwards—*Instantaneous Photography*, the attendances at which have been highly satisfactory.

THE FRENA FILM-HOLDER.

This Holder is not unlike to that of a camera dark slide, and like these it can be fitted to any tripod camera. It carries twenty, or any smaller number of cut films and changes them automatically. Up to the present time only two sizes, half-plate and quarter-plate, appear to have been



issued, but when a demand for other sizes has been created they will, doubtless, be supplied. The Frena system, as we have frequently had occasion to explain, recognises the edges of the films being notched, and it is on this that the ability of changing the films in succession depends.

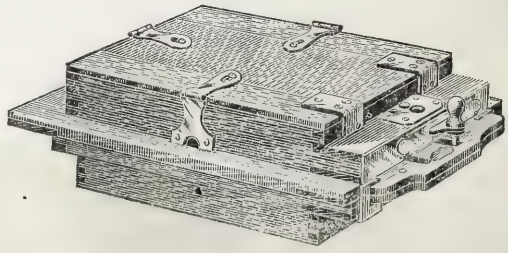


Fig. 1.

The holder in its entirety is shown in fig. 1. In this state, it is ready

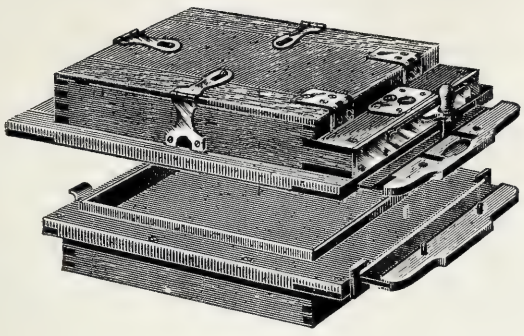


Fig. 2.

to be adapted to the camera by planing down the edges. From fig. 2 it will be seen that the Holder consists of two parts, a Magazine and a Receiver. Each of these parts is about half as thick again as an ordinary dark slide. The Magazine contains the pack of films to be exposed, and is fitted to slide into the rebate of the camera. The exposed films are deposited and retained in the Receiver. The exposure is made in the same way as an ordinary dark slide. The shutter draws completely out as in the best American camera slides. When the exposure has been made, the foremost film is transferred from the Magazine into the Receiver. This is effected by folding the Magazine and the Receiver face to face, as shown in fig. 3. When the two receptacles are thus adjoined, the shutter of the Magazine

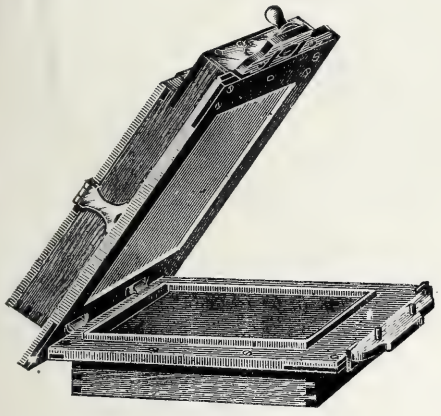


Fig. 3.

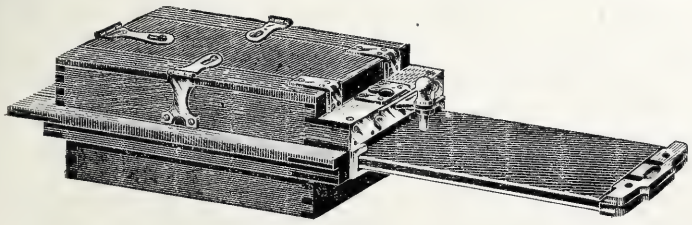


Fig. 4.

interlocks with the shutter of the Receiver. The two shutters are thereupon drawn out together as far as they will go, as shown in fig. 4. Then, when the Holder is held in an approximately horizontal position with the Receiver underneath, the change button is pushed to one side. This separates the foremost film, which falls, through the open shutters, from the Magazine into the Receiver. Pushing in the shutters completes the operation of film-changing.

On the discharge of the exposed film from the Magazine, the next succeeding film of the unexposed series automatically takes its place in the plane of the focal register, being carried forward by a spring-pressure board. Thus the entire pack of unexposed films is never released from that gentle pressure which is required to keep these thin and flexible supports perfectly flat, and thereby capable of receiving the sharpest possible image from the lens.

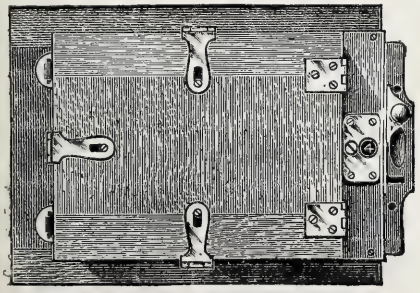


Fig. 5.

There is a self-acting counter upon the back of the Magazine (fig. 5) which shows at a glance how many pictures have been taken, and which film of the series is in position for the next exposure.

The film-holders are admirably made, being constructed by machinery which eliminates the personal equation in their formation.

Our Editorial Table.

Ross & Co's. New Catalogue.

The new 1895 catalogue of Messrs. Ross & Co., 111, New Bond-street, is a handsome, well-illustrated and printed volume, which reflects credit on those concerned in its preparation. All the well-known lenses of the firm's manufacture are fully particularised, special prominence being given to a new series for hand-camera and stereoscopic work, working at *f*-8 and *f*-5·65. Instantaneous shutters; hand and stand cameras of the latest types; projection lanterns for scientific, as well as for enlarging, and other purposes; microscopes, and their accessories, in great variety; telescopes; opera glasses; barometers; and many other philosophical instruments, receive attention in the catalogue, which may also be said to epitomise the innumerable minor requirements of the modern photographer. It is issued at a cost of sixpence post free, and is well worth the money.

We have also received the catalogue of Mr. F. V. A. Lloyd, 5, South John-street, Liverpool. In the course of about one hundred pages it sets forth prices and particulars of every description of photographic apparatus, sundries, chemicals, &c.

News and Notes.

Royal Photographic Society.—Photo-mechanical Meeting, Tuesday, May 21, at eight p.m. *Apparatus for Process Photography*, by Mr. Wm. Gamble.

From an announcement in our advertising pages we find that Messrs. Marion & Co. have a cheap sale on in connexion with their annual stocktaking. This will prove a good opportunity for securing bargains.

The Britannia Works Company have purchased the business and good-will of Mr. Austin Edwards, maker of the "Queen" plates and films, and they will henceforth manufacture Ilford films and Ilford process plates.

West London Photographic Society.—The Sixth Annual Exhibition of members' work will be open on Friday and Saturday, May 17 and 18, 1895, at the School of Arts and Crafts, Bedford Park, Chiswick, W. Friday, May 17, four p.m. till ten p.m., exhibition of pictures and lantern slides. Saturday, May 18, four p.m. till nine p.m., exhibition of pictures and lantern slides. Cards of invitation can be obtained of the Hon. Secretary on application.

The "Kodak News."—This is the title of a new monthly journal of eight pages for those "interested in the science and art of photography." It is issued by the Eastman Company, 115, Oxford-street, W. The first number has as frontispiece, a drawing of a young lady "making her bow," and the literary contents, which are likely to be of service to Kodakers, include "Hints on Photographing Groups," "Kodaks as Enlarging Cameras," and other interesting items. The *Kodak News* is smartly got up.

The Shrewsbury Meeting of the Convention of the United Kingdom.—The following circular has been issued:—"I am instructed by the Council of the Photographic Convention of the United Kingdom to call your attention to the forthcoming meeting at Shrewsbury, which will be held during the week commencing July 15, 1895. An Exhibition will be held, and I shall be very glad to hear from you, at your earliest convenience, whether you purpose sending any of your specialities and latest novelties. The Exhibition Hall is well adapted for the purpose, and the charge for wall and table space is very low. A larger attendance of professional and amateur photographers from all parts of the empire is anticipated than at any previous Convention meeting. R. P. Drage, Hon. Secretary, 95, Blenheim-crescent, W."

Percy Lund & Co., Limited.—This Company has just been registered, with a capital of 10,000*l.* in 10*l.* shares, to acquire, take over as a going concern, and carry on the business of a printer, publisher, stationer, lithographer, photographic material manufacturer and merchant, magazine proprietor, and otherwise, now carried on by Percy Lund at 5, Godwin-street, Bradford, and at the Memorial Hall, Farringdon-street, E.C., as Percy Lund & Co., and to adopt a certain agreement for that purpose. The subscribers are:—Percy Lund, Publisher, 43, Athol-road, Bradford; Edward W. Humphries, Publisher, 9, Devonshire-terrace, Bradford; Miss Lucy Lund, Wharfe View House, Ilkley; John W. Buckle, Dyer, 286, Southfield-lane, Bradford; Charles Lund, Accountant, Ilkley; Leopold Becker, gentleman, Westbourne-park, Scarborough; George E. Wainwright, Government Clerk, Edgeborough-road, Guildford, one share each. The number of Directors is not to be less than three nor more than five. The subscribers are to appoint the first; qualification, 100*l.*, remuneration as the Company may decide. Registered Office, 5 Godwin-street, Bradford.

BOSTON CAMERA CLUB PRIZE COMPETITION.—The Boston Camera Club, representing a gentleman of high standing in matters pertaining to aerial navigation, is authorised to make the following offer of prizes for instantaneous photographs of large soaring birds:—A prize of 100 dollars is offered by the Boston Camera Club for the best instantaneous photograph of a large bird in the act of soaring. An additional prize of fifty dollars is offered for the greatest number of instantaneous photographs, offered by one photographer, of large birds in the act of soaring. By "soaring" is meant the attitude of the bird in the air when no wing motion is apparent. The purpose for which the photographs are desired—namely, the study of wing angles and a possible movement, unappreciable to the eye of the observer—necessitates that the figure of the bird should be at least half an inch long on the print. If the figure is small, but clearly defined in detail, enlargements will be preferable to contact prints, and will be judged of equal merit with direct prints. Careful notes should be written on the back of each picture, detailing the appearance to the eye, the quickness of the shutter, the angle of camera, &c., also the full name and address of the contributor. Two prints of each picture should be sent. All contributors must prepay the transportation charges of their exhibits (which may be simply card mounts), and in no case will they be returned. Photographers throughout the world are cordially invited to compete. This offer remains open until October 1, 1896; but, if on that date at least 100 different photographs have not been received, the limit of time may be extended, of which due notice will be given. The Club freely offers its galleries for the exhibition of the pictures submitted, and pledges its best efforts to select Judges fully competent to decide upon their merits and to make the awards. All contributions should be sent to the Boston Camera Club, 50, Bromfield-street, Boston, Mass., U.S.A., and marked "Cabot Competition." For further information apply to Mr. Samuel Cabot, care of Boston Camera Club, at above address.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 9088.—"Improvements in and connected with Apparatus for Retouching Photographic Negatives and the like." Complete specification. C. B. MORTLAND.—*Dated May*, 1895.

No. 9114.—"Improvement in the Material and Manufacture of Photographic Printing Screens, Masks, or Films." J. ROBINSON.—*Dated May*, 1895.

No. 9149.—"Refractive Stereoscopic Attachment to Single Lens Cameras." S. G. BROWN.—*Dated May*, 1895.

No. 9226.—"Improvements in View Finders for Photographic and similar purposes." G. DICKINSON.—*Dated May*, 1895.

No. 9227.—"Improvements in View Finders for Photographic and similar purposes."—G. F. FRAAS.—*Dated May*, 1895.

No. 9236.—"Improvements in Photographic Cameras." J. STUART and S. MUGGERIDGE.—*Dated May*, 1895.

No. 9243.—"Improvements in Apparatus for Producing an Instantaneous Flashlight for Photographic purposes." C. A. MCEVOY.—*Dated May*, 1895.

No. 9245.—"An Improved Photographic Lens Shutter." A. L. LAMBERT.—*Dated May*, 1895.

No. 9377.—"An Improvement in Photographic Cameras." E. C. HAWKINS.—*Dated May*, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, rockwork accessory, will give interior and exterior background.—Address, RIGBY, 12 and 13, Eustace-street, Dublin.

Will exchange Ross's No. 3 *carte* portrait lens for 9×7 rapid rectilinear, or whole-plate, or 10×8 hot roller.—Address, H. BULLOCK, 48, High-street, Crewe.

Wanted, whole-plate camera set, will give in exchange two or three backgrounds. Photographs sent.—Address, R. W. MURDOCK, 34, Victoria-street, Dublin.

Exchange astronomical telescope, three and a half inches, O. G., value eighteen guineas, for Ross's 12×10 universal symmetrical.—Address, L. WARD, Photographer, Hounslow, Middlesex.

Will exchange head-and-body rest (as new) for balustrade and pedestal. Also rustic oak garden chair for studio chair or table.—Address, D. T. FIELD, 25, Linwood-road, Handsworth, Birmingham.

Will exchange bar burnisher, printing frames, Fallowfield's 12×10 studio camera, fitted with Cadett's pneumatic shutter, for Ford-Smith's hot roller and universal whole-plate studio camera; difference in cash.—Address, BALDWIN'S Studio, Princes-buildings, Bath.

Wanted 8×10 field camera, lens and slide; will exchange 24×15 Woods Washer as new, to wash 500 cabinets at one time; also second-hand cabinet portrait lens, two and a quarter-inch diameter by about ten and a half-inch focus.—Address, H. M. RUMBLE, Photographer, Basingstoke.

Wanted to exchange a whole-plate camera, double extension, latest movements, three double backs, rapid rectilinear lens, Iris stop, tripod, and a waterproof case, quite new, for a whole-plate Lancaster's Instanto, or exchange rapid rectilinear lens and half-plate lens for whole-plate Instanto lens, or exchange for a good half-plate set.—Address, J. COX, 26, Edward-road, Clarendon Park, Leicester.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
20.....	Camera Club	
20.....	Leeds Photo. Society	Demonstration with Otto and Presto Papers. H. Denison.—Demonstration with the Air Brush. R. Bownas.
20.....	North Middlesex	*Reducing Negatives.* J. McIntosh.
20.....	Richmond	
20.....	South London	*Isochromatic Plates—their Use and How to Work them.* W. H. Barnes.
21.....	Birmingham Photo. Society ..	
21.....	Brixton and Clapham	"Architecture" Competition Slides.
21.....	Gospel Oak	*On the Use of the Hand Camera.* Mr. Beyer.
21.....	Hackney	
21.....	Hastings and St. Leonards	
21.....	North London	*Enlarging.* H. M. Smith.
21.....	Paisley	
21.....	Rochester	
21	Royal Photographic Society ..	*Apparatus for Process Photography.* William Gamble.
22.....	Croydon Camera Club	*The Carbon Printing Process.* G. W. Jenkins.
22.....	Leytonstone	
22.....	Photographic Club	*The Talbotype Process.* Frank Haes.
22.....	Southport	*Toning Bromides.* C. F. Depree.
22.....	Stockport	
23.....	Camera Club	
23.....	Glossop Dale	
23.....	Hull	
23.....	Ireland	Annual Meeting.
23.....	London and Provincial	*Colour Photography by the Lippmann Process.* R. Child Bayley.
23	Oldham	
23.....	West London	
24.....	Cardiff	
24	Croydon Microscopical	*New Combined Toning Bath.* Mr. Sparrow.
24.....	Holborn	
24.....	Maidstone	
25.....	Birmingham Photo. Society ...	Excursion: Lapworth and Packwood. Leader, J. T. Mousley.
25.....	Croydon Microscopical	Excursion: Hartfield and Withyham. Leader, Mr. Roods.
25.....	Hull	
25.....	North Middlesex	Excursion: Chorley Wood for Chenies.
25.....	South London	Excursion: Beddington. Leader, Mr. Gunthorp.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 14,—Ordinary Meeting,—the President (Sir H. Trueman Wood, M.A.) in the chair.

A large number of nominations for membership were read, and several candidates were elected. It was also stated that the Council had admitted several members to the Fellowship of the Society.

The PRESIDENT observed that it must be very satisfactory to the members to know that the Society was so largely increasing in membership.

It was announced that the Weymouth Photographic Society had been admitted to affiliation.

The names of the Judges, elected by the members, for the forthcoming Exhibition of the Society were stated by the President to be as follows:—In the Art Section: Mr. W. L. Colls, Colonel Gale, Messrs. F. Hollyer, B. Gay Wilkinson, W. L. Wyllie. Technical Section: Captain Abney; Messrs. Chapman Jones, Andrew Pringle.

Mr. A. H. SMITH read a paper descriptive of *The Cyclograph*, and exhibited and explained the action of the instrument. It enables photographs to be taken of the whole or any part of a cylindrical object. The camera and lens are employed as usual. The object to be photographed is placed on a suitable turntable and caused to travel across the axis of the lens in such a way that as it advances it also turns on its own axis, like a wheel in contact with a plane surface. At the same time, a dark screen, in which is a narrow slit, travels on a parallel path, at a proportionate speed, in such a way that each successive point of the circumference of the object is exposed on the plate when it is at the cusp of a cycloid, *i.e.*, when its movement is infinitesimal. The instrument consists of a dark screen, travelling in a groove in a substantial bed, actuated by a long steel screw of fine pitch. The screen has a slit of adjustable width, and is shaded by a hood, which connects the slit with the camera. Attached to the bed is a plane table, travelling on parallel guides, and covered with patent plate glass. A finely turned and polished turntable travels on the glass between two parallel guides, at an adjustable distance from the screen. The relative movements of the parts are regulated by a steel rod, working in brass bearings. Mr. Smith showed photographs of vases obtained by "cyclographic" agency, and after appreciative remarks by the President, Mr. Bolas, and Mr. Traill Taylor, was accorded a vote of thanks.

PLATINUM PRINTING AND TONING.

Mr. CHAPMAN JONES read a paper on *The Changes that Platinum Prints are liable to (apparent Fading and certain Toning Processes)*. This we shall take an early opportunity of reproducing. The principal points elicited by the author's experiments were that, in the case of browned or faded platinotypes, the prints and mounts contained iron and sulphur compounds, and that the prints could be restored to their original condition by treatment with hydrochloric acid and chlorine water, that the total removal of the iron from platinum prints was practically impossible, and that, in the process of toning prints by Mr. Packham's catechu method, it was the reaction of the iron with the tinctorial solution which produced the "tone."

Captain ABNEY said that the darkening of platinum prints might be produced by careless washing; some kinds of water would also conduce to it. He was surprised that so much iron was left in the paper as had been stated by Mr. Chapman Jones. As regards the catechu "toning" process, he did not call this toning, but staining. It was not a true metallic toning. He thought as good results might be obtained by treating the prints with coffee.

Mr. J. PACKHAM thought great benefit would be derived from Mr. Chapman Jones's paper, which had opened up new lines of experiment. As regards Captain Abney's remarks, the catechu process was a dyeing, not a staining, one. The ancients were particularly successful in getting depositions of dyes on metals.

Mr. J. WEIR BROWN said that, with the uranium toning of platinum prints which Captain Abney included among "staining processes," he had not been successful. In a silver print toned with uranium, however, there was a chemical change, so that that could not be called staining.

Mr. E. C. HERTSLET questioned whether a process could be called a "staining" one if the whites remained clear. He showed uranium and ferridcyanide of iron toned prints in illustration of his point, and drew attention to the fact that the action of the uranium on the platinum print was such as to constitute it an intensifier.

Mr. H. W. BENNETT remarked that it was correct to call Mr. Packham's process a staining one, inasmuch as part of a print that had been treated with the catechu solution had had the colour discharged by light.

Mr. W. THOMAS doubted the correctness of terming the process a staining one, when the action of a green solution was to produce a red tone.

Mr. CHILD BAYLEY in reference to Mr. Bennett's observation, asked if the gold toning of a silver print was to be called a "staining" process, because the image faded?

Mr. BENNETT replied that the platinum print was restored to its original appearance; there was no fading.

Captain ABNEY, in reply to the foregoing observations, still doubted whether the catechu procees could be called a true toning one, inasmuch as no substitution took place. A uranium-toned platinum print of Mr. Hertslet's, which showed pure whites, was a mystery to him. The presence of more iron in the shadows of the print than in the lights, as had been suggested, indicated the formation of a "lake"—not a true one, but one with the impurity.

Mr. CHAPMAN JONES, in his concluding remarks, cast doubt on the permanency of uranium-toned prints, and said that hydrochloric acid would not remove iron from catechu-toned prints.

A vote of thanks was passed to Mr. Chapman Jones.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 9,—Mr. J. Traill Taylor in the chair.

Mr. W. Ethelbert Henry was unanimously elected a member.

Mr. A. L. Henderson occupied the evening with a display of lantern slides made from negatives taken during his recent sojourn in Algiers. The slides, which numbered about 200, depicted scenes in the streets, mosques, hotels, the principal public buildings, and included several of interesting parts of the interior of the country. At the conclusion of the display Mr. Henderson was warmly applauded for the excellence of his slides, as well as for his kindness in consenting at very short notice to fill a gap that evening.

PHOTOGRAPHIC CLUB.

MAY 8,—Mr. F. Haes in the chair.

Mr. TOTTEM asked for information as to the most easy and effective method of cleaning lantern slide cover glasses. On account of their extreme thinness and freedom from colour, he preferred the French glass, but unfortunately it was the most difficult to clean. Out of the last half-gross he had, there were not more than half a dozen that cleaned readily; all the others had a bloom upon them, which had an effect upon the surface. Water, spirit, and whiting had been tried. The bloom was removed, leaving the glasses apparently clean by reflected light, but by transmitted light the marbled effect could be seen even when in contact with a transparency.

Mr. FRY suggested a solution of fluoric acid—1 drachm in 5 ounces of water; this would be found most effective.

Arising out of the discussion of last week, Mr. Fry now showed two carbon transparencies, one sensitised in a new bath, and the other in a bath nine months old. The fresh solution gave results in five to seven minutes, the old one in three-quarters of an hour, and even then he had to resort to the use of water. The difference between the two was very evident, the new bath giving a sparkling result. Answering a question, Mr. Fry said he had a bottle holding 66 ounces to the neck, in which he placed 2 ounces bichromate (original crystals of an orange colour ground in a mortar). If he found his sample of bichromate acid, he added 5 to 10 drops liq. ammoniæ.

MANCHESTER PHOTOGRAPHIC SCCIETY.

THE usual monthly meeting was held on Thursday, May 9, at 36 George-street, the President (Mr. H. M. Whitefield) in the chair.

The evening was devoted to the exhibition and discussion of various printing methods.

Mr. T. R. Cobley showed samples of Hardcastle's printing-out platinum paper. The printing is continued until the desired depth of image is obtained, which is not altered in the finishing of the print by washing in a weak solution of hydrochloric acid, followed by water.

Mr. W. Tomlinson had a fine display of platinum prints, ordinary finish, and others toned with Packham's solution, whereby sepia and other tones are readily obtained; also some prints on Eastman's platino-bromide paper, by which platinum effects are produced. This exhibit was made very instructive, prints from the same negatives being shown printed by the three methods.

Mr. A. E. Casson gave a working demonstration of Schölzig's Otto and Presto papers, with specimen prints by both processes. Samples of the papers were also distributed.

Mr. H. Smith exhibited a 10 × 8 enlargement from a "snap-shot" produced on Presto by daylight six hours' exposure in January last.

The PRESIDENT announced that, by an arrangement with the Lake District Camera Club, Windermere, members of the Society visiting the district could have photographic facilities on application to the Hon. Secretary.

Brixton and Clapham Camera Club.—May 7, Mr. J. W. Coade, V.P., in the chair.—Mr. W. THOMAS read a few notes on *Printing in Platinotype*, treating specially the combination of skies with landscape subjects, and demonstrated the cold-bath process of development, and the latest method of toning platinum prints. A letter was read from Dr. Reynolds, President of the Club, resigning, though reluctantly and from circumstances over which he had no control, the office he has held since March, 1892. An album of members' portraits, collected and arranged by Mr. R. G. L. Phelps, was laid upon the table. It was decided that every member should receive a copy of each issue of *Photo Notes* in the event of that publication being continued. On Wednesday twelve members visited Brockwell Park at seven a.m., and several very effective sheep studies were secured, in addition to other subjects.

Croydon Camera Club.—The second annual rummage sale of members' photographic apparatus was held on Wednesday, May 8, and drew a large attendance. Mr. J. Allbright wielded the hammer with much success, a large number of lots changing hands. Some of the members who had received trial packets of the "Guegnier" dry plate reported their experience. Messrs. Maclean, Keough, J. Smith, and Corden concurred that the plate was of high rapidity, easy to work, and gave a plucky image with good gradation; in some cases the packing was slightly at fault. Several applications by ladies to join having from time to time reached the Secretary, it was resolved to consider whether a section for ladies could be arranged. The chief difficulty is the need of an energetic lady camerist to organize and manage the section.

Croydon Microscopical and Natural History Club (Photographic Section).—At a meeting held on Friday, May 10, the subject was a *Discussion on the Use of Starch as a Mountant*, opened by Mr. J. H. BALDOCK, F.C.S. In discussing this subject, it may be as well just to refer very briefly to what starch is, and its behaviour under various conditions. With the exception of some of the alga and lichens, starch occurs in almost all plants, generally in the form of colourless transparent granules, varying considerably in size, and in less degree in shape. The appearance of these granules under the microscope is characteristic, for there is seen a central spot called the kilum, which is surrounded with concentric rings. If the polariscope be now called into use, most of the grains will show a black cross having the kilum for its centre. But although so very widely distributed in nature, the varieties in commerce—and therefore those likely to be used by the photographer—are much more limited; thus in buying starch for mounting purposes, he is likely to be supplied with either that obtained from various species of canna (tous les-mois), or maranta arundinacea (arrowroot), or solanum tuberosum (potato), or triticum vulgare (wheat), or lœa mays (maize), or oriza sativa (rice). "The microscopical appearances (plain and polarised) of all these, together with authentic samples prepared by myself from the above plants, together with starches from peas, beans, chestnuts, orrisroot, &c., also prepared by me, I now show you. When starch is used as a mountant, it is of course necessary to bring it into a state of disintegration, *not solution*, because starch paste, as made, is not a true solution. The usual plan adopted is to make the starch grains into a cream with cold water, and then pour on, with constant stirring, boiling water till it thickens, about twenty parts of water to one part of starch being the proportion. If, however, the starch paste be subsequently boiled for a few minutes, more complete disintegration takes place, a clearer jelly is obtained, and better keeping properties secured. It is important not to have the starch paste too thick, otherwise it has a tendency to be lumpy when spread over the print. Professor Bothamley states that rice starch is to be preferred; but, after using all the kinds mentioned above, I am disposed to think that there is but little, if anything, to choose between them. There is one peculiar property of starch, which, though largely taken advantage of in the arts and manufactures, does not, for some reason or the other, seem to commend itself to photographers. The property to which I allude is that of its conversion, at a temperature of about 160° C. (230° Fahr.) into dextrine or British gum, in which state it is perfectly soluble in water. A viscid solution of this I have had by me for years, and it is perfectly good and usable now. The same change is effected by the action of various dilute acids, aided by heat, but the presence of these, though unobjectionable to the calico printer, &c., would hardly be esteemed by the photographer. With regard to the keeping properties of starch, which may interest those who do not care to go to the trouble of making it fresh every time, an objection I quite fail to appreciate, I may say, boil it well to start with, and then add a *small quantity* of some substance, such as boric acid, salicylic acid, oil of cloves, &c., and it will keep thus in a corked, wide-mouthed bottle for weeks or months. Alum has been suggested, but although it undoubtedly preserves the paste, its use cannot be recommended for photographic mounting. An objection has been raised against the use of starch as a mountant, on the ground that it contains gluten, which would be likely to cause an acid fermentation; but in none of the samples on the table to-night, numbering sixteen, and obtained from chemists, grocers, oilshops, and wholesale druggists, does this substance exist, neither could it, unless it originally existed in the plants from which the starch was obtained, and was intimately associated with it, taking wheat as an example. Mr. H. D. Gower said a question was asked in *Photography* for December 13, 1894: "Is the starch of commerce likely to be pure, seeing that it is not made for photographers, but for laundresses?" The question of purity in starch, as used by photographers for the purpose of mounting prints, is one that ought to be seriously studied. At the present time, where such keen competition exists in producing a commodity used, I might say, almost in all households, it stands to reason rapid methods of production, and, at the same time, economical ones, are bound to stand prominently in front of the old-fashioned methods. Considering that about seventy-five per cent. of starch exists in wheat, it seems curious that

photographers cannot prepare the mountant themselves of such a purity as to be independent of the manufacturer. The process of manufacturing starch is not one of the cleanest (as made on a large scale), but through its whole process there seems but little chance of impurities existing as regards laundry work, but many things have to be taken into consideration when used as a mountant for photographs. It is a question if the gluten which exists in the manufacture has been entirely taken out. To do this properly the utmost care has to be exercised in the operation. The acetious fermentation that goes on between the gluten and starch, and which has the effect of *eventually getting rid of the gluten*, may not be properly effected. The separation of gluten from starch is also brought about by adding caustic soda or potash. Starch is an excellent all-round mountant in its way, and it certainly is an open question at the present time whether it is the starch at fault or some impurity, such as gluten, that makes its presence felt at some time or other, for if the gluten has not been entirely taken out of the starch that has been used, and moisture is at any time, and in any way, imparted to the mounted print, slow fermentation is most likely to take place at the expense of the starch; or is this the only evil, as, by the decomposition of the gluten, we again get ammonia and acetic acid, which unite and form acetate of ammonia, the starch in its turn fermenting and forming lactic acid; therefore it is a question whether some preservative should not always be used in conjunction with starch paste. Starch may be made from the ordinary commercial variety or arrowroot, and any one who uses this mountant has an easily made and very clean medium, cheap and economical; but, after keeping a few days, it begins to go wrong. The cooler starch paste is kept when made, the longer will sourness and fermentation be resisted, but put into a warm place, then fermentation at once sets up. Numbers of preservatives have been given from time to time, some good, some bad. Salicylic acid is recommended by some, and it certainly does keep it good for a time, but after a week it begins to change, the acid really acting as a disinfectant. Alum is also recommended, but if used in sufficient quantity to place the starch beyond corruption, the paste is hardly fit to use for photographic purposes. A small sample which I place before you was made up on December 17, 1891, and is nearly the last of a quantity I made up, and which I have used from time to time since. It was made as follows (I will give you small quantities, so any member can try it for himself): One ounce of best white starch may be taken, put it into a basin, and add enough water to cause disintegration; afterwards it should be made up to about half pint of water, or less if a stiffish paste is required. It is then put into an enamelled saucepan or glass beaker, and put on the fire. A Bunsen burner or gas stove is to be preferred, as the process of thickening can be much better watched, and the flame regulated underneath. When the solution begins to turn, which can be seen from the transparent effect that it undergoes, at the same time constantly stirring, after it has turned and thickened, the heat may be continued for some minutes longer, and then the vessel removed from the flame. While quite hot, add half an ounce of pure glycerine, and well stir it in; after having cooled a bit it may then be turned out into a wide-mouthed bottle, and two or three drops of oil of cloves, or other essential oil to suit one's "smell," added, though this is not necessary, and finally, when nearly cold, about half an ounce of methylated spirit, and well shaken up together. Pure glycerine should be used, of a fairly high specific gravity; some samples not being entirely free from impurities. Price's patent glycerine is quite fit for the purpose, and should be perfectly colourless. Some makes have a curious taste, but this is not fit, and such samples should be discarded. Adding the spirit equalises the hygroscopic properties of the glycerine, at the same time holding any essential oil in a more soluble condition; as the starch is used the spirit will evaporate from it, when a little should be added from time to time, but not too much to make the paste too thin. Arrowroot and flour from different grain can be similarly treated, each containing more or less gluten. Mr. Baldock said that all starch was not made for laundresses, as large quantities were employed for toilet and nursery purposes, and it was worthy of notice that all the samples obtained from chemical sources were either wheat or maize, whereas the oil-shop and grocers' starches were almost, without exception, rice. It was very easy to make starch on a small scale, without any fermentation, by using caustic soda somewhat weaker than that of the pharmacopœia." Messrs. Grundy (Chairman), Rood, Harrow, and others took part in the discussion, the conclusion being that pure starch, freshly made, with a little preservative added, left nothing to be desired in the way of a mountant.

Gospel Oak Photographic Society.—May 7.—Mr. Stringer, of the Platinotype Company, gave a practical demonstration with their papers, which proved of great interest, and was much appreciated by the members. The cold-bath process is a great recommendation to many workers, as was proved by the ease with which Mr. Stringer developed his prints. Messrs. G. A. Powell and A. E. Marton were elected members of this Society, and, a vote of thanks being given to Mr. Stringer, the meeting was brought to a close. The next meeting will be held on May 21, subject, *On the Use of the Hand Camera*, by Mr. Beyer.

North London Photographic Society.—May 7, Mr. Walker in the chair.—Mr. W. BISHOP lectured on *Stereoscopic Photography*. Mr. Bishop explained the various implements and devices which had been invented for taking stereoscopic pictures with one-lens cameras, and pointed out the objections to which they were open beyond the fact that only objects not in motion could be taken with them. One of the chief of such objections was the risk that, in moving the camera for the second picture, the level of it might get slightly altered, and so the horizon line in the two pictures would not be the same. This would be fatal to the picture. Again, when separate plates were used, there was the difficulty of getting the two negatives of equal quality. He showed the magazine camera with two lenses which he used. It could be employed either as a hand camera or on a tripod. On the tripod he screwed a small square table with a spirit level fixed in it, and, this table being got level by means of the tripod, the camera was then placed on it. He then gave directions as to the cutting and mounting of the prints. At the next meeting, on the 21st inst., Mr. H. M. Smith will lecture on *Enlarging*.

Putney Photographic Society.—May 6, Annual General Meeting, Dr. W. J. Sheppard in the chair.—The following officers were elected:—*President:* The Hon. Baron Pollock.—*Vice-Presidents:* H. Kimber, M.P., John A. Hodges, and Dr. W. J. Sheppard.—*Council:* F. Chasemore, Dr. J. F. Farrar, H. Faulkner, T. Gilbert, W. F. Goring, W. C. Plank, Dr. C. Wyman, and Wm. Martin, jun. (*Hon. Secretary and Treasurer*). During the evening there was a general chat and discussion on cameras.

Bath Photographic Society.—April 24, Mr. Aug. F. Perren (President) in the chair.—Mr. W. T. Morgan and Mr. G. F. Chevasse were elected members of the Society. The CHAIRMAN stated that this meeting would be the last of the Lantern Evenings arranged for the Winter Session. The excursion *rota* would be issued shortly, and he hoped the summer outings would prove thoroughly enjoyable. He then asked Colonel Sealy to give his promised lecture, *Camera Work, Typifying the Uses of Hand and Stand Cameras*. Colonel SEALY commenced by urging those who had time and inclination to lose no time in starting photographic pursuits. He ever regretted the loss of pictures he could have easily secured in the Himalayas and elsewhere in India had he then been acquainted with the practice of photography. The lecturer described his apparatus, and, for all practical purposes, he used a stand camera, which he had so arranged that, by inserting this camera into a deal box, it was ready to do duty as a convenient form of hand camera, all necessary movements being available. Starting from Elmhurst, and depicting scenes in Batheaston, the lecturer took his audience into the hunting field, thence cricket and football scenes were depicted. Photographs of the treasures of the Zoological Gardens, the Household troops marching to the strains of the band, and other pictorial subjects familiar to Londoners; skating, hoar frost, and fishing illustrations followed. Views at and in the vicinity of Tenby added to the variability of the entertainment, additional interest being imparted as descriptive details were given. The lecture lasted nearly two hours, and considerably over a hundred pictures were shown. The management of the lantern was undertaken by Mr. Lambert, one of the Vice-Presidents. At the close of the lecture the Rev. E. A. PURVIS moved for a hearty vote of thanks to Colonel Sealy for his lecture and the great number of pictures he had prepared for the occasion. He (the speaker) had seen a good many slides, but never so complete a set as those exhibited that evening.

Darwen Photographic Association.—May 9.—The Darwen Photographic Association held their first annual meeting in Belgrave School, when prints sent in for the Album Competition were selected by ballot. The photographs comprise local and other views taken within the reach of an afternoon excursion. The selection at this meeting will be mounted in the Association album, and, when completed, will be presented to the Free Library of this town. The next meeting will be held on Thursday, 23rd inst., when the election of officers for the ensuing year will take place, and it is necessary that any person wishing to join should give notice at once to the Secretary, Jno. A. Hargreaves, High-bank, from whom further particulars may be obtained.

Fairfield Camera Club.—This Society held their Ordinary Meeting at their Club-rooms, Jubilee Drive, on Wednesday evening, the 7th inst., the Vice-President taking the chair.—A good number of members assembled to witness Mr. E. J. BROWN give a demonstration on *Zenochrome as an Aid to Zenotype in Producing Tones not hitherto Obtained by Zenotype alone*, the two toning solutions being Mr. Brown's own inventions. Mr. Brown proceeded to develop very rapidly nearly twenty prints, and produced some very beautiful shades, from rich brown to deep black, and showed to perfection the great possibilities of this toning solution, and answered clearly and concisely many questions put by members. Two of the members also developed prints successfully. A hearty vote of thanks, proposed by Mr. Forrest, seconded and carried, brought a most instructive evening to a close.

Leeds Camera Club.—The new abode of this Club is the Golden Fleece Café, 72, Boar-lane, Leeds, where meetings during the summer months will be held on the last Thurday in the month, May 30, June 27, July 25, and August 29, at eight p.m. A library has been formed in connexion with the Club. A number of books have already been presented, and the Secretaries, who have been appointed librarians, will be glad to receive gifts of books for the use of members. During the summer, excursions are to be held to places of photographic interest, one on Wednesday, and one on Saturday in each month, the first excursion being to Arthington and Poole by *char-à-banc*, on Saturday, May 25, leaving the City-square at two p.m. Members desirous of joining the excursion are requested to notify the Secretaries not later than Friday next. On June 3 (Whit Monday) an excursion has been arranged to the Lake district, and it is desirable that those intending to accompany this excursion will give early notice to that effect to the Secretaries, so that a saloon carriage may be engaged if sufficient notifications are received. A cycling section has been formed in connexion with the Camera Club, the first run being to Poole on Saturday, the 25th inst., leaving the City-square at two p.m. It has also been decided to provide distinctive badges for members at a small cost. Particulars can be obtained from the Secretaries, Messrs. H. F. Wigglesworth, 66, Wellington-street, or S. Barnes, Lady-lane.

Liverpool Amateur Photographic Association.—The fifth excursion of this Society was held on Saturday, May 11, the place selected instead of Lymm, which was found unsuitable, being Chester, where, under the leadership of Mr. James Parkinson, the greater part of the day was spent in photographing the many interesting details in the Cathedral, for which permission had kindly been granted by the Dean. The party numbered about twenty, and, after the day's work had been done, a substantial tea, served at the Bull and Stirrup, was greatly appreciated. Chester was left about half-past eight, Liverpool being reached an hour later, after a most successful day.

Dundee and East of Scotland Photographic Association.—A General Meeting of this Association was held in Lamb's Hotel, Dundee, on Thursday, May 2, Mr. Andrew Stewart (President) in the chair.—Ten new members were elected, and seven gentlemen were nominated for membership. The office-bearers for the year were elected as follows:—*President:* Mr. Andrew Stewart.—*Vice-Presidents:* Professor Steggall and Mr. W. Bertie.—*New members of Council:* Dr. J. K. Tulloch, Messrs. J. Thow, F. Sharp, A. Wilson, and J. Lawson.—*Hon. Secretary and Treasurer:* Mr. Vaness C. Baird. An interesting paper on *Lantern Slides from a Pictorial Point of*

View was read by Dr. TULLOCH [see page 309]. On the motion of the PRESIDENT, seconded by Professor STEGGAL, Dr. Tulloch was heartily thanked for his paper. It was intimated that Mr. P. Feathers had been successful in gaining the prize for marine studies.

FORTHCOMING EXHIBITION.

1895.		
June 29–July 6	.....	*Agricultural Hall. W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

LOSS OF INTENSITY DURING TONING AND FIXATION.

To the EDITOR.

SIR,—This happens sometimes much worse than it does at others. What does it depend on, and what are the circumstances that favour it, and the reverse? Is it the colour of the negative that makes the difference, or the quality of the light, or the image being more chloride of silver than organate? It is very troublesome, and, I think, prevails more than it did in the old albumen days. A very thorough washing seems to favour it, particularly with platinum toning.—I am, yours, &c.,

F. J. Q.

[The point raised by our correspondent is an interesting one, upon which we invite the experiences and opinions of our readers.—ED.]

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—The thanks of the photographic community are due to Mr. H. Wilkinson for his laudable efforts to reconstruct the affairs of the Photographers' Benevolent Association. I had intended to be present at the meeting proposed by that gentleman, but, for fear of what might happen to me on the way thither (in these troublesome times), I content myself for the present with hereby wishing him every success, and expressing my regret that so far assistants have held aloof.

I have heard it stated that the executive of the Society have lately threatened to hand over the funds of the Association to a kindred Society if things do not show an improvement soon. The grave responsibility of such a step is so obvious, that I trust that nothing definite will be decided by the Committee without giving the photographic profession, as represented by the National Union of Professional Photographers, a voice in the matter.

Without wishing to reopen the question of the treatment I received when the Society was rescued from its lethargy a few years ago, I say emphatically, if this course is pursued with others, it cannot but be detrimental to the cause.

My successful agitation to obtain an Hon. Secretary was evidently the cause of raising the disbursements from the absurd sum of 4*l.* to more than 100*l.* per annum. If this could happen, it matters little whether it was due to the excitement occasioned by this agitation or its merits. Why should not the experiment I so strongly advocated be tried also, viz., to send the Association on its way re-labelled, "This establishment is under entirely new management?" which would be an effectual test whether there is a want of confidence in the administration or otherwise.

New brooms sweep clean, and, as the old one is perhaps somewhat the worse for wear, let at least a new brush be affixed to the old handle rather than throw away stump and all.

Whether the altered state of the profession at the present time has anything to do with the apathy displayed is a debatable question. I am inclined to think that the middle-class photographer is practically extinct, and that only the high-class practitioner and the cheap man will survive.

The first-class assistant rarely requires help, if ever, whilst the other is generally recruited from all classes, being often drafted from various other trades, and perhaps this has something to do with the decline, or can it be that large manufacturers' interests are now divided amongst numerous smaller competitors, greater in proportion than the increased demand would warrant, and, their profits being smaller, they probably cannot afford to give substantial sums? However, I feel sure that, if appealed to, the National Union of Professional Photographers would not refuse to take the matter in hand and sift it; but, no doubt, the opinions which may be expressed in your old-established and well-known JOURNAL will prove of the utmost value in coming to a wise decision, which is the fervent wish of yours, &c.,

J. HUBERT.

382, *Mare-street, Hackney.*

To the EDITOR.

SIR,—As a former member of the "Photographers' Benevolent," I would beg to suggest that the same should be remodelled and started as the "Photographic Benefit Society" with a weekly subscription, to be hereafter fixed, and not make it, as some think it to be at present, a purely charitable institution with such a nominal subscription. Together with other photographic assistants in a large firm, I myself would be happy as far as in me lies to use my best endeavours to make the reconstituted society a success by endeavouring to secure members for the newly formed society.—I am, yours, &c.,

RICHMOND.

A FADED VISION.

To the EDITOR.

SIR,—Genius: pure—simple, undiluted genius—is bound to triumph over mean and commonplace obstacles. It will assert itself and lead onward; upward through the mists of ignorance on to the plains of knowledge, and under the waving palms of victory.

He was an amateur. I knew him. He bought, two weeks ago, a guinea set of apparatus, second-hand, for ten shillings, and the other morning, as soon as I opened my reception-room door, he came in with a shout like that of a conquering gladiator.

"I've found it," he cried, his face ablaze with that electric glow that betokens your true son of genius.

"I didn't know you had lost it," I said; "I've only just got up."

"Yes," he went on excitedly, taking no notice of me; "the rosy-cheeked Goddess of success has smiled bountifully upon my efforts. The broad, gold-paved highway to fame has been opened to me; the towering gates that shut out the herd of mankind have been opened by my keys, and those keys have been my early experiments."

"Keys, my friend," I remarked; "I don't understand; and rosy-cheeked, a what-a smiled, you say?"

"Yes, smiled," he replied, "and led my mind captive by the exciting fetters of enthusiasm into the expansive realms of laborious research. I have discovered," he yelled, "what men of science have hoped and prayed for, and gone without discovering, with hoary heads and tottering footsteps, to the land of great shadows. I have found that," he continued, "which chemists have searched in vain for, that for which they have spent gold lavishly, and have grown lean and hungry-looking in search of. Rejoice with me, for I will yet have my name emblazoned in platinum characters upon the scroll of fame, and have it sent down the brooklet of posterity as the name of an unparalleled inventor. I have it here"—and then I noticed he held a paper in his hand—"I have it here—the initial stage of that that shall show to the world nature mirrored in all her loveliness: photography in colours," he screamed. "Wonder of wonders, and yet so simple. Chips of Cæsar! and to think that I, a mere beginner, should be so favoured," and he laid the paper (which opened) on the table, and struck an attitude half brother to the pose of a Grecian sculpture, and then fell exhausted into a chair.

I looked to see what was in the paper. It was a green-fogged negative, quarter-plate size, with patches of red and yellow streaks all over, caused by under-exposure, forcing, and pyro staining, and appeared to be a Sunday morning back-yard, with a few extraneous affairs thrown in.

I broke the news to him as gently as I could without going too much into details, and sent the boy for a cab. We led him unresistingly to it, and placed the object of his visit fondly on the seat in front of him; his eyes roamed wildly round until they lit upon it, then, with a whoop of fury, that would have made the fortune of a red-skin warrior, he seized it and dashed it on the pavement.

An hour later, I saw smoke hanging about round the vicinity of his back garden, and happening to stroll by in the afternoon, I saw a lump of wood ashes, and among them something that looked as if it had once been cheap camera fittings.—I am, yours, &c., W. EDMOND WALLIS.

Sevenoaks, May 4, 1895.

A HARD CASE.

To the EDITOR.

SIR,—As the outcome of the recent correspondence *re* the above, you have kindly given us through your columns Mr. J. A. Randall's ideas as to a proposed guild of photography, with which I am very pleased, and I think we are indebted to him for the trouble he has taken. But I am sorry he had so few replies to his appeal. I think, after what you have published, there is room for action, and as assistants we seem to be a long way behindhand in the matter of protection. Nearly all other trades and professions have some kind of guild or society, but among photographic assistants there is none. This is not as it should be, as we have large interests at stake, and many grievances to redress, and a guild as proposed by Mr. Randall would to a large degree meet these. I hope, after having seen the details of the guild proposed, there will be a large response to Mr. Randall's appeal, when it would be easy to float such a scheme.—I am, yours, &c.

A YOUNG ASSISTANT.

A LUCRATIVE APPOINTMENT.

To the EDITOR.

SIR,—I have to thank Mr. Stuart Lancaster for the information contained in his letter, and to apologise for my "gross impertinence"; had I known he was *Art Photographer to the Queen* I might have hesitated before taking the liberty of drawing attention to his advertisement—he must not consider I have any personal ill-feeling towards him, however, as I have not, nor do I aspire to have, the honour of his acquaintance. It was the advertisement that attracted my attention, not the advertiser; and my excuse (if any be needed) for writing you is this:—

For a long time I have been wondering what prospect there was for the hundreds of assistants that are being annually turned out by our Polytechnics and similar schools, to say nothing of the large number of amateurs who are constantly adding themselves to our professional ranks. My curiosity is now satisfied. They may, when they have become good operators, retouchers, and printers, do not mind working seven days a week, and have references of from twelve to seventeen years, find themselves applying (with thirty others) for employment in an establishment patronised by Royalty, at the munificent salary of 12*s.* per week *with board and lodging*.—I am, yours, &c., DROP SHUTTER.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

ALFRED WATKINS.—Received. In our next.

A. J. W.—1. A mixture of paraffin wax and beeswax. 2. Practically speaking, No.

G. E. B. (Swindon).—Thanks for the enclosure. You may take it that the value placed by professional photographers on such certificates is *nil*.

F. H.—Doubtless the reason given explains the success. Have you tried a substratum of gelatine, treated with chrome alum? This might answer.

H. BLACKBURN.—The fault is that the lighting is too hard. Can you not so arrange as to subdue it somewhat? this will give the effect sought for. The work is fairly good.

CAM says: "Where can I get some calico at least eight or nine feet in width for backgrounds?"—In reply: Try Avery & Co., Great Portland-street, W., or Sharp & Hitchmough, Dale-street, Liverpool.

STUDIO says: "Will you kindly tell me the address of a builder who makes studios (portable), to put up with nut and bolt, in sections?"—Perhaps some correspondent can supply the desired information.

C. G. & CO. ask: "We are anxious to know whether we can send for exhibition (and competition) pictures from our negatives printed by one of the wholesale firms, 24×18 carbons, for instance."—In reply: Certainly.

FLORAL.—Yes, there should be a distinct advantage gained by using colour-sensitive plates in photographing flowers. They should be used with colour screens, the particular tint of which should be dependent upon the prevailing colours of the flowers to be photographed.

F. LLOYD.—The only fault we can find with your picture is that the tree in the centre is not correctly posed. It ought to have been placed at the left margin, or nearly so. If the little village must be *en evidence*, better to shift the point of view from where it now is to the other side of the tree referred to.

AN OLD SUBSCRIBER says: "I am writing to know if you would tell me in your correspondence column whether an agreement binding on both sides for two years is good, being only witnessed and not stamped. I am anxious to leave, as I wish to better myself, and I only signed because I could not get anything else at the time."—In reply: The agreement is not binding unless it is stamped.

S. MATHEWS.—Permission is required to photograph in Kew Gardens, therefore, without that, you will not be allowed to use even the hand camera. Disguising it or hiding it in a hand bag will be of little avail we imagine, for, if we mistake not, all bags and parcels have to be left at the lodges. But why go to that trouble when permission can be obtained by simply applying for it in writing?

ALPHA.—You will find a case quoted on another page in which Mr. Gambier Bolton, recovered a penalty and damages amounting to fifty pounds together, for an infringement of one of his copyright photographs by a sketch. Your case, as related, appears to be analogous to that, and therefore there seems no reason why you should not also recover substantial damages—that is, supposing your title to the copyright is good.

H. O. THOMPSON says: "Can you inform me if the gold in combined bath can be thrown down by ferrous sulphate if the combined bath be mixed with ordinary acetate bath, or does the hypo in the combined bath prevent the gold from being thrown down? If the latter is the case, what should I do with old combined bath to extract the remaining gold?"—Yes; ferrous sulphate will act as a precipitant of the gold from the combined bath as described.

VIEW says: "Can you tell me the name and address of any firm who mount up views as opalines and on plush blocks, &c., the same as you get at the seaside? I have some recollection of a firm who advertised in your JOURNAL to do this work, but I cannot now find it. I believe a great many photographers would send their own photographs to be mounted up in this way?"—We cannot remember the address of such a firm, which, however, some of our readers may be able to supply.

F. MORRISON.—From the description, there is no doubt that the lens is one of the old triplet form, and it is quite correct that the largest component of it should be nearest the ground glass. This is a very good form of lens for copying purposes (the principal use to which it is now put), and by some houses that make this branch of photography a speciality it is still preferred to all others. It is a mistake to think this instrument is an obsolete one, as it still has a place in the catalogue of one of the leading London opticians. As the lens bears no name, its value will depend upon its quality alone.

REV. A. J. T.—The new way of silvering glass to which you allude consists in precipitating the silver from, say, 100 parts of a 10 per cent. solution of the nitrate by means of ammonia, adding a bare sufficiency to redissolve the precipitate. Now make up the volume of the solution to ten times the amount by adding distilled water. To deposit the silver, dilute a 40 per cent. solution of formaldehyde to a 1 per cent. solution, and mix two parts of the silver solution with one part of the diluted formaldehyde immediately before applying it to the glass to be silvered. The silver is deposited in from five to ten minutes, according to temperature.

T. A. S. writes: "I have just entered a new service. The other day I was sent about twenty miles away from this town to take some views of a church, and the work took the whole of the day. As the church was nearly four miles from the railway station, I engaged a strong lad to help me carry the apparatus—a 12×10 camera, three dark slides, &c.—giving him 1*s.* for the job and some refreshment. I also had some refreshment at my usual dinner time, the total amount thus expended being 3*s.* 2*d.* My employer refuses to recoup me this amount, saying that I ought to have carried the apparatus by myself, and that I should have had to have dinner had I been at home. Is there any rule in the trade applying to such a case as this?"—We do not know of any set rule in the matter, but we believe it is the employers' custom, as it ought to be, to pay all reasonable expenses incurred by an operator when sent away from home.

LLOYD'S HALF-TONE ENAMEL PROCESS FOR COPPER.—Mr. H. J. Lloyd, Wyalusing, Pa., whose excellent half-tone productions are frequently seen in our pages, contributes the following process, which he believes to be unlike any of the published formulæ, and, so far as his knowledge goes, has not been used by any other engraver. It is as follows:—

No. 1.

Le Page's glue	3 ounces.
Albumen	1 ounce.
Water	4 ounces.
Bichromate of ammonium	80 grains.

No. 2.

Gum acacia	½ ounce.
Water	8 ounces.
Aqua ammonia	2 drachms.

Mix, use three parts of No. 1 with one part of No. 2.—*Wilson's Photographic Magazine.*

CONTENTS.

	Page
THE PHOTOGRAPHIC EXHIBITION AT THE IMPERIAL INSTITUTE	305
PRINTING PAPERS WITH GLOSSY SURFACES	305
RECENT EXPERIENCES IN SPOTS	306
ON THINGS IN GENERAL. By FREE LANCE	308
LANTERN SLIDES PICTORIALLY CONSIDERED. By J. K. TULLOCH, M.B.	309
"A. P." JOTTINGS. By LESLIE SELBY	311
IMPORTANT COPYRIGHT DECISION	312
BIRMINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION	313
THE FRENA FILM-HOLDER	314
OUR EDITORIAL TABLE	315
NEWS AND NOTES	315
RECENT PATENTS	316
EXCHANGE COLUMN	316
MEETINGS OF SOCIETIES	316
FORTHCOMING EXHIBITION	319
CORRESPONDENCE	19
ANSWERS TO CORRESPONDENTS	320

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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EXTEMPORISED DRY-PLATE MAKING.

We have not unfrequently been told that it would prove a great boon to many photographers if the dry-plate manufacturers would supply emulsion in either a dried or a gelatinified condition, so as to permit them to coat their own plates occasionally, when from any cause their supply of any odd or special size ran out. Dry plates can now be procured of such excellent quality and at such low prices, that although scarcely any one would now think of making them for himself for use in the regular course of his business—and this whether he is a professional or an amateur—yet the ability to coat a few plates of a size not always readily procurable must prove valuable to many who are at a distance from centres of supply.

There are two methods of treating gelatine emulsion so that it will be in a condition of readiness for applying to a clean glass plate. One of these consists in adding to the liquefied emulsion an antiseptic which will check or prevent decomposition without destroying the sensitiveness. Of these there are several, but it is not easy to determine which possesses the balance of advantages. The presence of a little creosote in a solution of gelatine will prevent decomposition for a protracted period, but it has been found to impair the sensitiveness to some extent.

On one occasion we received a bottle of gelatine emulsion, which was liquefied by heat and applied to the coating of plates. These plates kept good for many months until the last one was used, but what remained of the emulsion left in the bottle underwent putrefactive decomposition in three or four days. Just about the same time a similar bottle was received from a Scotch photographer, who appeared to have foreseen this possibility, for, when it was taken into the dark room and liquefied for the purpose of coating, it was found to smell somewhat strongly of menthol, or one of the family of the mints. This remained quite good for at least a month, or until every drop had been used. The peppermint here had proved itself to be an antiseptic.

The late Colonel Stuart Wortley once gave us some plates which he had coated with emulsion he had prepared about six weeks previously, the antiseptic in which was thymol, which we understood to have been made by digesting ordinary garden thyme with alcohol. He gave it as his opinion that he could coat plates with it after another month, which would be quite good.

It was Mr. Richard Kennett who grasped the real principle of making an emulsion which should keep good for years if necessary. He seemed to have realised that, in order to make it keep for an indefinite period, it should be entirely desiccated; and, after a time devoted to experimenting, he in 1873 obtained a patent for the result of his ingenuity. He was intimately conversant with the possibilities of gelatine emulsion, and at that time did not foresee the manufacturing businesses that were ultimately to arise out of the dethronement of collodion by gelatine, for, in those days, each photographer made his own plates. His aim was to put it in the power of the photographer to make his plates with a minimum of trouble. Every one then was believed to be able to make gelatine emulsion, fast or slow, as suited his requirements. What was wanted was an emulsion, which, when made and found to be good, could be used according to the requirement of the user. The emulsion, having been made and tested, was, by Kennett's patent, thoroughly dried, cut up into small strips or filaments, which were weighed out and packed into light-tight packets, each requiring the addition of so much water to render it in a condition for being used, and which quantity was printed on the outside of the packet. To give some idea of the method of using this, we may state that, two or three years after receiving a small packet of desiccated emulsion from Mr. Kennett, we saw from the label that it was for two ounces of water. This we added, and allowed it to stand until the pellicle had absorbed it, after which it was liquefied by immersing the bottle containing it in warm water. A dozen of plates, previously cleaned, were then coated and dried. These ultimately, when exposed and developed, gave negatives with which no fault could be found, either as regards sensitiveness or quality of image. So far as could be seen, there was no reason why, if carefully put up, this desiccated pellicle might not have been kept for a much longer period.

Now, what we appeal for to our emulsion-making friends is that they should afford to dilettanti photographers the means by which they might coat an occasional plate, each for himself when occasion, or even whim, so desired it. If it were known that on certain dates emulsion in small quantities would be sent out at not unreasonable prices, it is probable many would avail themselves of the opportunity of making purchases of it, even if they should never use it. It might either be placed on the market in the jellified form, or be desiccated in the form of thick pellicles which the user could cut up and liquefy for himself.

There is no insuperable difficulty now, any more than in an earlier period, of each making his own emulsion by any of the

innumerable formulæ which were at one time so plentifully distributed throughout the journals; but, as photographic human nature is constituted at present, one would much rather pay even a good price for any commodity of this nature, made by a competent manufacturer, than put himself to the trouble of doing so himself.

Collodion emulsion occupies a totally different place from gelatine. It keeps for an indefinite time after being made, and is always in a fluid for; moreover, it dries immediately that the plate is coated; but for negative work, dried collodion lacks the sensitiveness of dried gelatine, and is much more delicate to handle, although we quite grant that exquisite pictures may be made by its agency.

If we understand photographers aright, some of them are quite willing to pay a proportionately higher price to those who will enable them to prepare an occasional plate for themselves, and on their behalf we make this appeal.

PHOTOGRAPHIC MOUNTANTS.

The subject of mountants is, and always has been, an interesting one to the photographic world. At the last meeting of the Photographic Section of the Croydon Microscopical and Natural History Club there was an interesting discussion on starch as a mountant, and, as that material is the one that is used by probably nine out of every ten photographers, what was said about it is of interest to all who employ it (see report in our last issue). Mr. J. H. Baldock, F.C.S., described the different sources of commercial starch, and said that, although starch from rice has been generally recommended as a photographic mountant, in his experience there is very little to choose between it and that from other sources. An objection that has been made by some against starch paste is that it will not keep, and that it is a trouble to make fresh every time prints have to be mounted. Hence many amateurs, who do not like trouble, have employed one or other of the pastes sold by stationers and others for adhesive purposes generally, and which sometimes contain, as antiseptics, matters highly injurious to photographs — often bichloride of mercury, for example—with the result that the prints quickly fade, and, not infrequently, the mounts are condemned as being the cause.

The usual way of making starch paste is to mix the starch with a small quantity of cold water, and then add boiling water until it thickens and becomes transparent in appearance. Mr. Baldock recommends the starch to be boiled for a few minutes, as then a clearer paste is obtained and greater keeping properties conferred upon it. To those who *do* object to the slight trouble of making fresh starch every time it is wanted, he advises boiling the paste well to begin with, and then adding an antiseptic, such as boric or salicylic acid, oil of cloves, &c., for, when thus treated, it will keep, in well-corked bottles, for a long period. Another gentleman who took part in the discussion—Mr. Gower—also recommended the paste to be boiled. He gave the following formula: One ounce of the best white starch is mixed in ten ounces of water. It is then to be boiled for some minutes, and half an ounce of glycerine is added, also two or three drops of oil of cloves. When the paste is nearly cold, half an ounce of methylated spirit is added, and well mixed in.

We are often asked for a method of making starch paste that can be kept ready for use as required. Those who object to the small amount of trouble involved in making a little fresh starch at the time of using should give the above methods a trial. It may be mentioned that the opinion, generally expressed at the meeting referred to was that, if pure starch be used, is freshly prepared, and with a preservative added, it left nothing to be desired as a mounting material for photographs.

Although starch is almost the universal mountant in this country it still remains a question as to whether it is the best, or even the most convenient in use? Gum arabic is a very convenient mountant, but it has been very generally condemned, and the same may be said with respect to other gums. Yet some of the oldest photographs we have in our possession, now in good condition, between thirty and forty years old, were mounted with a plain solution of gum arabic. At one time this material was much used for mounting, often even in a very decomposed condition, and its being used in that state, no doubt, largely accounts for the ill repute in which gum now stands. Dextrine also is a very convenient mountant; but, this material, as met with commercially, is almost invariably acid, and should therefore be avoided for mounting photographs with.

The mountant we are much in favour of, as regards stability of the prints, is gelatine, and for this reason: starch, and similar materials, as it were, amalgamate the prints with the mounts, while the film of gelatine seems to act somewhat as an insulator between the print and the mount. Hence, if the latter contains injurious matter, the print is the better protected from its influence. Another advantage with gelatine is that with it prints can be mounted in albums, or on plate paper, with far less cockling, if any at all, than with starch. Further, a solution of gelatine is easily prepared, and, when once prepared, will keep good for months. The only trouble attending its employment, after preparation, is that the vessel containing it must be placed in warm water for a few minutes before the adhesive is used.

The difficulty some have met with in using gelatine has arisen from choosing one of an unsuitable character for the purpose. The most suitable gelatine is a pure one of low quality—that is, a low quality from a gelatine-maker's point of view—such as those sold as soup gelatines by Nelson, Cox, and other British manufacturers for culinary purposes. Foreign gelatines should be avoided, as they are, as a rule, always more or less strongly acid. They have also rapid setting properties, which render them difficult to use for our present purpose. The gelatine, after being "swelled" in cold water, should be dissolved by heat. Definite proportion of water to gelatine cannot be given, as the gelatines of different makers vary as to the quantity of water they will require. As a rough guide, however, if the solution when cold forms a stiff, firm jelly, it will be of about the right strength for the work. While the solution is still warm and fluid, some methylated spirit is added, and, if desired, an antiseptic, such as a few drops of oil of cloves. The more spirit and the less water that is used in forming the mountant, the less will be the cockling of the mounts. Alcohol is an excellent antiseptic in gelatine. We have kept a solution of gelatine containing methylated spirit, with no other preservative, for several years without decomposition.

Glycerine has sometimes been recommended as an addition to gelatine and starch as mountants, but we consider its presence is not to be recommended, notwithstanding that it is, in a sense, a preservative of gelatine, owing to its hygroscopic properties.

FINISHING GELATINE PRINTS.

THE greatest drawback to the general adoption of gelatino-chloride papers by workers on a large scale is undoubtedly the difficulty of handling considerable numbers of prints, and passing them successfully through the various operations from toning to mounting. This difficulty arises from the softer and more delicate nature of the gelatine surface as compared with albumen, the latter being, as is well known, coagulated or rendered insoluble by the process of sensitising, in which condition it is but little liable to injury by friction or abrasion, and possesses practically no tendency to adhesiveness. On the other hand, the gelatine film retains its original solubility in water above a certain temperature, and, in the moist state, is not only sadly liable to injury from the slightest rough usage, but also exhibits a strong tendency to adhere to anything with which it may come in contact.

For these reasons, although it may be a matter of comparative ease to manipulate a few gelatine prints at a time, the difference when large numbers are in question becomes very marked, and will be more especially appreciated by those who have been accustomed to working the albumen process. The necessity for extra care becomes apparent in the first stage of washing previous to toning, and continues until the prints are mounted and dry.

With albumen prints, large numbers may be introduced into any of the automatic or mechanical washers, in which they are kept in constant and more or less vigorous motion by sprays or currents of water, or other means, without any danger to the comparatively tough surface; but, if the same methods be applied to gelatine papers, there is every danger that the whole batch will be spoilt, more particularly if ordinary water, carrying with it minute particles of solid matter, be employed, in which case the dust or grit will inevitably leave indelible traces of its action upon the sensitive surface. At this stage we fear there is no remedy, or no other way out of the difficulty, than the exercise of care and the adoption of the system of handling each print singly, instead of treating the whole mass together. But, after all, the trouble of passing the prints singly from one tank or receptacle to another, if the plan be methodically followed, is not much greater than that involved in attending to an automatic washer, and there can at least be no doubt as to the thoroughness of the washing in that case, whereas with machine washing there is, and can be, no guarantee that the prints do not stick together during the process.

In handling the prints, whether during washing, toning, or fixing, they should always be placed face downwards, and only turned over as required for examination. In this way there is not only less chance of particles of dust, or solid matter, settling on the adhesive surface, but there is less danger of mechanical injury from the thumb or finger nails in picking up the prints. One great point to be observed is that, whether the prints be in the washing tank or in the toning or fixing bath, they should not be crowded. It is an easy matter to have the first of sufficient capacity to accommodate any number of prints without undue crowding; but, in the case of the others, more especially the toning bath, motives of economy, as well as convenience, render it desirable to keep the volume of solution within certain bounds, and here the necessity arises for limiting the number of prints to the volume of solution and the dimensions of the bath. If this plan be followed, it has the additional advantage, beyond lessening the liability to mechanical injury, of promoting uniformity of action and perfection of result.

After the prints have passed the fixing stage, and have been sufficiently washed, it is in our opinion always well worth the trouble to resort to the use of the alum bath, if this has not been previously used, as is the practice with many workers. Besides hardening the surface of the prints, it deprives them of much of their objectionable adhesiveness, and renders them far easier to manipulate during the after-processes of mounting But care must always be taken to remove all traces of alum before proceeding to mount.

It is not a very general practice, we believe, to dry gelatino-chloride prints previous to mounting, though this, especially after aluming, tends still further to harden the gelatine and rob it of its adhesiveness, and we know more than one worker on a large scale who goes to the extra trouble for this very reason. Where this is not done, the usual practice is to blot off the superfluous moisture between sheets of blotting-paper, previous to laying down the prints on some other clean surface in order to apply the mountant, and here the troubles from adhesiveness commence in earnest. Nine out of ten samples of ordinary blotting-paper are utterly unsuited for use with gelatino-chloride paper, on account of the quantity of "fluff" they give off, and which adheres tenaciously to the surface. The bibulous "boards," specially made for drying prints, are better; but best of all, and, moreover, beyond suspicion from a chemical point of view, is ordinary filtering paper. If a sheet of this be placed in contact with the prints, and backed up with ordinary blotting-paper or drying board, there will be little danger of either "fluff" or chemical action; but under no circumstances should the prints be left long in contact with the drying surfaces.

Next we come to the surface upon which the print is laid face down for the purpose of "starching," and this presents another difficulty, some kinds of paper exhibiting an obstinate tendency to adhere so firmly to the partly dried surface that it is impossible to separate them without tearing. Sized papers are the worst in this respect, and, after trying all kinds of surfaces of a textile nature, waterproof, waxed, and otherwise, we have come to the conclusion that nothing excels filtering paper already mentioned.

But the following departure from the ordinary course saves one or two operations, and obviates much of the difficulty alluded to:—Prepare a sheet of plate glass—or, at least, glass with a fairly flat surface—by polishing it with powdered talc or with the waxing solution employed in carbon printing, and on this surface lay the print face downwards as it comes from the final washing water, without previous blotting off. Remove the superfluous moisture from the back either with blotting-paper or the squeegee, and proceed at once to apply the starch or other mountant. All the trouble arising from "fluff" is obviated, and the layer of water between the two surfaces causes the starched print to strip from the glass with the greatest ease and smoothness, and with a far superior surface to that with which it leaves any kind of paper. On the hard surface of the glass, too, the mountant is more easily spread, and any particles of dust more readily detected, while, with a little care, a very large number of prints—of the same dimensions, of course—can be starched without once cleaning the glass.

Finally, in rubbing down the print when placed on its mount, nothing equals fine bibulous paper. In this case we prefer the finest-grained Swedish or English filter paper, as

being alike free from "fluff," and fine in texture. Although more expensive in first cost, it is not really so in the long run, as, if carefully used, it will last a long time. One word as to rubbing down the prints: Many operators we have seen at work apply an immense amount of friction and "elbow grease" to remove every crease and inequality. This is not only unnecessary, but it actually causes much of the trouble that arises. If the print be carefully laid down, one sweep of a roller, or other squeegee, or, better still, of a soft towel folded into a firm pad, will do all that is necessary, a sheet of bibulous paper being, of course, interposed. When the print is in contact with the mount, any inequalities arising from the mountant intervening may safely be left to disappear in drying.

So far as the burnishing or after-treatment of gelatine prints is concerned, if they are properly dried, not the least trouble need be experienced.

The Best Lunar Photographs yet Executed.—According to the *Report Annuel* of the Paris Observatory, it states of the prints of the moon obtained by the large equatorial Condé, these prints, of which we now possess a sufficiently numerous collection, are the largest we have yet had (·18 mm.), thanks to the long focus of the instrument. Some of them appear to be the most beautiful and most detailed hitherto obtained, according to the evidence of French and foreign astronomers.

Methylated Spirit.—Surely there is something yet to be learnt about this useful liquid. We have pointed out how little difficult it is to obtain the older kind, which is not so very offensive in smell, but we read that quite recently a man was brought up at the Mansion House for selling a perfume called "Lavender Blossom," which contained methylated spirit, and its derivatives, contrary to the statute in that case made and provided. To the ordinary reader it would certainly appear that any methylated spirit used in a perfume—even a cheap one—must be something very different from that employed by and sold to photographers.

A Cheap Magnesium Torch.—"G. M. H.," in the *Scientific American*, describes a simple and cheap mode of making a continuous flashlight or electric torch. His reservoir is a small vial. Its cork is fitted with two tubes, one reaching to the bottom of the fluid to receive air blown in through the lamp or from a pair of bellows, while the other, starting from near to top, carries out the jet of magnesium powder blown out through the first. Into the cork is let a ring of wire, rolled round with cotton-wool or tow, placed at the top of a wire rod attached to cork. The tow or wool is saturated with methylated spirit and ignited, and the jet of magnesium powder is conveyed by the exit cylinder just through the ring of fire, and thus continuously ignited. This makes a useful and effective piece of apparatus.

Slide-making by Reduction.—A writer in the *English Mechanic* (Mr. A. P. Wire) gives some useful hints about artificial illumination in producing lantern slides by reduction. He recommends two albo-carbon gas burners as giving the best kind of light to be reflected from a white surface. This he makes by straining, in the usual way, a piece of white drawing-paper on a drawing board, and giving it two coats of Chinese white. With *f*-11 he finds, using a hydroquinone developer, that about three minutes is the average time required to obtain thoroughly good slides on bromide plates. It has been stated that the incandescent gaslight is less rich in actinic rays than a visual inspection of its light would lead one to suppose, but we cannot but think that, used in the above manner, it would be found to require a still shorter exposure than that required by albo-carbon.

Photography of the Highest Waves of the Spectrum.—Under this heading appears in a recent issue of *The Chemical News* an extract from a letter to its editor by Dr. Schumann. He has at the commencement of this month, for the first time, photographed the spectrum of air far beyond the wave-length 180·0 (Angström's scale), and has found that air, notwithstanding its intransmissiveness for the shorter wave-lengths, develops an astonishing energy. For instance, one of these photographs of the air, in a length of 34 mm., shows more than fifty bands all shading off towards the red. "I have," he says, "resolved many of these bands into lines. My present photographs of the hydrogen spectrum have shown a greater wealth of lines than might have been expected from my former estimate (600 lines)." In the district beyond wave-length 180·0 (Angström's scale), he estimates the total number of lines at between 1500 and 2000.

The Electric Light and Watches.—Many a photographer who has fitted up an electric-light installation, with dynamo complete, has found to his sorrow that something has gone wrong with the works of his watch. The steel portions have, in fact, become magnetised through having been brought within the influence of the dynamo. This liability to injure the correctness of pocket time-keepers has led, it is true, to the production of watches in which steel springs, &c., are replaced by non-magnetisable metal; but it is not every one who would willingly part with a watch that had hitherto done good work; hence a ready means of demagnetising a watch may be found useful. A writer to the *Echo des Mines*, pointing out this danger of magnetisation, which always slows a watch, and sometimes causes it entirely to stop, describes his plan as follows:—A natural magnet, or a powerful electro-magnet, must be placed in horizontal position on a table, for instance, and the watch held horizontally about half a yard off, on a level with the magnet. The watch must then be brought slowly nearer the magnet, while being turned slowly, and, at the same time, as regularly as possible, between the fingers, as on a vertical axis. When the poles of the magnet are reached, the turning of the watch is to be continued, while being gradually withdrawn till the starting point is reached.

JOTTINGS.

I AM informed that the Royal Photographic Society will, at the end of the present quarter, remove from the premises it now occupies at 50, Great Russell-street, to No. 12, Hanover-square. Not the least of the advantages to be gained by the removal will be that, as the rooms are on the ground floor, there will be no more of that awful four-story stair climbing, which for years has been the dismay and the horror of the fat and scant of breath. For the rest I am assured that the rooms will be very convenient. The membership roll of the Society is steadily advancing towards its first thousand, and the Royal Photographic Society may now, I suppose, be safely termed the largest Photographic Society in the world. The Camera Club possibly outdoes the Society in point of numbers, but then there are those who deny the Club the right to call itself a "photographic" institution.

That flourishing photographic body, the Photographic Society of Philadelphia, has, it appears, been passing through troublous times. It has been confronted by, if not the case of the Eternal Feminine again, at any rate the case of the Eternal Feminine's Bonnet, which those of my readers who know anything of the sex will appreciate as of hardly less importance than the fair wearer herself. From the last number of the Philadelphia Society's *Journal* I make the following extract:—

"The Secretary read the following communication, which he had received from Mrs. Charles Schäffer:—'Having put the question of bonnets before our four women members, and receiving a most emphatic reply from each one, I write you this note, expressing our feeling with regard to it. We each and all feel that bonnets have no place in the photographic room, particularly in one constructed as ours is. On admitting us you have kindly placed at our disposal a

room, which we unanimously think could not be put to a better use than a place for wraps. Private requests that bonnets should be removed have always proved a failure, and asking you to adopt some positive plan for their removal is a greater request than it at first looks. But we do earnestly ask you to place this subject before the meeting in such a way that the Photographic Society of Philadelphia may go down in history as the first body to abolish the great nuisance of bonnets at public entertainments.' The reading of this letter was followed by hearty applause, and, upon the motion of Dr. Mitchell, seconded by Mr. Carbutt, the Secretary was instructed to announce in the next bulletin that the Society had set apart a room especially for ladies' wraps, and that it was the request of the Society that bonnets should be removed during lantern exhibitions and other entertainments at the room of the Society."

And so the great Bonnet Question ended to the satisfaction of all concerned. But I must confess that the cause of this pretty little teacup tempest is not at all clear to me. On what grounds were the bonnets objected to? Was it because of their size? If so, the Philadelphia dames have a more spacious taste in head gear than their British sisters. Or should we for "bonnets" read "hats?" If so, how easy it is for us to sympathise with the Philadelphia photographers in their objection to the wearing in an entertainment room of such mammoth abominations as our lady friends at home are in the habit of taking shelter under! Yet, there are only four lady members of the Philadelphia Society! Surely, then, the presence of so few bonnets at a lantern entertainment could not, if the ladies were properly placed, interfere with the comfort of the gentlemen? But everything, I suppose, would depend on the size of the bonnets (or hats).

The almost insane dislike which the French military and legal authorities evince towards the employment of a camera near fortified places gives some point to the following incident, in which a hand-camera user bore a prominent part. This gentleman, it appears, snap-shotted, at a railway station, a man in custody on a charge of murder. The amateur was arrested, and was only set at liberty conditionally upon forfeiting the exposed plate. But the confiscatory powers of the procureur of the République formed the subject of legal consultation, and it appeared that there was nothing in the Penal Code to warrant the summary action of that functionary. Photographers, therefore, have a perfect right to take photographs of prisoners in custody in public places, without fear of official interdiction, and are only liable to get into trouble if they put the photographs to such uses as are likely to injure the individuals photographed. The procureur raised objection to the photographing of the alleged assassin on the ground that the course of justice would very likely be interfered with. A curious plea, certainly.

Mons. E. Forrestier, in the last number of the *Bulletin* of the Association Belge hints that Messrs. Lumière have abandoned experimental work with Lippmann's process of colour photography in favour of a modification of the processes of Cros and Ducos du Hauron. If this should prove to be the case, it would, I take it, be tantamount to an admission that the Lippmann method is not yet of practical use. However, we shall see. Messrs. Lumière recently presented a note to the Paris *Académie des Sciences* descriptive of the latest method they employ. This, briefly outlined, consists of taking, by means of colour filters, three negatives for the red, blue, and yellow, printing by superposition on a sensitive surface of bichromated gelatino-bromide, and plunging the *cliché* after each impression into a solution of aniline dyes corresponding in colour to the "colour" of the negative. The method, of which I have only given the crudest outline, reads very like a three-colour ink-printing process in theory.

There must be many of my readers who have spare or duplicate prints from their negatives, which, in default of not knowing what to do with, they allow to accumulate in books and portfolios, and in odd or out-of-the-way corners of the house, to nobody's profit or edification. It has occurred to me that the numerous workhouses, hospitals, homes, and charitable institutions in our midst would welcome photographs, as well as other kinds of pictures, as likely to impart pleasure to the inmates, and I give the hint in the hope that it may be availed of where and when opportunity offers. I may mention that I am instigated to refer to the matter by reading in a daily newspaper that the guardians of the Wandsworth and Clapham Union are appealing for newspaper pictures, coloured and plain, wherewith to decorate the interior of the local "House." I presume photographs would not be objected to. By the way, in order that the lives of the poor people who have come down to the "Union," as it is sometimes called, may not be rendered irredeemably miserable and melancholy, I hope the New School of Photographers will kindly refrain from presenting any of *their* photographs—or "things."

Is amateur photography on the decline? I put the question because lately when, conversing on the subject with several friends who are in a position to form a judgment upon it, they have appeared to think that the answer should be in the affirmative. I myself thought otherwise. There are more photographic societies, there are more dealers than ever there were, I urged; but I was met by the rejoinder that photographers who are members of photographic societies are obviously but a fraction of the photographic community, and that the multiplication of dealers is not safe ground upon which to base a theory as to the amount of trade that is being done. How, then, are we to come to a definite judgment in the matter? The evidence of my eyes tells me that there are more photographers about than there were, say, five years ago, and that the varieties of cameras, and printing processes, the competition of films *versus* glass, hand *versus* stand cameras, and other variations in economics are all in favour of a growth of popularity of amateur photography. Yet, notwithstanding these and many other arguments, my friends professed to be able to discern a falling off in public photographic interest, and a consequent decrease in the number of amateurs. Is this real, and not imaginary? and, if the former, is it due to our old foe, trade depression?

I remember ventilating this very same question with a friend quite a dozen years ago. Amateur photography, I was told, could not last; it had reached its limits; its hold on public taste was relaxing; the boom had begun to exhaust itself. As my friend was one to whose opinion position and experience lent weight and authority, I was quite won over to his view, and I distinctly remember anticipating the early descent of amateur photography to that limbo into which society had relegated spelling bees, rinking, and other passing fads. How grievously I was mistaken! Yet so convinced was I of the accuracy of my forecast, that I successfully dissuaded a clever friend of mine—a cabinet-maker—from embarking in business as a camera-maker, on the grounds that, no matter how cheaply he worked, the trade was overstocked, and there was no chance whatever of his making a commercial success of his venture. Events have demonstrated that I was wrong, and that I was excessively pessimistic in my views as regards the then future of photography. May it not be the same with my friends nowadays?

The South London Photographic Society are to be congratulated on having decided to carry forward the date of their Exhibition a few months so as to diminish the clashing and overlapping which usually occurs in Exhibition fixtures in the autumn. It is to be hoped that other societies will profit by the wise example set by the men of the south. By the way, it has not yet, I believe, come under general notice that the rival Exhibitions of the Royal Photographic Society and the Photographic Salon open to the public on the same day, viz., Monday, September 30. If this could not be helped, it is a very curious and unfortunate accident, and will, I fancy, take a great deal of explanation to prevent an impression gaining ground that it is meant for another nail in the coffin of the Royal Photographic Society. What have you to say about the matter, Mr. Maskell?

"Indignation," said Mr. Gladstone, once, "is froth, except as it leads to action." Reading the two or three letters from aggrieved operators that have lately appeared in the correspondence columns

has occurred to me that if the allegations contained in them are true and could be substantiated, a very obvious course of procedure should be taken, in order that a salutary corrective might be administered to these inhuman employers, and a warning held aloft for the benefit of other photographers tempted to follow in their scoundrelly footsteps. They should be prosecuted for Sunday trading, which would give an opportunity for the calling of witnesses, who might get a chance of testifying as to the conditions under which these wretched businesses are conducted from week to week. What a pity it is that Mr. George Brown, who writes a painful letter in the JOURNAL for May 10, did not haul up his angelic and well-behaved employer to the nearest police court for assault. What is wanted is that a case of this kind should be brought fully, and in detail, before the world, so that public opinion might be appealed to. I do not hesitate to say that if the facts were so made known, there would arise such a storm of angry denunciations and protest, that these nigger driving oppressors would find it difficult any longer to disgrace an honourable profession by their vile and unmanly persecution of their helpless *employés*.

A Fact.—Scene: Photographic Dealer's Shop. Amateur Photographer: "Do you supply those *Virgin hat* glasses for photography?" Dealer: "What do you want them for?" Amateur Photographer: "To cut down the edges with reddish shading." Dealer. "Oh, ah! I suppose you mean *vignette* glasses!"

The Imperial Institute, that monument of sycophantic toadying to the whims of royalty, is not likely to do anything in mitigation of its own failure or in furtherance of photographic progress by the exhibition that is now on view in a section of the ramified, puzzling and ugly-building at South Kensington. The Photographic Exhibition is incomplete and unrepresentative, except perhaps in the astronomical and photo-micrographical departments; but what there is of it is interesting and instructive—to those who *are* interested in, or want to be instructed in, photography. As these qualifications do not extend to an appreciable degree to the general public, it follows that the interest likely to be excited in the Institute Photographic Exhibition is very small. Such indeed, so far, is the case. Experience has shown over and over again that mixed photographic Exhibitions *per se* have little or no attraction for the general public and the result of the latest experiment appears to be entirely confirmatory of the soundness of that view. Frankly, I can conceive of nothing more "dry" or uninteresting to an intelligent sightseer or exhibition-goer than the contents of the three photographic galleries at the Institute; it requires a photographer and one *au courant* with recent advances in every branch of photography to appreciate and understand them. To such—if such there be—I utter the well-known formula, The Exhibition will repay a visit.

The Artistic Section gives opportunity for an unblushing and impudent attempt to palm off the worst features of the two Salon Exhibitions at the Dudley Gallery as "representative" of photographic art. In fact, it is virtually the Salon over again. This is too bad. The main attraction of the Exhibition will probably be the demonstrations of collotype, half-tone block, and Woodburytype printing, as well as of photo-ceramic work, which is funnily called "fashionable." In reference to the Ceramic Section, it is a pity that, when the Princess of Wales had her photographs transferred to cups and saucers, some candid friend was not at hand to tell the royal lady that many of her pictures were not very good. The Exhibition owes many of its entries to the activity and exertions ot two or three photographic journalists, whom it would be churlish to grudge in return the bold and numerous advertisements they get in the official catalogue. COSMOS.

"MONOCOCYLMETADIHYDROXYLBENZOLZIRCON-ALLYLAUROMETHYLPHTALEIN."

AN EPISODE.

SOME little time ago a tall foreigner called at my studio, and from there, I not being on the premises, came on to me at my club, and introduced himself as Dr. Morway whose name he did not doubt I was familiar with, in connexion with his researches in collaboration with Captain Abney. I had to plead ignorance, but excused myself on the ground of having been away from all professional work for some time through illness, and consequently not in touch with all current matters. After a little scientific chat, he asked me if I was going to exhibit at the Imperial Institute, telling me, on receiving my negative reply, that I ought to do, and he would tell Captain Abney, when he (the Dr.) returned to London, to send me a ticket that would allow my pictures to be exhibited without payment, and admit me free to the Institute during the continuance of the Exhibition, though I still informed him it would be useless. He then entered into full details of the above photolein compound which he had invented and explained the manner of its use in orthochromatising any ordinary gelatine plates, so as to be sensitive to all parts of the spectrum. He made one or two little technical slips, which, on my pointing them out, he explained as being ue to his lack of power of expression, though I considered that he spoke English very fluently, and he informed me he knew nine languages. I was very much interested in his conversation on the compound named, and asked him how I could procure it. He had a sample with him, and also of its fellow chemical, to be used at the same time. That was simply Dimethyldiazoresorcinrufin. Still feeling some delicacy in treating a scientific man as though he were a travelling hawker, I asked how the chemicals were commercially obtainable. I was rather staggered to learn I might have the two bottles there and then, and the price was ten shillings. After showing the non-poisonous character of the highly fluorescent compounds by drinking a tumbler of water impregnated with one of them, and at the end of some further conversation on colour photography and orthochromatic plates, this highly intelligent doctor left me with a smile that was bland but decidedly not childlike. He previously left me his address in St. Petersburg, from where he would be happy to correspond with me, and all those purchasing ten shillings' worth of fluorescent liquid. He wrote down for me the date on which the combined paper by himself and Captain Abney was published in THE BRITISH JOURNAL OF PHOTOGRAPHY, the genial editor of which (Mr. Taylor) he well knew.

A little whille afterwards a scientific friend in the city called on me to know if I could oblige him with the sight of a copy of the JOURNAL of that date "first week in September 1894." "I suppose Mr. Morway has sold you two bottles?"

"Yes, and splendidly they work," he replied; "I have just taken a photo-micrograph by their aid that I had vainly endeavoured to do previously when using ordinary plates." I had to say that I had vainly endeavoured to find that paper either at the date given or any other date.

Now, it occurs to me that other photographers will have purchased samples of the two liquids; possibly they also would like to find that paper. I should very much like to find it and still more to find that intelligent foreigner who handed bottles of strange liquids from beneath the voluminous folds of a large inverness, in exchange for a paltry half-sovereign. G. WATMOUGH WEBSTER, F.C.S.

PS. I forgot to add, that he informed me the stuff contained fifteen per cent. of gold, and, on my informing him that at five shillings an ounce he would be losing money, he replied he did not think he was—a statement of belief which, no doubt, was well grounded—but "I do not work at this for money's sake," he replied. G. W. W.

THE EQUIVALENCE OF THE ALKALIES.

IT does certainly appear as if the construction of an accurate table of alkalimetric values is fraught, as Mr. G. E. Brown, A.I.C., suggested a fortnight ago, with difficulty to the compiler, and his own latest attempt in that direction affords the best proof that has yet been offered. I do not wish to parody his remark with reference to the table I gave three weeks ago, but I must say, in the interests of photography, it is to be regretted that such a table as his has been published.

So far as my table is concerned, I have no wish to make the slightest alteration in it, the many and grave inaccuracies it is stated to contain existing only in Mr. Brown's imagination and in his own

tabulated statement, as I shall attempt to prove; and I shall do no more now than enter a mild protest against the dogmatic way in which he has erroneously charged me with propagating false doctrines. When I read his opening remarks, I candidly admit I was struck with the possibility that there might be some slight inaccuracies, for the whole of the calculations were made, along with many others, when I ought to have been in bed, and without time for any verification whatever beyond a comparison with figures previously published by M. Londe. It was with no little surprise, therefore, especially after the rather forcible remarks of my critic, that I found my figures to be absolutely correct, and that his, where they differed from mine, were based upon the assumption of incorrect combining equivalents.

In the first place, Mr. Brown doubles my equivalents of sodium and potassium hydrates, or, in other words, reduces their working value by one-half, and *per contra* gives the carbonates relatively a double strength. I shall not stop here to argue the point as to whether the hydrates are to be considered as NaHO and KHO respectively, or $Na_2H_2O_2$ and $K_2H_2O_2$ as Mr. Brown would have them, but I would point out to him that the title of my article containing the table he complains of was *The Comparative Developing Values of the Alkalies*, and that in the course of that article I pointed out that the combining and *developing* values were not necessarily the same. In fact I tried to emphasise a point I first brought forward ten years ago (*vide* ALMANAC, 1885, page 37), namely, the difficulty, if not impossibility, from this very reason, of directly comparing the caustic alkalies and the carbonates for developing purposes, my contention having been, and still being, that even when giving the higher values, or, which is the same thing, the lower combining equivalents, the hydrates are, still, *more* energetic developing agents than the carbonates when used in proportionate quantities. The figures given in my table are based upon that view, which I have thoroughly proved to my own satisfaction years ago to be correct, and of which Mr. Brown might have satisfied himself by actual trial with less trouble than the writing of his article involved. That M. Albert Londe takes the same view is proved by his table being based on the same calculations, and only marred by one or two accidental inaccuracies and omissions.

If any further proof of a practical nature were wanted, it is singularly enough supplied in the same issue of the JOURNAL that contains my "castigation," and from an entirely independent and also authoritative source. At page 302 Mr. W. J. Stillman, who was an authority on photographic chemistry and alkaline development years before nine-tenths of the photographers of the present day, amateur or professional, knew what alkaline development was, has a letter in which he compares the practical developing values of potassium hydrate and potassium carbonate; and if Mr. Brown will look at those figures of a practical man, not the paper calculations of a theorist, he will find they *more than* prove my table to be correct. I say more than prove, because, while I give the relative values of caustic and carbonate of potash as 1 to 2·464 Mr. Stillman puts them down as 3 to 1; whereas Mr. Brown's figures make them only 1·232 to 1!

The only further explanation that is necessary is that Mr. Stillman's experiments were made with very short exposures, and with the developing power carried to the farthest extreme possible, and the only ultimate difference was that the caustic potash worked in half the time; for the reason, first of all, that it was used in higher proportion than its proper chemical equivalent, and is, moreover, devoid of the chemical restraining action which I have previously endeavoured to show is possessed by the carbonates. But, according to Mr. Brown, twice the quantity of the caustic alkali would have to be employed to produce an equivalent result. If Mr. Brown's theory be correct, and does not agree with practice, then I can only say, as Stephenson said of the "coo," so much the worse for theory.

I must now turn to another point, to which, in my hurry, I omitted to refer in my article three weeks ago, namely, the equivalent of sesquicarbonate of ammonium. In my table, published in the ALMANAC ten years ago, owing to the uncertain character of the sesquicarbonate, I included in its stead a problematical solution of the normal carbonate, a substance which, as I noted in a previous article a few weeks back, is unknown in the separate state and can only be obtained by calculation in solution. This, as was pointed out to me at the time, was scarcely of any practical use to the ordinary photographer, and it was only when too late to make the necessary alteration or correction that I completed my experiments with the sesquicarbonate. These were made with a sample of the salt specially supplied for the purpose by a firm of manufacturing chemists of the highest eminence, and which, although not perhaps identical with the ordinary sesquicarbonate of commerce, was a far nearer approach to the real or theoretical article.

This is regarded by the best authorities as a mixture of one part of the normal carbonate and two parts of the diacid carbonate together, with two atoms of water of crystallisation, as represented by the formula, $(NH_4)_2CO_3\,2(NH_4HCO_3)+2H_2O$, with a combining equivalent for ordinary chemical purposes of 290. In my volumetric estimation, however, I entirely failed in getting any results that corresponded with the hydrated formula, although they agreed, with singular closeness, with a possible anhydrous salt having a combining equivalent of 254. In composition, in fact, the particular sample I used came nearer to carbamate, or so-called anhydrous normal carbonate (though I was assured it was not that substance), than to the hydrated sesqui-salt, and, for practical purposes, I adopted the figures which most nearly agreed with actual results. It was these figures that were made use of in my table a fortnight since, and this is the only instance in which that table differs from the one of ten years ago. I ought to have given this explanation at the time, but forgot it.

Now, by reference to the above formula, it will be seen that there are three atoms of carbonic acid to displace, and that therefore the actual combining equivalent for practical purposes is—rejecting the 2 atoms of H_2O—$\frac{254}{3}$ or 84·6, and that is the equivalent upon which the figures in my last column were calculated. Turning to Mr. Brown's table, it will be seen that he has adopted the equivalent of 127, which can only be arrived at on the supposition that he, also, has omitted the water of crystallisation, either intentionally, or, possibly, through carelessness, and divided the equivalent by $2-\frac{254}{2}=127-$, which he must know, as a practical chemist, is, to quote his own words, a "grave inaccuracy." Or, by assuming a formula representing the sesquicarbonate as an anhydrous salt containing two atoms of ammonium hydrate, and one and a half of carbonic acid, figures very nearly approaching his 127 are obtained; but this, I submit, is equally removed from chemical accuracy, and I must respectfully, but firmly, insist on carrying the war into the enemy's camp by charging him with the only real blunders that have as yet appeared in these tables. The greatest of "chemical arithmeticians" may make a slip; we are none of us infallible, and there are such things as differences of opinion, if not of fact; and it would have been more in consonance with the practice of chemists generally to have argued the point before rashly condemning my table. I may, of course, be entirely wrong in my own views, in which case, if Mr. Brown will convince me, I shall only too willingly admit it; until then I shall refrain from saying any more on these points of difference, since it is often a far easier and pleasanter task to climb up than, as the Americans say, to "climb down."

Other matters referred to in Mr. Brown's article are chiefly questions of opinion or of convenience, as, for instance, the substitution of solution of ammonia for ammonia gas. This, as the Editor will remember, I had intended doing, or rather to give the solution as well as the gas, but it did not occur to me in time. I do not at all agree with Mr. Brown in believing the column referring to the solution to be more useful than, or as convenient as, that of the gas, or that ·880 solution is of any practical use at all. In my experiments of ten years ago I adopted a solution containing practically ten per cent. of ammonia gas, and this can be readily made from any "shop" ammonia, whereas the real ·880 is to a great extent an imaginary article, difficult alike to obtain and to keep.

The ten per cent. solution can be kept in the dark room, and used with a dropping tube or minim measure; nobody, I imagine, would ever resort to the absurdity of weighing ammonia solution in the dark room, and, for mixing up stock solutions outside, the practice of weighing is inferior in convenience, and presents no advantage as regards accuracy over the *measurement* of ammonia solution of known strength.

It is easy to calculate the theoretical quantity of gas in liquid ammonia of any specific gravity, and, by either weighing or measuring to take the quantity required to make it up to such a solution that ten minims carry one grain by weight of the gas. The column referring to the gas is useful for this purpose, and would represent the quantities by weight; that referring to the solution would represent the volume, and would give the actual weight by simply dividing the number of minims by ten.

Mr. Haddon's specific gravity bulbs are very useful for this purpose, and I have used what is practically that plan in a less compact and convenient form for years past. A thread of black silk is tied round the tube of an ordinary hydrometer at the figures ·960 for convenience of reading; one volume of "shop" ammonia and two volumes of water are mixed together, and seldom require much adjustment with either water or ammonia to make the hydrometer stand at the right level, and this forms what is so near a ten per cent. solution of the gas that the difference will not do much harm any how.

As to the substitution of anhydrous for crystallised carbonate of soda, from a purely chemist's point of view, the former is, as Mr. Brown says, undoubtedly the more definite compound. I have tried both, and as a matter of fact, get greater uniformity *with less trouble* with the crystals; while as to the "common or garden" photographer—to borrow the elegant description recently attributed to one of the leading lights amongst them—he would be frightened out of his wits at the bare thought of having to translate all his printed formulæ from "crystals" to "anhydrous." The ordinary washing soda obtainable anywhere, if in good condition, *i.e.*, not effloresced, is as reliable for the photographer as the "pure anhydrous," though perhaps Mr. Brown might find it vary a little for analytical purposes.

Let me just say in conclusion that Mr. Brown seems to have missed the point of my argument, or probably has not read the article in which I expounded it a few weeks ago. This is, as I first stated in the ALMANAC, that it is, I will now say, *impossible* to compare on equal terms the caustic alkalies and their carbonates. That though for chemical purposes, eighty parts of NaHo will be required to neutralise the same quantity of oxalic or other acid as would be taken up by 106 parts of carbonate of soda, we are not altogether neutralising acid in development. That, as a matter of fact, forty parts of the first will do as much developing work, and, moreover, do it quicker, than 106 of the second, as my table states. This was long ago recognised by my friend, Professor W. K. Burton, and is further proved by Mr. Stillman's letter in last week's JOURNAL.

I may mention, as one more circumstance in my own defence, that when Professor Burton gave a lecture on development before the Chemical Section of the Society of Arts in April, 1885, he did me the honour of asking me to extend, for his use in that lecture, the table I had produced in the ALMANAC. This I did, and it was subsequently published in the *Journal of the Society of Arts*, and, I believe, in at least one or two other technical journals altogether unconnected with photography. That table, with the solitary exception I have mentioned of the alteration in regard to carbonate of ammonia, is based on precisely the same figures and calculations as my more recent one, and has so far not, to my knowledge, been in any way impugned. If, therefore, I am wrong, there is all the more credit due to Mr. Brown as being the first chemist in ten years to discover the fraud.

W B. BOLTON.

PHOTO-MECHANICAL NOTES.

IN another place I have suggested that by applying the half-tone screen to intaglio engraving the ideal half-tone printing is likely to be most nearly realised. I claim no originality for the idea, for such application has been made, and probably many workers are at the present moment engaged in perfecting this process. I have seen results in this direction which are certainly very fine. But it is not to be supposed that such a process will supersede the photogravure process with the dusted grain. The bare suggestion that the half-tone screen should be applied to intaglio copper etching is liable to be misunderstood, and the artistic public, which has slowly been brought to an appreciation of the merits of photogravure, may be up in arms against the threatened invasion of the mechanical grain. It should be stated, therefore, that the idea is not to supersede photogravure, as we now understand it, but to improve the results of the half-tone process.

We all admit that the mechanical grain is "hateful," and it is the aim of all thoughtful process workers to endeavour to make it less so. To a certain extent we may do this by increasing its fineness, but the limitations of the process in this direction have practically been touched. The possibility of clearly printing a relief stops at 175 lines to the inch, though careful printing has given us a few excellent results of 200 lines per inch. When we remember that in the most delicate wood-engravings the cutting of the finest parts rarely, if at any time, exceeds 150 lines to the inch, we have some proof that 175 lines in a process block is a reasonable limit, which will tax all the efforts of the most skilful letterpress printers. At this limit the grain will still be visible to the naked eye, so that, if we require greater fineness, we must seek some other method of printing.

Now, we know that by the intaglio method, on either copper or steel, the limit is pushed very much further in the direction of fineness; in fact, it may be said to end with the ability to grind ink of a sufficient degree of fineness to enter the lines or grain. We may, at any rate, safely go to 300 lines to the inch, and at that point a half-tone grain in the finished print would be only microscopically visible, and would be still further overcome by the slight smearing of the ink, peculiar to intaglio printing.

Of course it may be urged that there will really be no advantage over the ordinary method of photogravure. So it may seem at first consideration, but the hope of experimenters in the process is that such plates can be printed by more rapid and ready means than are those of the present photogravure process. Whilst it is well known that all attempts to ink and wipe photogravure plates by any other method than hand means have been a failure, it is a fact that automatic machines are being used successfully in commercial copper-plate and steel-plate printing. The reason of the difference is obviously in the character of the sunk portions, the lines of a commercial engraving being more uniform in depth, with sharp edges, having, in short, the necessary ink-holding qualities, which allow of the plate being surface-wiped.

Apart from this advantage secured in the matter of printing, there is, to my mind, a better range of tone, and especially better high lights than in the photogravure method. The new process, if it comes to be successfully worked, will be especially useful in providing a medium quality of book and magazine illustration, something better than the present half-tone, more uniform in quality than collotype, and cheaper than photogravure. If the exigencies of cheapness in book production demand something cheaper than photogravure, why should any objection be raised when even the cheaper article is better than the "hateful" half-tone? Process work, whatever its kind—even photogravure—is a necessity of a utilitarian age, and sentimental outcry will not stop its progress. If photographers on the one hand, and wood-engravers on the other, had but grasped its possibilities earlier, they might have reaped advantages which are now all but lost to them.

Whilst preparing the foregoing notes I happened to pick up a very beautiful photogravure proof by a leading German house, and on proceeding, as a matter of curiosity, to examine the grain with a powerful glass I was somewhat surprised to find, intermingled and almost hidden in the dusted grain, a very fine mechanical grain running in a chain of joined dots in one direction. The grain in this case was not "hateful"—it could not, in fact, be offensive, because it was quite invisible to the naked eye. The ruling was about two hundred to the inch. Whether the picture owed its vigorous colour and sparkle to the presence of this mechanical grain I cannot say, but the richness of tone gradation was quite unusual, according to my experience, of photogravure results. It may be a revelation to some people to find that the mechanical grain has crept into photogravure without their knowing it, and the result is not so hateful, after all. The fact is, the mechanical grain is like a dog with a bad name, and as it has become fashionable for artists and critics to describe it as "hateful" and "pernicious," and I am afraid these adjectives and sundry synonyms will stick to the process even after it has ceased to deserve the reproaches. There is, unfortunately, a good deal of sadly bad half-tone work done, and the process, as a whole, is blamed for it. Let me put in a plea for discrimination on the part of our critics.

Another thought strikes me. Is not the suggestion to apply the half-tone process to intaglio engraving an example of the way original ideas are allowed to fall into desuetude because they are broached before their time? Fox Talbot's pioneer efforts in photo-engraving were by intaglio etching, and he first suggested the use of lined screens. Again, Baron von Eggloffstein, whom our American friends are trying to immortalise as the "father of the half-tone process," devoted all his efforts to intaglio engraving on steel, his half-tones

being broken up by means of a diamond-ruled line screen. His work is dated 1861. Thus do old processes acquire a new significance in the fulness of time.

Photogravure work in this country has made tremendous strides in popularity in the last two or three years, but it is one of the most conservative of processes, and no one seems to care to depart very widely from the orthodox Talbot-Klic method. The appliances for the process remain, as they have always been, very few and simple, and it may be said to be the only one of the photo-mechanical processes which an amateur can practise without purchasing a lot of apparatus additional to his ordinary photographic outfit. By the Warnerke process photogravure is rendered still easier of accomplishment by means of the ready-prepared tissue, which can be printed by artificial light. The practical utility of this method in photogravure work has hardly been grasped as it ought to be.

Those who are interested in the application of the mechanical grain to intaglio work may see a fair example shown in connexion with the case of Levy screens at the Imperial Institute Exhibition. This example is a pure half-tone grain, without any intermingling of a dusted grain.

WILLIAM GAMBLE.

STUDIO FURNITURE AND ACCESSORIES.

[Autotype Notes.]

IT may readily be inferred by the reader, from all that has gone before in these chapters, that I am no advocate for elaborately painted backgrounds, and that, when an open air effect is desired, or indeed when any effect other than a perfectly plain background is sought for, the *suggestive* method first attempted by Wall, and afterwards commercially carried out by Davy and others, is the one to be adopted. Let it not be imagined, however, that I am an advocate for a perfectly plain background unbroken in tint.

> "A wall so blank, my shadow I thank,
> For sometimes falling there"

is not to my taste by any means; and by the way, speaking of shadows, it is very easy to arrange the background so that the shadow of the figure absolutely falls in the right place. Place the plain background angle-wise, and then, by means of a curtain or large folding Japanese screen, cut off light so that a shadow is thrown on the side in the direction of the light of the studio. The effect is right when the shadow which falls on the background gradually softens into the local tint. Now place the sitter somewhat near the background, and take care that the studio light is sufficiently high to throw the shadow from the head of the sitter on the light side of the background somewhat below the shoulders. A few trials will make all this quite easy, and, of course, the effect is absolutely true, and therefore far better than the fictitious shadows so frequently seen in the plain shaded backgrounds supplied by the dealers.

No picture, and therefore no photograph claiming to be pictorial, can please the eye with varied light and shade confined to one portion of it, and plain, unbroken tint occupying all the rest of the space. The incongruity is felt, for it is contrary to nature. Light and shade, of course varying in force, pervades every scene, and therefore a plain, unbroken background must be out of harmony. It is true this monotonous effect is now rarely seen, but once upon a time it was the rule rather than the exception.

The ambitious photographer would do well to imitate the ways of the painter, and never pass an old furniture shop or curiosity store without curiously examining the wares offered for sale. I never knew a painter yet who could not show one some choice example of furniture, costume, or old armour, frequently picked up for a mere song, which he regarded as priceless, and from which he would only be parted by robbery or death. In an illustrated notice of my old friend, H. P. Robinson, one of his early portraits showed a grand piece of old tapestry as a background, and my mind was immediately put back more years than I care to count up, at any rate it was taken back to the dark or rather black ages of photography, when every worker in the art carried the hall mark of his craft at his fingers' ends. Indeed, I have known some enthusiastic workers so carried away by their ardour that, not content with the black stain on their hands, they have sent the argentic fluid up to their elbows. How the laundresses must have blessed these black craftsmen! The white shirt was merely called so by courtesy, for by no stretch of the imagination could it justly lay claim to the title.

The importance of rags—for that is the name contemptuously employed for the odds and ends of costume so useful at times—must not be overlooked. I remember an old needlework *fichu*, of about the time of Marie Antoinette, that I picked up for a mere trifle, that in course of time became simply invaluable, for, whenever a sitter came with hard cutting drapery at the throat, impossible to manipulate, I generally managed to induce, though not without difficulty sometimes, the fair victim to bare the throat, and put on the drabbled coffee-coloured rag. The result was always such an agreeable surprise, that, after a time, this same apparently worthless article was frequently asked for. As a matter of fact, it was a very beautiful example of needlework, but its beauties were not apparent to the casual observer.

Faulkner always kept ready to hand a complete equipment of quaint children's costumes. But, of course, his mob-capped, dainty little beauties are well known to most of my readers, so I need not say anything further about them.

In the employment of drapery, such as curtains, table covers, &c., it is most important to bear in mind the importance of texture as well as colour. The same, of course, applies to carpets. Frequently the wrong side of an Indian or Persian carpet will help the effect of the picture far better than the front, for, though the pattern will still be well marked, the contrasts will be lessened, and more harmony will result in consequence.

Accessories of all kinds should be helpful to the figure, and therefore only introduce as much as is necessary for the purpose. The crowding into the picture of a lot of unnecessary material is still frequently seen, though it must be admitted the fault is not so common now as in past days. The first question the photographer should ask himself when arranging his sitter is, Does this or that article of furniture or drapery help? If not, away with the delinquent, when it will probably be seen that the effect has gained by its absence. The high lights on polished furniture are always made unduly prominent by photography. A comparison between a photographic copy of a portrait by an eminent painter and a photograph pure and simple will show how, whilst fully expressing the high lights on brightly polished surfaces, the painter manages to prevent the disturbing sparkle so constantly seen in ordinary photographs. The proper effect is there, but the harmony is not disturbed.

Adam Salomon always toned down the high lights of the accessories, and was very fond of employing unpolished oak furniture. I well remember a favourite oak chair of mine that I was compelled to manipulate with sand paper at irregular intervals, for the woman who kept the studio in order would insist, in spite of remonstrance, on applying furniture polish. She said it looked so dirty and untidy that she could not keep her fingers away from it.

The figure must occupy first place in a portrait, and every accessory must be subordinate. When the critic, in praising a portrait, dwells immediately on the lovely pattern of the lace, or other secondary detail, that picture is condemned by the praise; and in like manner, should admiration go to the chair or couch, or any other article of furniture, the photographer has failed as an artist—the furniture was in the way.

In conclusion, I would say, Select accessories with care and due consideration. Be always on the look-out for suitable materials, and never stock the studio with furniture made for photographers, and sold by the gross.

VALENTINE BLANCHARD.

NEWSPAPER ILLUSTRATIONS.

[Photographic Society of Philadelphia.]

"As bad as a newspaper cut" does not mean as much as it did in those not very distant days when newspaper illustration had not reached the position which it at present holds, thanks to photography. I do not mean to say that there are not many poor cuts still printed in the newspapers, but that the wide-awake modern daily newspaper, which keeps abreast of the times in other respects, prints every day in its columns pictures which, when we consider the conditions under which they are made, are as marvellous as many other modern institutions which cause vastly more public wonder and admiration. It is, however, perhaps only a fresh instance of the truth of the old proverb, "Familiarity breeds contempt."

To none of the arts, sciences, or industries, has photography been a better servant than to journalism; though, as photography is in this case only the means and not the end, its services are likely to be overlooked by those who do not see behind the scenes.

Newspaper photography has peculiar features of it own—and they are all "instantaneous." It has but little to recommend it as photography for its own sake, because it is not photography practised as a science, a recreation, or a study, but purely as a mode of "getting there." The newspaper photographer is not likely to keep stores of his old negatives and prints for their own beauty, and probably could not if he would, because he does not have time to wash them for posterity's sake. The ordinary careful amateur who visits a landscape scene a half-dozen times before he catches the right light effect, and spends half an hour in

developing the plate, which he washes in running water all day, and then waits for a bright, clear day to make prints from it for his friends, would be likely to have some of his traditions upset on watching the newspaper photographer at work, and be inclined to consider the latter as rather a reckless young camera fiend. With the latter the proper light is just enough to make an exposure by. He wants a negative, as good as possible, of course, but he wants it right away, because it is a daily newspaper he is working for, and not a quarterly review. As for prints, he only makes one from each negative at the most, and its only use is as a basis for another negative, which, from the ordinary photographic point of view, is worse than the first, with clear glass and intense black right up against each other, and no half-tones, because the newspaper press despises half-tones and would print them as nasty black smudges, simply spoiling so much clean white paper.

The qualities which a newspaper illustration must have in order to be printable on rapid presses, and look well on the sort of paper which newspapers are compelled to use, limit the choice of processes practically to line etching on zinc and certain mechanical processes which imitate its effects. With the history of this process it is not necessary to deal, and with the small details of manipulation I will not attempt to enlighten or weary this audience. In fact, I should have no right to do so, as such information on the technical side of zinc etching as I may be able to lay before you has not been gained by practice of the art, but by continued rubbing up against it in the line of duty.

We will suppose word has just been received by the City editor, from police head-quarters, that a boiler in a Kensington mill has exploded and caused a serious loss of life and property. Of course, reporters are sent promptly, and a few years ago that would have been sufficient, but now the illustrator is expected to be "on the spot" with the reporters, and only a little behind the firemen and the police. It may be a man with a portfolio and a pencil, or a man with a hand camera, or maybe both. We will let the sketch artist take care of himself, and follow the man with a camera while he takes snap-shots at that pile of wreckage, or at the big hole in the wall of the nearest building, through which part of the big flywheel has been hurled. The exposures made, our camera man starts for his dark room to see what he has got. He develops his plates, fixes them, and selects two or three of the best, washes the hypo off the surface of the films, squeegees pieces of wetted bromide paper on them, exposes them to the electric light for a moment, develops and fixes them, rinses the hypo from them, and they are done. Very sloppy photography, some of us might say, and so it would be, if negatives and prints were intended to last for more than half an hour.

If there is not much hurry, the bromide print may be tacked up behind a small electric fan and dried. This process would only take a few minutes, but a quicker mode is to squeegee the still wet print on a piece of glass. In this shape it is handed over to the process photographer, who fastens it by means of drawing tacks against his copying board, turns on the big electric arc light, and makes a considerably enlarged copy by the wet-collodion process. Inside of five minutes from the time he pulls the slide from the plate-holder he has his negative ready to make a print from, thanks to the heat from a gas stove and the aforesaid electric fan. Or, if the case is one of rush, as late at night, he puts the wet negative in the printing frame, lays a thin sheet of mica upon its tender film, and on the mica a sheet of plain salted and silvered paper. Under the powerfully active rays of the arc light two minutes will suffice to print a plain image. This print need not be fixed, as the draughtsman will not give it time to fade. It is hastily mounted on cheap cardboard, dried over the gas stove, and turned over to the artist, who has laid aside the sketches which he had to fall back upon in case the camera man had failed.

It is now an easy task for the trained draughtsman to go over the photograph with pen and India ink, and translate the picture into lines, which are the only things the rapid newspaper press of our day recognises. The leisurely printed weeklies and monthlies can have their half-tones on copper, and photogravure frontispieces, as well as the one sort of plates which the newspaper is obliged to make its only resort.

When the artist has finished his drawing over the silver prints then comes more photography. The photo-drawing goes back to the operator, who pours over it a solution of bichloride of mercury, which has the apparent effect of dissolving away the photograph, and leaving only the India ink lines. As a matter of fact it bleaches the photographic image white, so that it is not distinguishable from the white paper on which it was made.

The drawing now takes its turn in front of the big camera and the arc light, and from it another wet-plate negative is made, reduced to the exact size which the illustration is to be when finished. When the developer is applied, an image comes up which we would call decidedly hard. In fact, the harder it is the better the process photographer likes it, and the more popular he will be with the etcher.

Plain development is not enough, so our operator, after getting all the density he can by developing and redeveloping, without fogging the transparent portions which represent the black lines, fixes and bleaches the negative white, usually with a bichloride of mercury or a bromide of copper solution, and blackens it with a solution of ammonium sulphide or nitrate of silver. If the negative takes on the semblance of a stencil plate *i.e.*, looking like a piece of sheet iron with the lines of the picture cut through it, the intensification has been a success.

The next step in the process is the "stripping" or turning of the negative. If the block were made from the negative as it is at this stage, the picture in the paper would appear reversed—tin-type style—so a reversed negative become a necessity. In the now almost lost art of wood-engraving this obstacle was overcome by drawing the picture on the wood reversed. In modern process work the some thing can be accomplished, and frequently is, by using a right-angled prism, or a mirror to produce the reversed negative; but the zinc etcher is much given to "stripping," as it is usual in newspaper offices to etch several pictures at one operation and on the same sheet of zinc. He probably has, besides our disaster illustration, a portrait or two, a fashion plate, and maybe one or more pieces to be used in the advertising columns. In fact, one has to be almost as careful about the picture he looks at in the newspapers nowadays as of the wonderful stories he starts to read without looking how they wind up, or he may find that the fair lady whose beauty he is admiring is not the heroine of the latest big scandal, but only Mrs. Muggins of Squedunk, who has recovered her good looks by the casual wearing of Dr. Sparks' magnetic belt.

But this is a digression. To return to our subject, the negatives are flowed with a solution of rubber in benzole, followed by a heavy coating of collodion to thicken and strengthen the delicate film, and are then placed in a dilute solution of acetic acid, which soon dissolves the layer of albumen that holds the collodion film to the glass. This allows the films containing the pictures to be lifted from their original supports and laid the other side up, on a piece of thick plate glass. The films are squeegeed tight to their new support and dried, and the negative is handed over to the etcher.

This active young man has by this time a sheet of zinc nicely polished with willow charcoal, coated with a solution of ammonium bichromate and albumen in water, and dried. More photography, you will observe.

The negative is placed in the printing frame, a ponderous affair built of oak and put together with strong iron bolts. The glass which supports the negative is an inch thick, and the back of the frame is studded with fifteen or twenty set screws which are necessary to press the stiff sheet of zinc into close contact with the negative. A grain of dust between those two pieces of glass means a disaster, for, besides the expense of replacing the glass, there will probably be no picture in to-morrow's paper, as such a mishap is sure to occur when it is too late to remedy it.

Assuming that this is not the occasion of such ill luck, however, the frame goes under that big arc light, and in the course of about ten minutes there appears a very faint image on the coated zinc plate. The etcher takes what looks to us like a queer means of strengthening it. He seizes a big roller covered with a greasy-black ink, and rolls it all over that shiny plate, and covers the whole surface, picture and all, with the ink. The plate, which is now blacker than your hat, is put into a tray of water to be developed. The magician, for such he seems, takes in his hand a tuft of cotton and begins gently to "swirl" it around in the water over the blackened plate. Wherever the cotton touches there begins to come out of the blackness a picture, almost, if not quite, as marvellously as did the image on your own first negative. Soon all the ink is gone except that which sticks to the lines impressed in the bichromated albumen film by the light striking through the transparent portions of the negative, and we have a beautiful image of black on a background of polished metal. This could go into the acid bath, and the ink would resist long enough to allow a shallow etching to be made, but to permit of the eating out of the metal which is in the way of the picture these delicate lines must be strengthened, and over them is dusted powdered dragon's blood—a resinous substance, which by the heating of the plate melts and unites with the ink, and effectually protects the metal which is to form the lines. After a short period in the acid bath the plate is taken out and again powdered, the melted resin running down on the sides of the lines, and thus protecting them against undermining by the action of the acid. This is repeated as many times as may be necessary to get proper depth for the etching, and might be continued until holes had been etched through the plate. In practice, however, a machine called a "router" is used to deepen the depressions in the metal where the blank spaces of the cut are to be. The "router" is a drill-like tool, rotated at very high speed, and mounted on a radial arm, which can be moved in all directions, and quickly cuts out the metal to any desired depth. After this all that remains to be done is to trim the edges of the bit of zinc carrying the picture and nail it on a base of such thickness that the finished block shall be of the exact height of the type, beside which it will stand in the newspaper page.

How long has all this taken? In an English book on modern methods of illustrating, a reference is made to newspaper work such as I have described, and the somewhat surprising statement is made that "three or four hours will suffice for the etching, and thus, in case of pressure, a block can be ready for the printing press in five or six hours." Such a rate may do in cases of "pressure," as that term is understood in England, but newspaper etching plants in America which cannot take a cabinet photograph and turn out a portrait block ready for the printers in an hour have a first-rate title to the term "slow."

In at least one establishment of which I have knowledge, this is considered an easy allowance for a hurried portrait, including the copying of the original photograph, making a plain silver print, drawing, making the line negative, printing on the zinc, etching, routing, mounting, and taking a proof.

I have here a proof impression of a cut showing the scene of a quintuple murder in the outskirts of Camden. The two men who went on this assignment caught the ferry-boat leaving for Camden at 11 p.m., struck a bargain with a hackman on the other side, drove three miles behind a horse which threatened to die once or twice before he got to Cramer Hill, sketched the premises by gaslight, caught the twelve o'clock boat back to Philadelphia, and delivered the completed drawing to the photographer and etcher early enough for them to produce the finished block in plenty of time to be used in the paper at two o'clock, the usual hour of going to press.

The result is a faithful likeness to this extent that the owner of the house started in surprise when his eyes fell upon it in the paper next morning, before he knew what had happened to make his property famous.

The specimens here shown were not made in such a hurry, as the occasion did not demand it, although the time spent on the careful drawing of this excellent portrait probably did not exceed half an hour.

After the cut is finished there are still other processes which affect the result as it appears to the newspaper reader. It is bound to lose some of its brilliancy and cleanness of line in the stereotyping process, though with the best of workmen in this department the loss may not be serious, while still appreciable.

The pressman also has a large responsibility as to the final appearance of the newspaper illustration, and no part of the paper will so soon show the effect of too much or too little ink, too light or too heavy impression, &c., as the illustrations.

If the illustrations do not "show up" well when the publisher and the editor in chief, the severest of all critics in most cases, look over their papers in the morning, some one is going to hear about it. Then the pressman and the stereotyper are pretty sure "those fellows upstairs don't know how to make cuts," while the draughtsman, the photographer, and the etcher can't be convinced that "the fellow in the cellar" knows how to print them.

I will leave it for you to say whether they do not all deserve more credit than they usually get. THOMAS WAKEMAN LANE.

"A. P." JOTTINGS.*

IT was my pleasing duty last session to give an elementary demonstration on this process. The syllabus, at least, so described it, but as there were only about six members present, of whom I think five at least were more proficient than the demonstrator, it did not turn out so elementary, after all. I am sorry that more members who had not seen the process demonstrated were not here, as I think, after reading about it, one is apt to think it a very dirty and difficult method of printing, whereas I think that, next to platinotype, it is the simplest, and I myself lose far less prints by it than by the latter. The only drawback to it appears to be the fact that reversed negatives are required. Well, for certain subjects, our architectural and street views, they should be used, but, if you are simply going in for pictorial work, it seems to me that it does not matter in the least whether the picture is reversed or not. Take, for instance, any simple subject, say a sailing boat, with water and sky; can it make the slightest difference to any one whether the boat is going to the right or to the left? or a picture of reeds and water in the foreground, and a tree or two in the middle distance, with hills in the background? The same remarks would apply. Where I draw the line myself is when taking views of well-known places or of buildings. To exhibit a photograph of the Houses of Parliament, say, with the Clock Tower and the Victoria Tower reversed, would, in my opinion, be decidedly wrong, as we are in this case not giving a truthful representation of a well-known fact; but in some cases it is rather difficult to decide as to the legality or otherwise of so doing. Take, for instance, such a view as the favourite one: near Richmond Bridge, with barges in the foreground, would it be legitimate to exhibit this reversed? It is difficult to decide here, because we are not, in this case, so much taking a topographical view as trying to make a picture. If topographical, it should be exhibited in its natural appearance; but, if a picture, it seems to me to be optional. The only thing is, that the view is so well known that the fraud is at once detected, and I should therefore not reverse it. Nowadays the critics are so keen on finding any fault in an Exhibition that one has to be careful. At the last Pall Mall Exhibition there was a view of the Cornish coast, and a view of the river at Richmond, *not* showing the bridge. The one of the Cornish coast was declared, by the A. P., to be reversed. Well, it may have been; but, although I have seen most of this coast, I should not care to vouch for the truthful representation of it in any photograph, but I am quite willing to take an affidavit on the fact of the Richmond one, which escaped the keen eye of the A. P., being reversed, as it was my own. And yet, notwithstanding the familiarity of the view to most Londoners, no one appears to have noticed it. Of course, they may not have thought the view worth looking at, but equally, of course, I am not going to take *that* view of it. I take it as a proof that, in purely pictorial work, reversal is perfectly legitimate. You may say, Why reverse at all, when by going in for double transfer you can do without it? If it were only for the purpose of saving the little extra trouble of the second transfer, I should certainly not recommend reversal; but unfortunately, in double transfer, we are limited to one kind of paper, and that a smooth glossy one, whereas with single transfer we can use any surface, from the smooth and glossy up to the roughest Whatman; and this brings us naturally to the much-debated rough *versus* smooth controversy.

* Continued from page 312]

The followers of the shiny school will ask, Why use rough paper and lose the fine detail? I have a distinct recollection of an artist who gave a paper before us in this room, asking why we wanted to copy painters by using rough paper to make our photographs like sepia drawings? A photograph, he said (and by a photograph he meant, I suppose, a highly glazed brown or purple production so often seen in a shop window), as a photograph, was to be admired, but as soon as it wandered from its legitimate sphere, and tried to ape the painting, it was beneath contempt. There are, two answers, I think, to that argument. In the first place, a photograph does not depend on its likeness or not to a painting for pictorial merit. It is either pictorial or it is not, and the comparison with other works of art is altogether beside the mark. In the second place, I deny that in using rough paper we are copying artists. These people, who talk so glibly of what they are so ignorant of, will perhaps be surprised to learn that in using rough paper we are not using a new process, but are simply returning to the paper that was used by the first photographers. When albumenised paper came in, it was found so much more convenient to use the paper already prepared by the manufacturers, and they found a fine, close-grained paper so much more useful—if not necessary—for their work, that the home-sensitised rough paper was gradually ousted. But not permanently. When the art side of photography began to be studied a little, the advantage of the rough paper for certain effects was at once recognised, until at the present time there are as many pictures on the rough as on the smooth at any first-rate Exhibition. And this paper would hardly be complete without some reference to Exhibitions generally, and one in particular. And therefore, though with great diffidence, I will venture on a jotting or two on this most important subject.

And we might first, I think, consider the advantages or otherwise of Exhibitions. Is the advantage, if any, on the side of the Exhibition, the Society, or the public? For my part, I think that all three share about equally in its advantages? Take the Exhibition. As I belong to this class, I can only say that the benefit I have derived from exhibiting at our own and other Exhibitions is incalculable. When I joined this Society at its foundation, I was a photographer of about twelve months' standing and with a pretty good idea of my own works. At our first exhibition I gaily sent in my quarter-plates, and had some faint hopes of receiving distinction. Gentlemen, my first visit to that room did me more good photographically than years of study. When I saw my poor efforts hanging by the side of the works of such members as we had then, England, Colls, Hodges, Blackmore, and others, I do not blush to say that I was ashamed to be seen near my own frames. Well, should there be any beginners here to-night, who should ever suffer the same feeling, I would beg of them not to go away faint-hearted. Take this lesson as it should be taken, as an impetus to better things in the future. I know that I left that Exhibition fully resolved that at the following one I would show something better or die in the attempt. I had a twelvemonth in which to work, and, when that period was gone, I think I may say without vanity that, though still far from, I was much nearer, the goal. That goal I take to be perfection, and, though there are such multitudes striving for it, how few, if any, attain it. But still that lesson I received I have never and hope I never shall, forget and I always make a point of sending in to our own Exhibition and sometimes even venture outside, as I feel that the benefit to be derived from a little competition in one's photographic as well as in one's daily life is most helpful. It keeps one from having too high an opinion of one's own work, and also gives one a healthy stimulus to better things. So much for the benefit to the Exhibitor.

To the Society the advantage is in the attraction it has for the members generally, who can all enter into a healthy competition among themselves, and who have in this one meeting of the year the means of finding out the best workers among themselves, and can here always bring their friends with them to enjoy their triumph or sympathise in their failure. And the advantage is also much the same to the Society generally, as to each individual member, in the competing with other societies, as one feels proud of belonging to a Society that is considered tip top in its work, and has perchance carried off the challenge cup at a Society competition.

To the public it is their only means of knowing what progress is being made in the science and the art of photography. If it was not for the Royal Society's Exhibition, the general public would have had not the slightest opportunity of knowing what we are doing and how we are progressing; and, if they did not know that, what *inducement* to take up its study would be lost. I should imagine that a visit to the Royal Society's yearly show—and perhaps to our own, too, to a smaller extent—has been the means of recruiting many a member to our ranks. I would therefore earnestly beg of you all to contribute freely to our next Exhibition, not only for your own benefit, but also for our advancement.

And, having shown you the advantage that accrues to the Society from our belonging to it, perhaps you will not think it presumption on my

part if I give you my opinions of the manner in which the Society could add to our education. In the first place, as regards the indoor meetings. We have evenings for papers, and technical evenings for social, and what I may call elementary lectures and demonstrations. Now, it seems to me that, in the past, the Council have not paid the attention to the drawing up of the syllabus that so important a proceeding deserves. It should be remembered that in drawing it up the greatest attention should be paid to the wants and wishes of the majority, but that, at the same time, the minority must not be altogether disregarded. They must remember that, in an audience consisting of amateurs and professionals, technical and pictorial workers, and followers of the hand camera and lantern, some attention must be paid to all, and it should be the duty of some appointed member to find out the numbers of the different workers. We should then be in a position to find out what sort of papers or demonstrations were required, and not be under the necessity of accepting any that are offered. As I do not wish, in giving an example, to hurt the feelings of the gentlemen who have so kindly given us such interesting papers in the past, I cannot do better than quote myself as an instance, as, whatever I say about myself, I cannot very well give it as an excuse for resigning my membership. Well, why am I taking up your valuable time this evening by reading a paper before you? Many of you here to-night can do better work than I can, and all of you as good, and I dare say would be able to give a much better list of photographic jottings than I have placed before you; and yet I am the lecturer and you are the listeners, simply because there was a vacant date to be filled, and the Secretary was bound to fill it somehow, and appealed to me. As I had nothing new to demonstrate, and no new photographic feature to lecture on, I am constrained to fall back on a general review, which would, perhaps, more become a presidential address than a photographic lecture.

(*To be continued.*) LESLIE SELBY.

THE PHOTOGRAPHIC EXHIBITION AT THE IMPERIAL INSTITUTE.

THE "Exhibition of Photography in its application to the arts, sciences and industries throughout the Empire," now being held at the Imperia Institute, South Kensington, may be said to have assumed the mos favourable appearance and *ensemble* it is likely to present while it is open and we therefore, in redemption of our last week's promise, proceed to refer in some detail to the exhibits which constitute the display.

Excellent though the collection is in several minor respects, it is impossible for us, after a second visit, to avoid expressing the opinion that a great opportunity has been lost or muddled away, and that the Exhibition barely does justice to any one single department of photography. The promise held out by the original prospectus has not been fulfilled to anything like a fair degree, and the result of it all is that there is an air and appearance of "scratchiness" and perfunctoriness about the Exhibition which, while it may not elicit surprise or even notice from the public at large, is bound to have a depressing effect on photographers. It is no exaggeration to say that, if the Exhibition had "panned out" as much as it was capable, under proper management, of doing, not three only of the Institute galleries, but the entire suite of rooms in the large building would have been required for the exhibits.

The minute classification and subdivision of sections adopted by the organizers of the Exhibition may conveniently be disregarded, the Exhibition, as it were, naturally grouping itself into three divisions—the Artistic, the Educational and General, and the Historical, and under these heads we propose classifying our notes. Each division finds a place in a separate gallery. There are three galleries, each exceedingly remote from the other—a delightful arrangement if one is in need of walking exercise.

THE ARTISTIC DIVISION.

The loan collection of artistic photography is located in a large well-lighted upper gallery. About two hundred photographs are hung with great taste and effect, and the result is very pleasing. As giving our readers the opportunity both of forming some idea what the collection is like, and of how far it is to be regarded as what it is claimed to be, that is, "thoroughly representative of all schools," we will enumerate a few of the many well-known works that are hung. Mr. Ralph Robinson shows, among other works, *A Primrose by the River's Brim; Foggy Thames;* Mrs. S. Francis Clarke, *Sympathy; After Mass; Aha!* Mr. Arthur Burchett, *The Knight;* Mr. J. B. B. Wellington, *A Still Delight Steals o'er the Earth;* and *Eventide;* Mr. Gambier Bolton, several animal studies; Colonel Gale, *Autumn—Early Morning* and others; Mr. B. G. Wilkinson, *Sand Dunes;* Mr. Lionel Bennett, *The First Gleam;* Mr. J. Craig Annan, *At Utrecht;* Mr. H. P. Robinson, *Carolling; Dawn and Sunset; Storm Clearing Off;* Mrs. Carine Cadby, *A Poppy Study;* Mr. W. A. Cadby, *A Naiad;* Mr. Sutcliffe, *Water Rats;* Mr. Henry Stevens, flower and animal studies; Mr. H. H. Hay Cameron, portraits. There are also shown *Two Ways of Life*, and other examples, by the late O. G. Rejlander, and portraits by the late Mrs. Cameron. Mr. Shapoor Bhedwar shows *Feast of Roses;* Messrs. Karl Greger and T. M. Brownrigg also exhibit; Mr. A. Horsley Hinton shows *In the Thames Estuary; Reed Harvesting; Benfleet Ford;* Mr. George Davison is represented by *The Waveney River;* Mr. Rowland Briant by *A Swamp;* and among the other exhibitors are Mr. Gear, Mr. Seyton Scott, Mr. L. Sawyer, Mr. Lintott, Rev. F. C. Lambert, Mr. Calland, Mr. Dresser, and Mr. W. Thomas.

THE HISTORICAL DIVISION.

The remoteness of the gallery in which the historical specimens are shown, will probably be responsible for a comparative neglect of the few objects of historical interest got together. In this room we find hung several enlargements of negatives of animals photographed in the Zoological Gardens, by Mr. Haes, between the years 1864–73; some interesting old Daguerreotypes, shown by Mr. W. England; calotype negatives and prints, unfaded after thirty-eight years, shown by Mr. R. G. Sillar; enamels (made 1872–3) by Mr. W. Mayland; Talbotypes taken by the late B. B. Turner, from 1850 to 1855; examples of the photogravure work of Pretsch; early pantascopic views, &c., &c.

A number of hand cameras are also shown as illustrative of the development of the hand camera, but the series is far from complete.

The hand camera used by Mr. Bolas in 1880 is here, and should attract attention. It is "arranged for focussing, the body of the camera being formed of two brass tubes with rack and pinion. The shutter works between the lenses, with pneumatic release, and the camera carries three slides." Relics of the Daguerreotype era and many documents of historical interest are placed in the room, which shelters a number of Alpine photographs.

Mr. Traill Taylor sends a collection of ancient and modern lenses and apparatus, including:—

A triple Derogy Lens, with bayonet joints; Goddard's rectilinear landscape lens, A.D. 1860; Dallmeyer's rectilinear landscape lens, modern; Sutton's cylindrical water lens; Voigtlander's landscape lens; Wray's casket lens; early rapid baby portrait lens; full figure American 10 × 8 portrait lens; wide-angle American rectilinear lens; r. rectilinear lens —Morrison's formula; pantoscopic clockwork camera; Nicol prism, used thirty years since, with lens; opera-glass camera (holds fifty plates) A.D. 1868; collection of early ceramic portraits, by Lafon de Camarsac; Daguerreotype from the Great Exhibition of 1851; and a telephoto lens, made A.D. 1875, lent by A. E. Staley & Co.

THE EDUCATIONAL AND GENERAL EXHIBITS.

The visitor will probably prefer to take the exhibits in the long corridor gallery, which is pleasantly supposed to be broken up into a number of rooms, in the order in which they find place, and in that case, supposing him first of all to have inspected the Artistic Division, he will see them arranged in something like the following order, which, however, should be inverted if he approaches the gallery from the Historical Division.

Mr. H. Vanderweyde has a number of examples illustrative of the correcting powers of his photographic corrector, and many charming portraits; and Mr. F. W. Hart, results of his method of utilising the flashlight, of which an installation finds a place.

The exhibit of Messrs. Penrose & Co. is of real interest and excellence. It epitomises, so to speak, the requirements of the photo-engraver, and consists of a large and handsome structure, giving place to copying cameras, electric installation for copying, routing machines, ruled screens, engravers' tools, collotype press (Voirin's), and other implements dear to the heart (and necessary to the success) of the process worker.

The Meisenbach Company and the Swan Electric Engraving Company show specimens of work illustrative of the powers of their respective processes.

Messrs. Airs & Co. have a little display of "Bessus" film and plate-holders, jet-centerers, lanterns, &c.

Especial praise is due to Mr. Fred Hollyer, who has a section all to himself, in which, by the aid of many examples, he demonstrates his skill in the artistic reproduction of pictures, and also shows many original portraits in his clever method of treatment. Mr. Martin Jacolette shows pleasing and refined specimens of portraiture, and an instructing lantern exhibit will be found under the well-known name of J. H. Steward.

The latest novelties in camera stands, developing trays, and dark slides are shown by Messrs. B. J. Edwards & Co., who also demonstrate, by means of numerous fine examples, the practical value of orthochromatic plates. Messrs. Hannam & Co. have a capital and varied display of photographic mounts; and Messrs. Morley & Cooper an excellent stand of serviceable and good photographic apparatus.

Messrs. Sprague send specimens of their well-known and long-popular "ink-photo" process. But possibly the greatest interest will chiefly centre in the installation of Messrs. Waterlow & Sons who, besides placing on view innumerable examples of the perfect skill with which they work collotype, Woodburytype, half-tone, &c., also give practical demonstrations of the first two mentioned processes.

The Polytechnic School are also demonstrating the preparation of blocks for half-tone printing. The proprietors of *Black and White* and the *Graphic* send many specimens objectively descriptive of the way in which the engravings appearing in those journals are prepared. Three-colour printing is also illustrated by a variety of specimens.

An unquestioned feature of the Exhibition are the very fine entries in the Photo-ceramic Section. Messrs. Fletcher show furnaces, Mr. J. W.

Moore plaques and tiles, Mr. J. P. Emery colours and chemicals; and charming specimens of enamel plaques emanate from Messrs. Tunny & Co., Willis & Co., Morgan & Kidd, Midland Photo-keramic Company (in china), G. Pendry, J. S. Teape, A. Haddon, W. T. Watson, and others, both the dusting on and substitution processes having their respective properties and capabilities well illustrated by these beautiful specimens. The Princess of Wales lends a collection of tea service, pieces, &c., on to which her photographs have been transferred. The Photo-ceramic Section is one of the few successes of the Exhibition, and deserves to be studied by photographers. Numerous exhibits showing the stages of the various line and half-tone processes of photo-engraving will be found in the section.

The remaining sections, which are of high scientific interest, include photographs of spectra by Professor W. N. Hartley; examples of his stellar work, by Dr. Common; a series of photographs of the scenes of explosive outrages, lent by the Home Office; photographs of a splashing drop, flying bullets, &c., and astro and solar photographs from Oxford, Greenwich, &c., and cloud work by Mr. Clayden. The Photo-micrographic Section, organized by Mr. Pringle, is singularly well filled, and embraces a wide and interesting variety of examples by T. F. Smith, F. Iles, Comber, E. C. Bousfield, and other celebrated workers in this fascinating field.

The Ordnance Survey show negatives, plates, and proofs of scaled reproductions; the Royal Society send Higgs' photographs of the spectrum and negatives of the sun; and the Kew Observatory, the Royal Astronomical Society, and other bodies contribute to the section examples of the uses to which photography is reduced in the work of scientific observation. The more scientific departments of the Exhibition are, indeed, creditably well supported.

WEST LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

"How are the mighty fallen," we murmured to ourselves when inspecting the sixth annual Exhibition of photographs held last week by the above Society at the Chiswick School of Art. The Society has put back the hands of time with a vengeance, the Exhibition just held being far below the standard the West London set itself in former years. Among the 150 photographs placed on view, it is undeniable that there was much that was fairly good, both artistically and technically, but it was also apparent that the commonplace predominated, and that scarcely a single effort exhibited any marked merit.

The Judges (Mr. Cembrano and Mr. Collier) made five awards:—A silver medal to Mr. Leslie Selby for *Harlech*, a view with a well-broken foreground, castellated heights in the middle distance, and hills beyond—a well-chosen but sombrely rendered picture; and two bronzes to Mr. G. Lamley for a nicely photographed interior—*Lavatory, Gloucester*, and a pretty little river bit, with hills in the distance forming an effective study. Bronze medals were also awarded for lantern slides to Messrs. H. and L. Selby. For the rest, a good word is deserved by Mr. G. F. Blackmore for, among other contributions, a little study, *Home from Boulogne*, showing the steamship *La Marguerite* ploughing her way over the darkening waters, which would have been perfect if more vigorous in contrast; to Mr. Leslie Selby, who contributed by far the best work, notably *Evening Grey*, a soft grey-toned rendering of a river view; and to Mr. J. Wilson for a really excellent little interior, *The Library, Holland House*. But we missed the masterly work of John Hodges, Lionel Bennett, W. L. Colls, and others, who aforetime made the West London Exhibition so pictorially good and interesting.

We quote the following from the Judges' report:—"The Judges compliment the members of the Society on the very high standard of work in the Exhibition, as in their opinion no other similar Society could bring together such an excellent collection of photographs." Candour compels us, in the interests of the West London Society, to remark that the Judges were far too complimentary. We shall expect the Society to do very much better next year.

Our Editorial Table.

Guequier's Belgian Dry Plates.

Every one cordially admits that, whatever else they may make in Belgium, they certainly can and do make dry plates there of great excellence. Ghent, in particular, has long had clustered around it associations in this connexion since the time of Dr. Monckhoven. We have put to a variety of tests some samples of the production of Messrs. V. Guequier & Co., Ghent, which enjoy a high reputation on the Continent, and have found that they quite bear out all that the manufacturers claim for them, namely, that they are "clean, extra rapid, reliable, and fit for all work."

Instead of having to send to Belgium for these plates, we are pleased to find that they are now kept in stock, and supplied wholesale and retail by Messrs. Perken, Son, & Rayment, 99, Hatton-garden, London, E.C., who have been appointed sole agents for the United Kingdom for their sale, and who will send lists of sizes and prices on application.

News and Notes.

Royal Photographic Society.—Technical Meeting, May 28, at 50, Great Russell-street, at 8 p.m. *Polychromatic Carbon Printing*, with a demonstration, by Mr. Birt Acres.

We have received *Wheeler's No. 2 Label Book*, which consists of exposure labels for dark slides. Each is gummed, ready for tearing out and attaching to the slide. It will be appreciated by many.

On Wednesday, June 5, Mr. Frank Howard, of Wallingford, will deliver an address at the South London Photographic Society, Hanover Hall, Hanover-park, Peckham, S.E., on the early work of the old South London Photographic Society, illustrated by specimens of work. Members of the old Society and all other persons interested in the subject are most cordially invited to be present. The meeting place is about three minutes' walk from Peckham-rye Station (L.B. & S.C.R. and L.C. & D.R.), and the proceedings commence at eight o'clock.

North Middlesex Photographic Society's Lending Library.—Mr. F. W. Cox writes: "I am pleased to inform you that, at a Council Meeting held on the 10th inst., it was resolved to form a Lending Library for the use of members of this Society, and I have, for the present, consented to act as its Hon. Librarian. The same evening several voluntary promises were made to contribute volumes for the purpose in question. My object now—and with consent of Council—is to make a special appeal to members who have not already promised for gifts of books, pamphlets, newspapers, &c. (new or second-hand, and bound, if possible), dealing with the art or science of photography, or likely to be of aid to photographers. To show that the selection can be of wide and useful range, I find, on reference to the library catalogue of a London photographic society, the inclusion of treatises on art, spectroscope; maps of London and environs, home and other counties; guide books, copies of Acts of Parliament relating to copyright law, &c. As the wish for a library has been generally expressed by members, I ask your hearty support in this matter, and shall be glad if intending contributors will kindly forward parcels to me either at 'Jubilee House,' Hornsey Rise, or to my private address, 34, Palace-road, Crouch End, carriage paid. All presentations will be announced, and rules arranged for the management of the library in due course."

Photographic Society for Monmouth and Neighbourhood.—Amateur photographers would be pleased to learn that, through the initiative of Col. Walwyn, a Photographic Society has been established for Monmouth and the surrounding locality. The need for such a society is constantly felt, and local amateurs will feel indebted to Col. Walwyn for the trouble and pains he has taken to meet their wishes in this direction. A meeting of photographers, which he had convened by post-card, met on the stage at the Rolls Hall on Thursday afternoon, when Col. Walwyn (who was voted to the chair) was supported by the following: Miss Bagnall-Oakeley, Miss C. Williams (Rockfield), Miss Tyler Taylor, the Rev. — Clark (Ross), Col. Vaughan, Mr. Bathurst, Mr. Curwen (Coleford), Mr. T. R. Hyam, Mr. Tudor Williams (professional), Mr. W. Evans, Mr. C. Cranch, Mr. Tyler Taylor, &c. Col. Walwyn observed that some of them had thought that a photographic society for the neighbourhood would be a pleasant and useful thing. The Chairman submitted a number of communications which he had received from the secretaries of societies—Hereford, Bristol, &c.—and programmes of proceedings upon the usual lines were inspected. Mr. Tudor Williams suggested 10*s.* as the subscription. Mr. Hyam, however, preferred to set the figure at 5*s.*, in which he was supported by Col. Walwyn and some other. The Chairman presented a list of about twenty names, representing promises to join the Society, and proposed the appointment of Lord Llangattock—who was at one time an ardent photographer, holding the Amateur Photographic Association's certificate of honourable mention, and who had expressed his readiness to help the Society—as President. This was seconded by Col. Vaughan, and carried unanimously. Col. Walwyn was asked, and promptly agreed, to serve in the joint capacity of Vice-President and Hon. Secretary. This was moved by Mr. Bathurst and seconded by Mr. Williams. The Chairman moved the appointment of the following to form a Council, which Mr. Curwen seconded:—The President, Vice-President, Miss Bagnall-Oakeley, Col. Vaughan, Mr. Bathurst, and Mr. T. R. Hyam, with power to add to their number. The Chairman handed the various codes of rules to the Council, to draw up rules for the new Society, and observed that the idea of circulating portfolios of work, to be adjudicated upon at the end of the year, was, he thought, a good one. They might make it a rule to arrange field days on the requisition of, say, eight or ten members, to be conducted, added Colonel Walwyn, by Mr. Tudor Williams. Mr. Williams expressed his readiness to help them. Colonel Walwyn offered the billiard-room at Croft-y-Bwla, to which is attached a dark room, for meetings of the Society, if it was likely to be convenient. Colonel Vaughan: And then, when we have spoilt a negative, Mr. Williams will be able to go and put it right. Colonel Walmyn: Or when we have got two images on one plate. In discussing the amount of the subscription, Mr. Williams suggested that the boys from the Grammar School who worked cameras should be admitted half price. Miss Bagnall-Oakeley (apprehensively): Would it be desirable to admit a lot of boys at half-a-crown? I would sooner charge them double! Colonel Vaughan concurred. He objected to boys eating buns in the dark room. The subscription was fixed at 5*s.* The Society having been labelled "The Wye Photographic Society," on Colonel Vaughan's motion, the meeting terminated, with the usual vote of thanks.—*Monmouthshire Beacon.*

Mr. Wilfred Emery, of 24 South-street, Baker-street, W., writes: "Owing to the rapid and continued increase in my business, I have been compelled to open larger and more convenient premises in the suburbs, in addition to my West-end office. My addresses now are: 24, South-street, Baker-street, W., and at 8, Dyne-road, Brondesbury, N.W.

A Photographic Club has been formed in connexion with the Literary and Philosophical Society, Newcastle. The following are the officers:—*President:* Mr. J. W. Swan, M.A., F.R.S.—*Vice-President:* Mr. W. E. Cowan.—*Committee:* Messrs. J. L. Bidgood, E. E. Brown, F. W. Pittuck, J. Hume, D. Summerfield, J. Wilson.—*Hon. Secretary and Treasurer:* Mr. J. A. G. Ross.

One of the gentlest, kindliest, and most obliging gentlemen I have ever known has been taken away from us this week. I allude to Mr. William Wilson, managing partner of the photographic firm of A. & G. Taylor, St. Nicholas' Buildings, Newcastle. Mr. Wilson, together with his good and amiable wife, took an abiding interest in the work of Uncle Toby, subscribed handsomely to his Toy Fund, and otherwise rendered earnest and loving service to the children's movement. Every year since Uncle Toby's annual exhibition of toys was commenced, Mr. Wilson's firm deemed it no less a pleasure than an honour to be allowed to take a series of photographic views of the succeeding callections. Nor was this the only valuable service which our estimable friend performed. When it was proposed to hold that great and unique gathering of contributors, which took place place in May, 1891, Mr. Wilson entered heartily into the scheme of producing a photographic group of the ladies and gentlemen who are associated with the *Weekly Chronicle* in all parts of the country. The result was the now historic collection of portraits of 236 contributors, which adorns hundreds of homes in widely separated parts of England and Scotland. Apart from all this, however, Mr. Wilson was no ordinary man. So just and genial was he in all the relations of life that he was dearly beloved by all who were acquainted with him, especially by the workpeople and others who had the happiness of serving under his superintendence. As an old servant of the firm, who brought me the sorrowful news of his death, said to me then, "We have not lost an employer; we have lost a father."—*Newcastle Chronicle.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

May.	Name of Society.	Subject.
27	Camera Club	
27	North Middlesex	*Portraiture: Lighting and Posing.* W. E. Debenham.
27	Richmond	
28	Birmingham Photo. Society	*The Photographic Survey of Warwickshire.* J. H. Pickard.
28	Hackney	
28	Halifax Camera Club	
28	Lancaster	
28	Leith	
28	Oldham	Exc.: Ashbury for Belle Vue Gardens. Leader, Tom Heywood.
28	Paisley	
28	Royal Photographic Society	*Polychromatic Carbon Printing.* Birt Acres.
28	Warrington	
29	Bath	
29	Burnley	
29	Croydon Camera Club	Exc.: Horsham, for Nuthurst and Sedgwick Castle. Leader, E. A. Woodcock.
29	Leytonstone	
29	Newton Heath	*Lantern-slide Making.* J. Fortune.
29	Photographic Club	*The Far East.* R. P. Drage.
29	Southport	*C.C. Paper.* George Cross.
30	Camera Club	
30	Glossop Dale	
30	Halifax Photo. Club	
30	Hull	
30	Liverpool Amateur	
30	London and Provincial	Open Evening.
30	Oldham	
31	Cardiff	
31	Croydon Microscopical	Conversational Meeting.
31	Holborn	
31–June 4	Liverpool Amateur	Excursion: Newcastle (co. Down) and the Mourne Mountains, *viâ* Belfast. Leader, Mr. Carruthers.
31	Maidstone	
31	Swansea	
June.		
1	Hull	
1	Newton Heath	Excursion: Rostherne Mere. Leader, J. Moodie.

ROYAL PHOTOGRAPHIC SOCIETY.

May 21,—Photo-mechanical Meeting,—Mr. Horace Wilmer in the chair.

Mr. W. Gamble read a paper on *Apparatus for Process Photography*, in the course of which he described and dealt with the essential disposition and arrangement of the camera, ruled screen, lens, mirror, or prism employed in taking the negative. The latter part of the paper was concerned with an exhaustive consideration of the influence of the lens aperture in determining the shape of the dot. Mr. Gamble next showed on the screen various half-tone wet and dry-plate negatives, pointing out their characteristics and qualities, and laying stress on the effect produced by the proper selection of the size and shape of the aperture. Enlargements from portions of these negatives were also projected, by which members were able to observe the different effects imparted to the negatives by variations in the sizes, shapes, and qualities of the dots. Among his exhibits Mr. Gamble showed a 200-line cross-ruled screen, and also said that Levy was producing a screen with four rulings, specimen negatives so produced being also shown. An experimental mechanically ruled screen, made with the object of imparting an irregular grain to a photogravure plate, was illustrated.

A short discussion followed, and Mr. Gamble received a vote of thanks.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 16,—Mr. A. Mackie in the chair.

Mr. J. Traill Taylor addressed the members on the subject of *Panoramic Photography*, in the course of which he described and commented upon most of the various cameras and appliances employed in the production of panoramas.

A conversational discussion ensued.

PHOTOGRAPHIC CLUB.

May 15,—Mr. Naegeli in the chair.

Photography and Cycling.

Mr. W. D. Welford gave a paper upon *Photography and Cycling.* He drew comparisons from the time of the boneshaker and wet plates to that of the ordinary bicycle and dry plates, and then to that of the present-day safety and rapid plates. He commenced his operations in 1874, and at that time, after many difficulties had presented themselves, succeeded in devising an outfit for working wet plates. He added great point to his paper by showing photographs dating from 1874 of himself and machines of various patterns with his kit attached. He also mentioned some well-known men in the photographic world who had allied themselves with cycling, notably Mr. Thomas Bedding (who wrote for his paper, *Cycling*, in 1880) and Mr. Sturmey, the Editor of *Photography*, and who had been in his time the winner of many contests on the cycle. He detailed the various parts of the machine upon which he had carried his kits. His opinion was that the handle bar was the proper place. He exhibited the handle bar of his machine with clips attached, showing that the kit, when contained in its case, was simply placed in position by slipping the lugs on to the clips on either side. The weight of kit was thus thrown down on the handle bar.

Mr. Drage asked if Mr. Welford had found any difficulty with plate magazine cameras with regard to dust, &c.

Mr. Welford, if using such, would bend the sheaths, or pack up each sheath with paper or card to prevent rattling.

Mr. Bridge gave one or two of his experiences as a photographic cyclist. The use of a cycle was an advantage if one wanted to make a short trip, say, to a place one was unacquainted with, and trains did not fit in. It was awkward at times to be told that it was five or six miles and a bit to the proposed destination. It was then one felt the advantage of being on a machine.

A vote of thanks was passed to Mr. Welford for his address.

Hackney Photographic Society.—The Annual General Meeting was held on May 7.—The reports for the past year's work, rendered by the Hon. Secretary and Treasurer, were eminently satisfactory, and showed that the Society was still in the van of progress. The result of the election of the new Executive was as follows:—*President:* Mr. E. J. Wall.—*Council:* Messrs. Roland Smith, R. Beckett, F. W. Gosling, A. Barker, W. L. Barker, E. Puttock, L. S. Wilks, and F. Houghton.—*Lanternist:* Mr. A. Rose.—*Excursion Secretary and Librarian:* Mr. A. Dean.—*Treasurer:* Mr. J. O. Grant.—*Hon. Secretary:* Mr. W. F. Fenton-Jones.—*Assistant Secretary:* Mr. A. D. Fort.

Sheffield Photographic Society.—The ordinary Monthly Meeting was held in the Society's room on the 7th inst., when the President (Mr. Firth) occupied the chair. The ordinary business was transacted, and two new members elected. The Judges appointed for the bi-monthly Competition awarded the prize to Mr. J. W. Raynor for a very fine bromide print of Dovedale. Mr. G. W. Blackwell gave a practical demonstration on the *Presto and Otto Papers.* Specimens supplied by the maker were on view, and samples of paper distributed among the members.

FORTHCOMING EXHIBITION.

1895.
June 29–July 6 ..... *Agricultural Hall. W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 9437.—"Improvements in Photographic or Heliographic Copying Apparatus." Complete Specifications. H. Sack.—*Dated May*, 1895.

No. 9438.—"Improved Printing Silver Nitrate Paper for Photographic

Purposes, and Process of Preparing Same." F. HRDLICZKA-CSISZAR.—*Dated May*, 1895.

No. 9496.—"Improvements in Flashlight Mechanism for Photographic Apparatus." Complete Specification. M. W. NEWCOMB.—*Dated May*, 1895.

No. 9521.—"A Photographic Telegraph Recorder (Ader's system)." Communicated by La Société Industrielle des Telephones and C. Ader, France. J. IMRAY.—*Dated May*, 1895.

No. 9697.—"Improvements in the Construction of Photographic Camera Stand or Tripod Points." W. E. LYON.—*Dated May*, 1895.

No. 9807.—"Improvements in Photographic Cameras." M. A. WEIR.—*Dated May*, 1895.

No. 9842.—"Improvements in Waterproof Cements Applicable in Connexion with Photography and for Other Purposes." T. THOMSON.—*Dated May*, 1895.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

LOSS OF INTENSITY.

To the EDITOR.

SIR,—I notice a communication from "F. J. Q." in your last issue, in which he expresses a wish to know the reason of prints fading in the toning and fixing baths.

There are few photographers who have not experienced the same thing sometimes during their practice, so no one will dispute that it takes place, although it is not always easy to put one's finger on the cause, which may be one or more. I believe that two reasons will cover nearly all the cases that occur. One is, the improper condition of the toning and fixing baths, either in temperature or composition, and the other the too short exposure to the light.

With regard to the baths, they may be too strong or improperly compounded, and, as far as the toning bath is concerned, not sufficiently ripened, or they may be used too warm. Where large numbers of prints are made, uniformity in strength and temperature is strictly looked after. Another cause, and the one by far most likely to occur is the *kind* of negative used; prints from a thin veiled negative are much more prone to reduction than any other, because, to obtain a passable print, they cannot be exposed to the light for a sufficient length of time to effect a proper reduction of the silver or the formation of the organic colouring matter.

All *good* negatives make better prints in diffused light than in sunshine, and reduce less in the baths.

Prints from thin poor negatives invariably fade out in toning and fixing, no matter how deeply they are printed. A very dense negative is the only kind that will stand sun printing with impunity. My experience has largely been with negatives for publication, and fading has invariably been found owing to something wrong with the baths, either in temperature or strength, as the quality of the negatives was tolerably uniform; but, it was always found that the thinner, flatter negatives were much the greatest sufferers by any oversights of the kind.

A batch of printing done in the sunshine, taking one negative with another, was invariably more uneven than a batch done in diffused light, and reduced much more in toning and fixing, the reduction taking place chiefly in the hyposulphite bath.

In the present day thousands of thin veiled negatives are produced that require immense care to get even a passable print from, to say nothing of a first-class one, the least improper state of the baths almost certainly producing a poor, faded, washed-out-looking result, even if the prints are printed almost to obliteration. It may be borne in mind that the longer a negative takes to print, providing the shadows are fairly clear, the less likely it is to be affected by the baths not being precisely in the best condition, whereas the thinner and veiled ones become flat and weak the least thing being out of order.—I am, yours, &c.,

EDWARD DUNMORE.

PLATES *VERSUS* FILMS.

To the EDITOR.

SIR,—I have just now been enabled to make a trial of some importance, so far as the question of plates *versus* films is concerned, and send you the data. Last year (I am sorry not to have recorded the date) I received from Dr. Smith, of Zurich, some of his red-label plates with films coated with the same lot of emulsion. I tried very carefully the plates against the films, and found that there was no perceptible difference either in intensity or sensitiveness. In fact, the emulsion behaved normally, as if the vehicle had no influence on it. I have now tried the effect of keeping on the remainder of the sample, under the same conditions and with the same precision, and I find that the films have not lost any sensitiveness, but that they seem, on the contrary, at first to have gained some, as they come up more rapidly under the developer, both being developed in the same tray; but the apparent gain was really due to a slight fog, which set in as the deep shadows began to come out, and compelled me to withdraw the films from the developer, while the plates went on to the complete development without fog, and the absolute sensitiveness seemed to be about the same. The red-label plates are not so sensitive as the green of the same maker, and he has promised me some plates and films of the latter brand for further similar trials, which I expect to prove that, while the emulsions coated on well-seasoned celluloid lose nothing in sensitiveness at first, they lose stability by keeping in direct proportion to their sensitiveness.—I am, yours, &c., W. J. STILLMAN.

Rome, May 14, 1895.

PHOTOGRAPHIC COPYRIGHT.

To the EDITOR.

SIR,—As one somewhat interested in the principle laid down by the Photographers' Copyright Union, I cannot help sharing in the legitimate satisfaction expressed at the success of Mr. Gambier Bolton's action.

His letter is also very interesting, especially that clause relating to the enrolment of amateurs as members of the Union.

I do hope that the Union will see their way to concede this important point, for, after all, the Union being constituted for the protection of photographers' rights, there can be no question of desiring to join in discussing matters of a purely professional character.

Personally, I feel that the Union made a great mistake in fixing the subscription at 10*s.* 6*d.*, thus excluding very many photographers, to whom such a sum is a consideration, especially when there is no immediate prospect of benefit following. Besides, what is wanted is the support and sympathy of all photographers, for, when one reads of the liberal manner in which the general expenses were met and also the splendid response made to the guarantee fund, it is apparent that adhesion to the Union is of a far greater value than a few subscriptions of 10*s.* 6*d.* Why not fix it at 2*s.* 6*d.*, for that sum would be quite sufficient to cover postage, &c., leaving it to the "associates" to increase the amount as time advances, and when they have been benefited by their membership of the Union? Thanking you in advance,—I am, yours, &c., AN EX-PROFESSIONAL.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—The *Photogram* of this month contains a passionately sympathetic appeal on behalf of this charity. Its funds are all spent, professional photographers, masters and men, all are apathetic, and "the personal neglect of the Association is even greater than the financial."

The surviving interest in the Association appears confined almost to the editors of the *Photogram* and Mr. W. T. Wilkinson. This gentleman, one of the original founders, has continued throughout its career, an active member of the committee. Quite recently he invited assistants to meet him at a rendezvous in the City to discuss the situation, but not *one* responded to his appeal!

Common sense dictates the decent burial of the dead Association.

Only this remains to be said: If masters and men heartily combined to resuscitate the moribund charity, manufacturers and dealers would, I feel sure, handsomely contribute to the funds—not otherwise.—I am, sir, yours, &c., W. S. BIRD.

EXHIBITION AT THE ROYAL AQUARIUM.

To the EDITOR.

SIR,—May I ask if you can do us the favour of announcing that an Exhibition of matters connected with photography, at which sales will be permitted, will be held at the Aquarium in June next? The charge for space will be at the rate of 1*s.* per square foot, this amount being returned to exhibitors in the shape of tickets. Medals and diplomas will be given in the trade section. Competitions for amateurs and professionals, for which medals and diplomas will also be given, will be held in connexion with the Exhibition. In these no entry fees will be charged to members of recognised photographic societies.—I am, yours, &c.,

E. A. DU PLAT.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, whole-plate outfit. Exchange Italian mandoline and case, new.—Address, L. STACK, Bradford House, Malvern.

Will exchange 16×16 bellows camera, with mirror box complete, or circular saw on iron standard for zinco work, for half-plate modern outdoor outfit, three double slides.—Address, E. A. CARNELL, Photographer, New Radford, Nottingham.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

J. E.—1. We fear there is no remedy. 2. About the same rapidity.

LENS.—We do not answer questions such as yours. All the lenses named are good.

INOPS CONSILII.—We shall be glad to report upon the powder if you send us a sample.

W. PARRY.—*Collotype*, by Dr. Schnauss (translated by E. C. Middleton), is, we think, likely to suit you.

"VIEW."—Messrs. Marion & Co., Soho-square; Messrs. Gordon & Co., 34, High-street, Putney, undertake such work.

A. A. R.—The piece of paper sent was certainly sensitised on far too weak a bath. That is the source of all the trouble you have encountered.

TRIPOD.—If the roof of the studio is carried up to a good height, it will do. The amount of the glazed portion will depend upon the slope, and more particularly upon its aspect, which is not given.

JOSEPH SMITH.—It is the original, not the enlargement, that has to be sent for copyright purposes. Send one print unmounted, and also you had better send a second one mounted. Our publishers will effect copyright for you.

G. N. FUTCHER.—1. Collodion transparencies may be toned in a variety of ways; the chlorides of gold, platinum, or mercury, or the alkaline sulphides will all darken the tone. 2. Your experience is altogether contrary to that of others. Try again, or write, giving details.

POET.—You, being the author of the photograph, have a copyright in it, which you should have registered at the time it was taken. Your paying a royalty to the local authorities, on the copies you sell, for the privilege of photographing the piece of statuary, will not, so far as we can see, invalidate the copyright.

EMULSION.—Prominence was given at the time to the increased sensitiveness claimed to be obtained in collodion emulsion, but we have heard nothing of the matter since. No details of the method were published, and the plates have not been put upon the market as yet, and we have no knowledge whether they will or not.

WM. BULLOCH.—Before we can pronounce upon the subject it will be necessary that we know definitely what has been claimed in the previous patent, and also what are the improvements or modifications on it which you have made. It might be well if you were to send yours for examination. It could be returned on the second day.

B. PAGE.—From the symptoms described, and the small use you have made of the salt, we should say that the rash is not in any way due to bichromate poisoning, more especially as it is on various parts of the body and not at all on the hands. It is on the hands, so far as previous experience shows, that it first makes its appearance.

S. E. WOOLSTON.—The Photographic Exhibition at the Imperial Institute is already open, hence you are too late in applying for space. However, as the show is not so large or comprehensive as its promoters desired it to be, it is possible they would still accept what you would like to exhibit. Write and inquire; it will only cost you a penny stamp.

S. R. H.—The stain looks something like imperfect fixation, as you suggest, but we should not like to commit ourselves by saying that is the cause without knowing more particulars. If it were the cause, one would expect the stain to have been seen before the print was mounted, and, consequently, it would have been rejected at the time instead of being mounted.

A. CLARKE.—Your five queries involve several knotty points in copyright law, and as decisions upon them at different times have not all been in unison, we think it would be better for you to obtain the opinion of a solicitor or counsel, well versed in copyright law, upon them. To do what you suggest, according to the ruling in a case decided some years ago, would certainly land you in trouble. However, do as we suggest, take legal opinion on the points.

YOKEL.—Are you a "Rip Van Winkle?" *Carte-de-visite* portraits have been done from life for 2*s.* 6*d.* a dozen, and even less, for years past in some places. Cabinets also for much less than the price you allude to. Do not think of going into any of the large towns to compete in price while you are doing a "snug little business" where you are. Probably you will not need this advice now that you are told these prices are common enough in most large towns amongst third-rate photographers.

B. LEWIS.—As the colourist, when acknowledging the order, acknowledged also the receipt of the picture and the money, you have a clear case. Summon him in the County Court for the amount you have paid and the value of the negative, and produce the acknowledgment in Court. It will be of no use his denying that he received either the negative or the money. A solicitor, if the case were put into his hands, might also obtain you damages for the loss of orders you have sustained.

T. R. C. (York).—The method given, like many other receipts handed down from generation to generation in receipt books, is of no use whatever. Methylated spirit, as met with in commerce, cannot be strengthened by allowing gelatine to soak in it to absorb the water. After several days' treatment, the gelatine will be found as hard and as crisp as at first, sometimes even more so, as the spirit will abstract the water from the gelatine if it contains any large proportion of it, thus becoming weaker instead of stronger.

EASTBOURNE.—There would be no novelty in transparent celluloid for lantern slides, as they were produced on that material years ago. Certainly a patent for it would not be worth the paper upon which it was written, if it were ever contested. Almost anything, however absurd it may be, can be patented, although the patent, when obtained, may be worth nothing. The English Patent Office seems to go upon the principle of taking the fees and asking no questions. Hence the responsibility for the validity or otherwise rests with the patentee, not the Patent Office. The patent law is widely different in many other countries.

G. OWEN says: "In THE BRITISH JOURNAL OF PHOTOGRAPHY of April 5 mention is made of a new monthly journal, *The Clerk of the Weather*. The address of the editor and publisher is also given, and the price, viz., 1*d.* per month. Thinking I should like to take in the paper, I sent up to the publishers 1*s.* 6*d.*, being 1*d.* per month for the paper, and ½*d.* per month for the postage. I received the paper for last month (April), but have not done so for this month. I have written twice to the editor, and twice to the publishers, and can get neither reply to my letters nor anything else out of them."—We have no further information about the paper referred to.

ST. CLAIR writes as under: "I should be much obliged if you would give me a reply to enclosed question. In building a studio with plain glass top and side lights, could I frost them over by using *Papier Minéral*, or can you recommend a better way of doing so? I should like to know the best way of using above *Papier Minéral*, either plain, or made transparent?"—*Papier Minéral* is transparent, or rather translucent, and it cannot be made more so. It is a very good medium for subduing light. But, in some aspects of the studio, a less transparent material is often required, such as muslin or tracing linen. A good material for obstructing light is starch paste mixed with whiting stippled over the glass.

SOFTNESS says: "You will find on page 262 of your JOURNAL these words which form a part of 'Cosmos'' correspondence: 'I presume the yellowish stain I am alluding to would serve just as well as "fog" for securing softness of image.' Now, Sir, in my humble experience I have come to the opposite conclusion, that yellow stain or colour in the slightest degree gives more contrast to the finished print than a grey or blue negative of same density. I feel certain that any practical photographer will agree with me on this point. I am surprised to have seen no contradiction to such a statement. 'Cosmos'' contributions I appreciate, but truly I had reckoned upon him as being a practical man."—In reply: "Cosmos," we fancy, is right, nevertheless.

C. G. writes: "I have a well-lighted studio, facing north-east, and use a 10×8 Watson's premier lens of thirteen-inch focus, but find, except in the morning, I have to give a longer exposure (with special rapid Ilford plates) than most people can endure. Do you think for sizes up to half-plate I should do better to use a smaller camera and shorter-focus lens? and, if so, what description of lens do you suggest? What I want to do is to take half-plate portraits quick."—If the proposed smaller lens has the same working aperture as the one now in use, no advantage will be gained. We do not know what the ratio of the lens named is, but a cabinet lens of the Petzval form, of about twelve inches focus, will cover a half-size plate with an aperture of about *f*-3. This is about the quickest-acting lens for that size plate that is made.

CONTENTS.

	Page
EXTEMPORISED DRY-PLATE MAKING	321
PHOTOGRAPHIC MOUNTANTS	322
FINISHING GELATINE PRINTS	323
JOTTINGS. By COSMOS	324
"MONOCOCYLMETADIHYDROXYLBENZOLZIRCONALLYLAUROMETHYLPHTALEIN." By G. WATMOUGH WEBSTER, F.C.S.	326
THE EQUIVALENOE OF THE ALKALIES. By W. B. BOLTON	326
PHOTO-MECHANICAL NOTES. By WILLIAM GAMBLE	328
STUDIO FURNITURE AND ACCESSORIES. By VALENTINE BLANCHARD	329
NEWSPAPER ILLUSTRATIONS. By THOMAS WAKEHAM LANE	329
"A. P." JOTTINGS. By LESLIE SELBY	331
THE PHOTOGRAPHIC EXHIBITION AT THE IMPERIAL INSTITUTE	332
WEST LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION	333
OUR EDITORIAL TABLE	333
NEWS AND NOTES	333
MEETINGS OF SOCIETIES	334
FORTHCOMING EXHIBITION	334
RECENT PATENTS	334
CORRESPONDENCE	335
EXCHANGE COLUMN	335
ANSWERS TO CORRESPONDENTS	336

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1830. Vol. XLII.—MAY 31, 1895.

CRUCIAL FOCUSSING BY EYEPIECES.

Some of the advantages which exist in the use of the new large aperture lenses, now so readily procurable, are sacrificed by the inefficiency too often displayed in focussing, thus not getting out of the lens all that sharpness capable of being attained. One may say that he invariably employs a magnifying glass to ensure the sharpest possible image on the screen. This is certainly better than trusting to the unaided eyes.

The best form of positive focussing glass, or eyepiece, is that known as the Ramsden eyepiece, which, as every reader probably knows, is composed of two plano-convex lenses, plane sides out, and separated from each other to the extent of a little less than the focus of one of them. The last one we had made for use as a focussing eyepiece had the following measurements :—

The lens nearest the eye is one and a half inch focus, and five-eighths in diameter. The one farthest from the eye is one inch in focus, and one and a quarter inch in diameter. When mounted in the tube their plain surfaces are one and a quarter inch apart. They are set in a tube, their plain surfaces to the outside, and this tube slides in a jacket, furnished with a clamping-screw collar so as to fix it all rigid, when once the adjustment has been made by pressing the end of the jacket against the plain side of the focussing screen, and focussing its ground surface. This adjustment serves once for all for that particular ground glass.

If for any special purpose, or to ensure still greater accuracy in focussing, a still higher power is desired, this is easy of attainment by selecting glasses of shorter focus, preserving as nearly as possible the same proportions as we have given above, and which are those found in several treatises on eyepieces. It is, however, not expedient that too great magnifying power be employed for a focussing eyepiece of this description, because a high power presupposes a tube too short for enabling the face of the observer to be brought into proximity to the screen.

This difficulty is obviated, and a better result obtained, by employing a compound microscope of what a microscopist would call low power. It should not have a stand, but should consist only of a straight piece of tubing; and, whereas with all other eyepieces the focussing screen ought to have a grey or roughened surface by which to arrest the rays, with a microscopic focusser it will be found more advantageous that it be of plain glass.

But we pause for a moment to speak of the inadequacy of even our best commercial ground glass to render justice to the highest class of critical focussing. We have found glass prepared in the following manner greatly superior, although we would hesitate to assert that it is the best : Obtain a sheet of polished glass that is quite flat, and, having made it scrupulously clean, hold its best polished side a few inches over a flat guttapercha or vulcanite tray, on the bottom of which has been sprinkled a little crushed fluor spar, which, in turn, is sprinkled with some sulphuric acid. This gives off fumes which will immediately act upon the glass exposed to them. Judgment is required as to the extent the corrosion is allowed to proceed. This gives a dull surface, of which the grain is finer than that of any glass ground by means of emery, and on which a sharp focus may be obtained with the aid of a high-power Ramsden eyepiece.

The microscope we recommend for the sharpest focussing possible to be obtained has an objective formed of two, or sometimes three, plano-convex achromatic lenses of the *largest* size supplied of the foreign French microscopic class, procurable at any of the dealers in cheap optical goods. They are usually screwed together, and are sold as French triplet inches, this being the combined power of the three, although they often vary in respect of real power. These are set in one end of a tube, and a strong Huyghenian eyepiece in the other end. The longer the tube the greater is the power, but for our present purpose five or six inches will suffice.

What is of importance is to have a sliding adjustable jacket on the objective end of the tube, so as to permit of the tube that contains the lenses being withdrawn so far back, when the jacket is pressed against the back of the focussing screen, as to show with the utmost distinctness any markings on the face of the screen. Delicate scratches suffice as markings, so does a small sprinkling of starch flour or anything that adheres to the surface of the screen, which ought to be plain glass in the sense of its not having been roughened by being ground. When once the focussing of such objects has been attained, the jacket should be tightened and never afterwards altered.

We recommend for rough focussing and composition of the picture a screen ground to the margins, with a portion left, polished in the centre, against which this microscopic focusser may be placed. The best way to make such a screen is to varnish a small space in the centre of the glass plate, of which we have spoken when describing the dulling of the surface by the fumes of hydrofluoric acid, afterwards removing the

varnish by alcohol when the etching has been completed. We have, however, seen a useful screen made by cementing, by Canada balsam, a thin microscopic slide cover glass on the surface of the ordinary ground-glass focussing screen.

GOLD SULPHIDE AND SULPHOCYANIDES.

A PAPER by M. A. Ditté, recently published in *Comptes Rendus*, on sulphide of gold, is interesting to photographers from the point of view of the increased value, through the presence of gold sulphide, of the silver precipitate from paper-fixing baths put in the residue vats, and thrown down with "liver of sulphur," or sulphide of potassium as it is commonly, but indefinitely, termed. This substance, in reality, as found in commerce, consists of a mixture of several different sulphides with sulphate, and frequently, with carbonate of potassium. And the confusion thus involved in the use of the term "sulphide" is that it may cause some who lightly read M. Ditté's paper, to imagine that the above-mentioned process of precipitation may lead to the loss of any gold that might be present in the old fixing solution. A little examination of the matter will, however, show that there is no fault of the kind to be found in this method. M. Ditté gives details which show, in the first place, that the comparatively roundabout method of precipitation with sulphuretted hydrogen recommended by some is inadvisable. He shows that with neutral solutions of gold there is no precipitation; a darkening takes place, but no deposit is produced. It is true that after a lapse of time the gold sulphide becomes gelatinous and insoluble, but it remains for a long time in suspension, and is recoverable by filtration. When the gold solution is made acid, however, a black sulphide is at once thrown down, and none of the previous difficulties occur.

The writer of the paper then proceeds to show that alkaline sulphides do not throw down any gold sulphides, the latter being soluble in a solution of that salt. But this sulphide is not the sulphide of the shops; it is the monosulphide, quite a different preparation. These reactions all refer to non-acid solutions; if free acid be present, the usual precipitation takes place.

Passing now to sulphocyanides of gold, it may be said that, owing to the common employment of toning baths made with this salt, the subject bears much more than a merely theoretical interest, and we draw our readers' attention to it in the hope that some one may see fit to conduct a series of experiments to ascertain the best way in which to mix the gold chloride and the sulphocyanide so as to produce the best effects, for it is quite possible that very different results may be expected from varying the mode of mixing and the temperature of the solutions in the operation.

It is quite certain that serious complaints are made from time to time about the greater difficulty experienced on some occasions than at others when using a sulphocyanide toning bath mixed in each instance in exactly the same proportions. And, again, some operators are troubled at a deep colouration, sometimes visible, and at others not seen, when mixing the two solutions. These variations may be due to the state of the alkaline sulphocyanide, or of the gold solution. When ordinary chloride of gold solution is mixed with one of sulphocyanide of potassium, a flesh-coloured precipitate is produced, which is soluble in ammonia. If, however, the gold solution be made neutral to test paper, the precipitate (auric) is orange red and voluminous. When separated, it is decomposed by water but dissolves in ether or in alcohol. If, now, the solution of the potassium salt be heated to 178° Fahr., and be considerably in excess, an aurous instead of, as in the former case, an auric, precipitate is produced, but it disappears on stirring. Probably the cause why ammonium sulphocyanide is usually recommended for the preparation of the bath is the greater probability of the ready solution of the precipitate through the presence of ammonia.

It is obvious, from this exceedingly brief account of the possible combinations of gold and sulphocyanogen, that there is great probability of there being a particular mode of admixture and of proportion of ingredients, and a particular temperature at which to conduct the operation, which would lead to the production of a toning bath at once uniform, certain, and excellent.

WANT OF HOMOGENEITY IN DRY-PLATE FILMS.

SINCE we wrote on the subject of spots a week or two back, we have received several communications on the subject, as well as examples of the particular form of spots we mentioned, and variations; in fact, the matter seems to be of more general interest than we at first imagined, and not, as it then appeared, confined to the productions of one or two makers.

On the contrary, we gather from the correspondence received that almost precisely similar effects are obtained upon plates of widely different character, and by at least half a dozen different makers; and, though the plates themselves can scarcely be said to be actually defective, the result of the peculiarity, if not watched for, may prove sufficiently annoying to give the plates a bad character.

The effect, as it first presented itself to us, took the form of a number of minute spots arranged in groups or patches, and chiefly of a perfectly regular shape, and apparently caused by the formation on the surface of the film during fixing of minute air bubbles, which prevented the action of the solution, and caused corresponding particles of undissolved silver bromide to remain after the rest of the film was cleared. These particles in turn, when the negative is taken into strong daylight, undergo reduction, and present the appearance of small black specks apparently caused by particles of foreign matter contained in the emulsion, although, if the plate be carefully watched through the different processes, their formation will be found to arise as stated.

We have now had our attention called to other varieties of this phase of irregular fixation, in one of which the spots take an irregular granular form, and, in another, the unfixed portions consist of broad patches or streaks, but in all cases conveying the suggestion that the effect is due to a condition of varying solubility in the bromide of silver itself. The peculiarity may be observed in different degrees of intensity with several different brands of plates; in fact, if closely watched for, it may be detected in almost any plate, although some show it in a much more aggravated degree than others.

In its original form as first mentioned, the origin of the air bubbles in the fixing bath is not readily to be accounted for, except on the supposition of impurities in the bath itself. In the case of air bells during development, the cause is easily explicable; but, when the surface of the film has been once thoroughly wetted, the fact of the formation of a series of

clusters of bubbles is strongly suggestive of some decomposition in the films or solution, leading to the evolution of gas of some sort that attaches itself to the plate in the form of globules.

What the precise decomposition may be it is impossible to say, but no doubt it is brought about by the action of traces of the developing solution left in the film acting upon the hypo. That very considerable traces of the developer remain in the body of the gelatine film, after the comparatively short washing generally given to negatives previous to fixing, is clearly demonstrated by the rapidity with which the fixing bath itself becomes discoloured; and, bearing in mind the reaction that occurs with hypo, it is not difficult to understand how quantities of gas may be evolved in or on the surface of the film to form the bubbles mentioned.

But the newer phases of the phenomenon appear to be of an entirely different character, and to arise from the presence in the film of patches or particles of a harder or less soluble character than the rest. The peculiarity may be observed, more or less, in almost any make of modern plate by turning it face downwards in the fixing bath, and watching the back of the film during the process of clearing, when the more slowly dissolving portions, either in the form of granules or streaks or patches, will be clearly shown. The difference in the condition of the bromide does not appear to extend to its sensitiveness either to light or development, for the most careful examination of the plate, either before fixing or after the completion of that process, entirely fails to show any variation in the intensity of the image to correspond with the markings referred to. In fact, the effect seems to be confined, as we have said, to a difference in solubility of the bromide of silver, arising from a want of perfect homogeneity in the gelatine film.

The question is, Does this arise from the gelatine or from the silver bromide? It is difficult to see in what way it can be traced to the gelatine, since in undergoing the processes of solution and filtration the latter must of necessity be reduced to a condition of homogeneity; and the same remark would seem to apply to the silver bromide, so far, at least, as the separation of the particles into an extremely fine state of division is concerned. At the same time, we cannot help setting the effect down to the bromide itself being aggregated into more or less hard masses, probably by the unequal shrinkage of the gelatine during drying. Even then it is hard to understand why a difference of solubility in the hypo bath should exist without a corresponding difference under the action of development.

We were at one time disposed to attribute the want of regularity to the employment of "separated" emulsion, *i.e.*, in which the soluble matters have been removed by the centrifugal machine and the bromide collected in a solid mass. But it is impossible to believe that, in the subsequent processes of reincorporation with gelatine, and filtration more especially, the silver salt should escape reduction to its original state of fineness of division.

Whatever may be the cause of this form of irregularity, the moral is obvious, namely, that we cannot be too careful in the matter of the fixation of negatives. Further than this no harm would accrue, but quite the reverse, from the adoption of the practice of more thorough washing of the film between development and fixing, for by the more thorough removal of the developing solution from the film the chance of the subsequent reduction of any undissolved particles of silver bromide would be materially lessened.

Aluminium.—A paragraph has been "going the round" that, in effect, in 1884, but 150 lbs. of this metal were produced in the year, and now the production is 339,000 lbs. annually, the reduction in price being from 35*s.* to 3*s.* 2*d.* per lb. Whether the figures as to the relative production be correct or not, there is no question that the use of this metal has been largely on the increase in photographic apparatus during the past year or two, and is still increasing—notwithstanding that some manufacturers charge much more for the fittings over those of brass.

Vignetted Glass Positives.—At the meeting of the Photographic Club last week what may nowadays almost be called a photographic fossil was exhibited. It was a glass positive, vignetted and coloured. According to the report it was looked upon by some of the younger members as a novelty, and this is not altogether surprising. We doubt very much if many of the modern workers of the positive process know how to produce a good vignette or a vignetted portrait at all, to say nothing about colouring it afterwards. The glass positive process, though obsolete in all good establishments, is a very beautiful process in the hands of a skilful operator, and must not be judged of from the results produced by the itinerant workers on the beach, Hampstead Heath, and like places. If we wanted the powder colours such as were used for the colouring of glass positives and Daguerreotypes, we certainly, at the present time, should not know where to apply for them. Speaking of coloured work naturally leads one to inquire if colouring small photographs has become an extinct art, as colouring rarely finds a place in modern photographers' price-lists.

The "P. B. A."—The letter in our last issue over the signature of Mr. W. I. Bird, suggesting a decent burial of the practically dead Photographers' Benevolent Association, is to the point. Mr. Bird has always taken great interest in the Association, and is also a good business man, whose opinion as such carries great weight. What is the use, it may be asked, of carrying on an Association in which those for whom it was instituted take no interest? Assistants clearly do not, neither do employers as a body. There might be an excuse for the former if the remuneration paid them generally were in accord with that offered in a recent advertisement, and which has given rise to some correspondence in our columns. Out of 12*s.* a week, with board and lodging, for seven days' work, even when paid by an "art photographer to the Queen," how much can a good operator, retoucher, printer, &c., contribute to the funds of the Association? We know that Her Majesty takes great interest in art and also in photography, but, till the correspondence has brought it forth, we had no idea that she had an "art photographer." It is more than probable, had the Queen known that presumably the principal *employé* had to work on Sundays as well as on other days of the week for the munificent salary just mentioned, she might have hesitated in making the appointment—if she has made it (?).

Mysterious Disappearance or Death of a Photographer.—An application was made to Mr. Vaughan at Bow-street on May 8, respecting the disappearance of Charles Beviss, a young solicitor, of Durban, Natal. He had come to England on a holiday, intending to return at the end of May, and had taken rooms at 25, Keppel-street, Russell-square. On Monday, April 22, he went down to East Greenwich, and engaged a boat, taking a boy with him as far as Woolwich, where he left him, saying that he meant to go on to Purfleet. Nothing had been seen of him since that time, but on the following day the boat was found at Purfleet, half full of water, and with the oars, &c., lying on the bank. No reason was known which would lead to the supposition that he had committed suicide. He is described as twenty-eight years of age, thin build, fair complexion, hair, whiskers, and moustache light brown, eyes grey. When last seen he was dressed in light overcoat, blue serge suit, light brown felt hat, spats, and lace boots. He leaves a wife and two children at Durban. It is stated that the missing gentleman purchased, on the morning of his alleged disappearance, (Monday,

April 22) a hand camera, which he is supposed to have taken with him on the river. For important reasons it is highly desirable that the vendor of the camera should be discovered, and we hereby invite the attention of the various London dealers to the matter in the hope that they may be able to supply the desired information. Communications should be addressed to Dr. A. C. Stark, 70, Guildford-street, Russell-square.

Photographs as Legal Evidence.—Those who can hark back a couple of decades will well remember the Tichborne case, or cases, and how photography figured in the proceedings. Indeed, in no case, either civil or criminal, up to that period, had photography figured so largely as evidence. Photographs were shown, and expert evidence was given, to prove that they were portraits of the real "Sir Roger." They were also shown to prove, *per contra*, that they were not, and experts were called to prove that the early Daguerreotypes were and were not the portraits of the same individual as those produced of later date. Notwithstanding that the juries in both trials were unanimous as to the imposture, many have still held to the idea that the claimant is really the lost heir, and this, till the last week or two, they have strenuously done. Photography has also within the past few years been invoked to aid in this belief in the shape of "composite photographs" to prove that the undoubted photograph, a Daguerreotype, of Roger Tichborne, coincided with portraits that had been taken at various times of the "Claimant,' and they were believed in by some. Unfortunately for the theorisers of composite photographs, Arthur Orton has now, inconsiderately, by his confession, pricked their bubble, and shown that such evidence, if it were ever believed in, is of no value whatever. Any practical photographer would have no difficulty in making a number of "improved" portraits of the same person, or a number of persons, from anything, or nothing, by the so-called "composite photography," even with or without a more or less stretching of the imagination—a thing always invariably present in persons being convinced against their will.

Copyright Union.—The letter in our last issue, anent that the week before from Mr. Gambier Bolton, with reference to the admission of amateurs into the Union, and the amount of the subscription, is certainly one for comment. With regard to the subscription, it is a question whether that proposed would be at all likely to cover the working expenses of the Union. The sum of half-a-guinea a year is not great when it is considered that a solicitor's fee, on a simple question of copyright, is two-thirds of that sum, and, unless the solicitor is well versed in copyright law, the opinion he may give is possibly not so reliable as that members would get from the Union. Again, as the minimum charge arranged by the members for the use of a single copyright picture is half-a-guinea, the first transaction covers a full year's subscription, if nothing more. With regard to the admission of amateurs into the Union, as suggested by Mr. Bolton, that has, doubtless, been considered before now. It has ever been a question as to where the line should be drawn between the amateur and the professional photographer. It has very generally been conceded that he who sells his productions ceases to be an amateur. Now, if an amateur, whether he be a member of the Union or not, sells his pictures with the right to reproduce them in an illustrated paper for a sum of money, does he cease to be an amateur, and no longer eligible, in future, to compete as an amateur for prizes? One would have expected that *bonâ-fide* amateurs would be content with supplying their works, without payment, to have their names mentioned. It would be interesting to know how many amateurs have registered the copyright in their productions, or give the matter a thought till perchance they may happen to see one reproduced.

THE LATE B. J. SAYCE.

We are sorry to have to record the death of Mr. B. J. Sayce, which took place at his residence, Parkfield, New Ferry, near Birkenhead, on Thursday, May 23. Mr. Sayce, who was fifty-eight years of age, had been confined to the house for some months with an affection of the heart, caused by the energetic life he had led.

The name of the deceased gentleman is assured of a permanent place in the annals of photography by reason of the valuable part he took in rendering emulsion photography practicable. It was in this Journal for September 9, 1864, that the brief but lucid paper, entitled *Photography without a Silver Nitrate Bath*, appeared over the signature of B. J. Sayce and W. B. Bolton, which described a method for the emulsification of silver bromide in collodion. The immediate practical outcome of the publication of the paper was to pave the way for the comparative desuetude of bath photography, the introduction of dry-collodion plates, and ultimately of gelatine plates, which, between them, have unquestionably been instrumental in carrying photography to the pitch of excellence it now occupies. The experimental work so happily begun was continued by Mr. Sayce during several succeeding years, and many practical ideas and suggestions subsequently emanated from him in connexion with the process.

Mr. Sayce was one of the original members of the Liverpool Amateur Photographic Association, in which he took a deep and active interest until the time of his demise. In 1888, when Liverpool was marked for the holding of the first International Photographic Exhibition ever instituted, Mr. Sayce was President of the Association, and he also took a large part in the affairs of the Association when, under the presidency of Mr. Adolph W. Beer, the first club-rooms, in St. George's-crescent, were entered upon by the members. For an exhibition of the method of his discovery Mr. Sayce was awarded a gold medal at the Inventions Exhibition, held in London in 1885, and of this signal honour he was justly proud. Mr. Sayce was one of the most popular members of the Liverpool Association, and was always ready with information and advice to those less skilled than himself in the art. The funeral will take place at Bebington Cemetery at half-past three o'clock this afternoon.

B. J. SAYCE.

The news has just reached me of the death of B. J. Sayce, who undoubtedly formed one of the links between the past and present of photography. Six-and-thirty years is a long spell in an ordinary lifetime, but looking back over that period, I can recollect Sayce, then in the prime of early manhood, an "old hand," even then, at photography. In those days, the practice of amateur photography involved something more than the mere purchase of a cheap camera and a dozen plates, for almost everything had to be done by the operator himself, and societies and instructors were few and far between. The attainment of any degree of eminence in the practice of photography at that time necessitated not only a real love of the art and science, but hard work and unremitting care, and the work turned out by B. J. Sayce in those far-off days sufficiently testified to the fact that he was an amateur in the truest and fullest sense of the word. I remember many of his pictures, taken in the old "tannin" days, or even as far back as the "honey" process, that would have done no discredit to the best workers of the present day, and only those who remember how wide is the difference between the bulk of the dry-plate work and the "wet" work of those days will understand what that means. His character as an amateur may be well summed up in a remark he once made to me, and which I have never forgotten. "I was never really satisfied," he said, "with a picture of my own, for, the more I examine them, the more I can see where they might be improved!"

A skilful and enthusiastic worker himself, he was never happier than when helping others; and, in addition to being one of the leading spirits in the foundation of the Liverpool Amateur Photographic Association, his office was the great meeting place of all that was eminent in the photographic world of that day, and it was there, if anywhere out of London, that novelties in the way of pictures or processes were to be seen and discussed. He and his friend, John Glover, with John J. Towson, formed a little coterie, in fact, of scientific amateurs that it would be difficult to match nowadays. Many a long tramp with the camera have I had with Sayce and his

old "chum," George Thomas, whose death was announced a few months ago; and, if we had to travel a long way for few pictures, somehow the negatives seemed worth much more in those days than they have ever done since.

How much emulsion photography owes to Sayce is a matter of history. He it was who grasped the situation and recognised the fact that it was the substitution of bromide for iodide of silver that rendered emulsion photography a practical possibility. His earliest dream was in the direction of an emulsion that would only require to be poured upon glass to be ready for use, and, though it was nearly ten years before that consummation was reached, it was probably delayed by the fact that Mr. Sayce was compelled on account of ill health to relinquish his photographic pursuits during many years, only to resume them when "dry" plates had become an established and universal fact.

Although, no doubt, emulsion photography would have become an established success before now, there cannot be a question but that Mr. Sayce's connexion with it had a material influence in hastening its development, for it will be remembered that he was one of a very small band who really understood the working of plain bromide films. It was, in fact, his experience with his own modification of Major Russell's rapid tannin process, based on the use of a plain bromised collodion and strong silver bath, that enabled him, with the then perfectly new collodio-bromide process, to turn out the almost perfect work he did, and those who examined his exhibits at the Inventions Exhibition will remember how near to modern perfection were some of his examples taken thirty odd years ago.

It is too much the fashion at the present day to imagine that it is only gelatine plates that are fit for rapid work; but I have in my mind's eye pictures of Sayce's taken in the early "sixties" on *dry* plates that were fully as quick as much of the snap-shot work of to-day, and, if not fully equal to modern work in the matter of exposure, at least prove that Mr. Sayce had brought his process to a far higher degree of perfection than was generally known. One particular picture of a ferry steamer, leaving the landing stage at full speed and almost broadside on, formed perhaps the most remarkable of his studies, while the most perfect pictorially were some views of the Channel Squadron lying in the Mersey in 1864.

Although, from his retiring disposition, B. J. Sayce of late years was comparatively little known beyond his own society and circle of acquaintances, he was a man who stood "head and shoulders" above the ordinary run of amateurs; and I for one willingly pay a tribute to the memory of a man who has done much willing work in the advancement of the science of photography. W. B. Bolton.

THE EXHIBITION OF THE PARIS PHOTO CLUB, WITH SOME REMARKS UPON THE POSITION OF PICTORIAL PHOTOGRAPHY IN FRANCE.

An important exhibition of pictorial photography, organized by the Photographic Club of Paris, has lately taken place; but it has, unfortunately, been passed by without notice of any kind by the press of our country, or even by our photographic journals. This is much to be regretted, for in the present position of pictorial photography, both at home and abroad, at a time when the most strenuous efforts are being made to place it in its highest position as an art, and to arrive at some general conclusions, at least, by which it should be governed, it would surely be useful that the different countries should have some knowledge of the steps which are being taken by each towards attaining these objects, and of the progress which is being made, and exemplified in the several exhibitions. Differences of opinion, also, as to the qualities which are desirable, or the reverse, naturally prevail abroad as well as at home; and it is instructive to discover, if possible, what influences have been productive of the greatest effect, what practices or methods first made use of by our country have been assimilated or followed by others; and how far, especially, the undoubted change of front, in recent years, in the appreciation of the artistic capabilities of photography has taken root and become familiar.

I had hoped to have been able to comply with the request of the editor of this journal to give, by a personal visit, a *compte rendu* of the Exhibition of the Photo Club, but the change of the date of opening, and my absence at that time in the far east, rendered this impossible. I have since had an opportunity of seeing a few of the works sent for exhibition, and of running through the collection of notices which appeared in the Continental press. Some reflections and considerations resulting from these may still, therefore, in the absence of a better record, be of interest.

I shall, however, reserve for a succeeding article the account which I may be able to give of the organization of the Exhibition and of the criticisms which it called forth from the foreign press, and address myself, for the present, to an important detail which I have now before my eyes, and that is the preface to the catalogue by Monsieur Frédéric Dillaye. To the whole tenour of that article I feel bound to take the gravest objection, and as it appears to lay down the law in an authoritative manner, and to be invested, moreover, with something of an official character, I regret that the space at my disposal will not permit me to do more than refer in general terms to the most important points. They are undoubtedly of importance, because, although I am unaware of the authority upon which M. Dillaye speaks to us—whether he is a photographer (for we do not know him as such), a painter, or merely a philosophical observer—his selection both this year and last as the writer of the preliminary notice places him officially before us as the representative of the Photo Club, and as the expounder, we may suppose, of its views.

In his preface to the catalogue of last year, M. Dillaye had already enthusiastically affirmed his belief in photography as an art. He now proceeds to inquire in what that art consists. He is evidently much disturbed at the development of photography which is illustrated by the work of the pioneers in what we know over here as "the new movement," and waxes wroth over what appears to him to be its unphotographic character. He states in the most definite manner that, "first of all, photographic art must remain very clearly photographic." Good, so far, on the understanding that we are able to satisfy ourselves as to the meaning of the expression, "purely photographic." He lays down that every work which endeavours to bring about a confusion remains a bastard and is to be rejected as art. One should not, he thinks, be pleased at finding that it *imitates* more or less well a charcoal or pencil drawing, or a water-colour. Good, also; no one, as yet, has advocated *imitation*. But he then proceeds to ask, "What is the characteristic of photography?" and he replies that it consists in "a complete, exact, even minute definition of every object depicted," and contends that photographic art—under the penalty, if it does not do so, of being no longer photographic—*must* keep this definition. But, having laid down the law in express terms, he then permits himself (simply according to his own discretion) to modify it, for he says, "should it keep it with its original absolutism? No, truly. The photograph would then have too much minuteness of detail, it would be too harsh; and these are defective qualities incompatible with art."* He continues, after remarking that the comprehension of these ideas has brought about a revolution which has been carried to extremes: "In certain foreign countries where photographic art has flourished sooner than in France two schools have been formed, the fuzzy and the *f*-64 (*les flouistes et les nettetistes*). The first will have nothing defined in their work; they exact from it a ridiculous vagueness in the outlines, in the forms, and in the masses. This can never be photographic art, for it is the negation of the characteristic of photography. These fanatics have even gone so far as to repudiate the lens. Now, the lens is the eye of the camera. To replace a good eye by a bad one, is it not recklessly to diminish its resources and to progress backwards? Without a lens photography is no longer photography, because it loses that exact definition of things by which it is characterised."

Now, in commenting on the above, I would remark that it is absolutely inexact to say that minute definition is the characteristic of photography. It is so of a certain kind perhaps, that is, of photography in which a lens is used in a certain way and is also much stopped down. Certainly the fanatics have the right to repudiate the lens, and still their work will remain photography—because a lens is not *necessary* in the production of a *photograph*, nor even, strictly speaking, is a camera or a gelatine plate. Neither is it true to say that without a lens photography loses the characteristic of exact definition, for (bearing in mind M. Dillaye's own modification and objection to too much definition and harshness) a pinhole is capable, if desirable, of a marvellous degree of definition; more, in fact, than, according to his own showing, M. Dillaye would admit to be artistic. And here I wish to ask, If M. Dillaye affirms the dogma absolutely, as he does, that a photograph to be photographic must keep the characteristic of "complete, exact, even minute definition," which he says is its own, what right has *he* to modify this *absolutisme originel* (note his own

* Doit-il la garder avec son absolutisme originel? Non, vraiment. L'œuvre photographique aurait alors trop de minutie et trop de sécheresse, deux qualités-défauts incompatibles avec l'art.

modification) and to deny an equal right to others? Photography, if his axiom is accepted, is bound, it seems to me, to progress backwards, and to revert to, and for ever remain in, its position of years ago. And if, as he says, photography without a lens is no longer photography, might I ask for his decision in the case of a picture very generally admired both here and in Paris—I mean Davison's *Onion Field?* Is it or is it not a photograph?

We next have in this remarkable and, I will say, important preface, a method laid down whereby art may be obtained in photography. The writer proceeds: "Photographic art consists in an image which is exact without harshness, possessing detail without being too minute (*exacte sans sécheresse, détaillée sans minutie*). It is attained in the shortest and best manner by making small negatives with as much sharpness as possible, and then enlarging these to produce the final effect. Is not this an excellent method of conciliating the two schools? Photographic art is to be above all looked for by the enlargement of primary negatives. By this means a result is arrived at which is no longer the *vague à outrance* of the *flouistes:* a sharpness is obtained which is no longer the flat, cut-out-of-zinc image of the *f*-64 school." A wonderful recipe, indeed! But wherein does the result as to sharpness differ from that which a pinhole can be made to give? It may be useful to examine by the light of this prescription the work contributed by our countrymen to the exhibition at Paris. We shall find that, out of forty-three exhibitors, only nine send work of which some is due to enlargement. It is true that amongst them are some of Craig Annan's beautiful pictures; but I think he would be the last to admit that their artistic quality was attained by such a very cut-and-dried method of conciliation.

It will be gathered, I hope, that my object has been to point out that our friends across the Channel still hold as diverse views as we do on this side. But they are now engaged in thrashing out these differences by the same arguments and the same hasty denunciations as were worked to death by ourselves years ago. M. Dillaye contributes also a critical article to the *Bulletin* of the Photo Club for April. In this he endeavours to enforce his ideas on art by the same methods of reference to the functions of the human eye, scientifically considered, as those which were discussed in our journals, four or five years ago, *ad nauseam,* and he brings also to bear the same array of mathematical formulæ, of equations and d into $x-y$, and so on, with which we were then dosed by our scientific teachers of art. Figures of the kind can be made to prove too much or too little; they neither convince nor interest minds otherwise constituted, upon which, in fact, their effect is absolutely wasted.

One thing is certain; that is, that the wave of revolt, begun amongst ourselves (more earnestly at any rate than before) some six or seven years ago, has found its counterpart amongst our neighbours and is with them increasing in force. I cannot believe that the maxims and ideas laid down in the preface to the catalogue of the second Exhibition of the Photo Club will find an echo amongst those who will form the ornaments of the many future exhibitions of pictorial photography which I sincerely trust it will be the mission of the Club successfully to hold. ALFRED MASKELL.

(*To be concluded.*)

LIPPMANN'S PROCESS OF COLOUR PHOTOGRAPHY.

[London and Provincial Photographic Association.]

EARLY in the year 1891, Professor Gabriel Lippmann, in Paris, announced that he had been able to solve the great question of photography in natural colours, with results that were perfectly permanent. The method by which he effected this is now well known. A plate was exposed in the camera with its sensitive surface turned away from the lens, and in contact with a film of mercury. On development, the colours of the subject were seen reproduced upon the sensitive plate when the latter was held at a certain angle. Such, in outline, was Lippmann's process—simplicity itself! In actual practice, however, it will be found to be hedged round by a number of difficulties which are not visible to the casual glance, and which are, without a doubt, the cause of the remarkable scarcity of specimens of the results which the process yields. It is upon some of these that I intend to touch to-night.

When it is borne in mind that theory requires the sensitive film to be built up in a number of layers or strata, the narrowest of which is no more than half the length of the shortest wave visible to our eyes, say that of about the G line—that is to say, one-half of seventeen millionths of an inch; and the widest of which is half the longest wave length visible, say B—that is to say, half of twenty-seven millionths of an inch—it is evident that the sensitive film must be of the finest possible nature, that it must be absolutely free from anything of the nature of *grain.* Lippmann, in his earlier experiments made use of the albumen process, which has long been known as one of those yielding a film most free from visible structure or granularity. These early specimens were very poor, and were altogether eclipsed, as far as beauty was concerned, by some exhibited the following year by the brothers Lumière at Lyons. These were produced on gelatino-bromide plates, prepared by a formula which has since been published.

In this formula, every possible precaution is taken to secure the formation of the sensitive salt in the finest possible condition of subdivision. The emulsion is prepared by making the following three solutions:—

A.	Gelatine	100 grains.
	Distilled water	4½ ounces.
B.	Potassium bromide	11 grains.
	Distilled water	2½ drachms.
C.	Silver nitrate	14 grains.
	Distilled water	2½ drachms.

All three are raised to a temperature of 35° C., and, when the gelatine is dissolved, solution A is divided into two equal parts, one of which is mixed with B. and one with C. The two solutions, B and C, are then mixed by pouring the silver nitrate into the bromide, well stirring the while. The points to attend to in this are:—

1st, That the temperature on no account rises above 40° C.

2nd, That the bromide is not in any greater excess than that mentioned.

3rd, That the operation is not unduly prolonged.

Neglect of any one of these points means that the sensitive salt will be in a coarser condition than would otherwise be the case.

As soon as the emulsion is made, it should be filtered through leather, cambric, or hemp (this last is recommended by Valenta), and the plates coated without delay. This is done by pouring the emulsion over the plate, back again into the jug, and then whirling the plate to secure as thin a film as possible. As soon as the emulsion is set, the plate should be immersed for a minute in alcohol, washed in water for ten minutes, and then dried. To render the plate orthochromatic, it can be subsequently bathed, or the emulsion may have been dyed at the outset. I prefer the latter, since every re-wetting and drying the film undergoes tends undoubtedly to render the emulsion coarser.

Plates so prepared are remarkable enough in appearance. The emulsion itself, especially when dyed, is not unlike table jelly, being almost perfectly transparent. The plates when dry should not have more than the faintest opalescence.

I pass round a plate so prepared; the emulsion in this case was dyed with erythrosine.

For exposure in the camera, a special dark slide will be necessary to hold the plate in contact with the mercury. An arrangement which has been made for me by Mr. Beard, and which answers perfectly, I pass round. A certain amount of pressure is requisite to hold the mercury in, as it is very prone to work its way out of the trough, especially when there is any height of mercury in the vessel. The mercury is conveniently kept in what is known as a separating funnel, with a little strong sulphuric acid above it to keep it dry and clean. When the plate is placed in the holder, its outer surface should be carefully cleaned and polished, and covered with black paper all over, except just where the image will fall. This is most essential, as the plate with its mercury backing forms a most perfect mirror, and the amount of stray light in the camera is something considerable. It is now ready for exposure.

All the precautions which have been taken to ensure the grain of the sensitive salt being as fine as possible are also precautions to ensure the plates being as slow as possible. Some idea of the remarkable speed or want of speed of plates prepared as above described can be gathered from the fact that at midday the other day I exposed one of them to bright sunshine for one minute under a clear, bright negative, and the resulting transparency was, as near as I could tell, properly exposed. Messrs. Lumière increased the sensitiveness of the plates by immersing them for a couple of minutes in distilled water, containing one-half per cent. both of silver nitrate and glacial acetic acid, and drying them. Valenta recommends the addition of one-third per cent. of sodium sulphite to the emulsion, and then ripening at a temperature of 38° C. I myself have been unable to effect this without the formation of a grain sufficiently coarse to render the plate useless for the purpose required. The silver bath undoubtedly makes the plates about as fast again, but I have not noticed that the colours are any brighter when it is used than they

are otherwise, although this is said to be the case. When the silver nitrate bath is used, the silver is allowed to dry in the film, but removed after exposure and before development by washing in water.

When the plate is taken out of the dark slide after exposure and the mercury poured off, it will probably be found that the mercury in parts adheres closely to the gelatine, and it will require to be gently brushed with a very soft camel's-hair brush to remove it. I am at a loss to account for this phenomenon. It generally takes place near the edges and towards the bottom of the plate, and after development these places always have a kind of stain upon them where the mercury has adhered; moreover, sometimes it is impossible to brush the whole of the mercury off the film—it appears to have become imbedded in it. When the plate has been backed with mercury, it will be found, in most cases, to have upon its surface air bubbles which prevent the mercury in those parts coming into direct contact with the film. When this is the case, the bubbles should be gently touched with a camel-hair brush, to cause them to break and ascend. If these bubbles are not removed, they will give rise to dark spots in the resulting picture.

Pyro and ammonia undoubtedly yield the most satisfactory results in development. I have tried metol, ferrous oxalate, rodinal, and pyro-soda, but in no case were the colours so brilliant as when pyro and ammonia were employed. Messrs. Lumière lay great stress upon the exact strength of the ammonia, but I have not been able to detect much difference myself. Still, my own results up to now have been so imperfect that this is nothing to go by. For fixing purposes cyanide solution is preferred to hypo, but if it is employed the greatest care must be exercised to prevent it from attacking the deposit, a thing it is extremely prone to do, and which is rendered very easy by the fine state of division in which the deposit exists. The developer employed by Messrs. Lumière is of the following composition :—

Pyrogallol	0·1 parts.
Potassium bromide	1·5 „
Ammonia (s.g. ·96 at 18°C)	5 „
Water to	100 „

The action of this is almost instantaneous, the full density possible being acquired in about ten seconds.

The colours do not become visible until the plate is dry. When wet the appearance is remarkable. A deposit, in the form of stains and markings, has, in every case in my hands, been visible over the whole plate, *except* where the light had fallen, which when wet appeared perfectly transparent. This appearance is very singular, and one soon gets so accustomed to it that it becomes unnecessary to wait for the film to dry to know whether the colours will be visible or not.

You will notice that I have spoken about the colours as if it were not invariably the case for them to be visible. It depends largely upon the amount of exposure which the plate has received, upon the proper dyeing or staining of the film, and upon the employment of suitable colour screens. The examples I show to-night, you will observe, are all deficient in the yellow and red, especially the red. This is due to their having been treated with erythrosine only. I have now in hand a series of experiments upon the employment of cyanine in conjunction with phosphine, as recommended by Mr. J. W. Gifford, in a paper read by him recently before the Royal Photographic Society.

In carrying out experiments as to the best method of orthochromatising a plate for this process, it has to be borne in mind that the aim is different here to what it is where the question is the correct reproduction of a picture, or a scene from nature, in monochrome. In this latter case, what is required is to obtain a negative in which the amount of deposit in the various parts, coloured in the original, is inversely proportionate to the apparent luminosity of the colour. For example, a dark blue and a brilliant yellow will be best rendered, in such a process, the one by merely a trace of deposit, the other by a great deal; so that when we come to print, the yellow will print out nearly white and the blue nearly black. This is, of course, what is required for copying a coloured subject correctly in monochrome.

With the Lippmann process, however, our aims must be different. The colour of the result is due not so much to varying amounts of deposit in various parts, as to a variation in the position of that deposit in the thickness of the film. What is wanted, then, is rather a plate which is equally sensitive to blue, to green, to yellow, and to red, rather than one which is more sensitive to the more luminous part of the spectrum, and less sensitive to the less brilliant colours. It will been seen then that the problem of the reproduction of the colours is different in principle to that of the correct rendering of colours in monochrome.

Kroné, of Dresden, has repeated Lippmann's experiments, but has substituted black velvet for the mercury. In this case he depended, of course, on the reflection from the outer surface of the film itself, which was in contact with the air. I have not tried this plan myself, but in view of the fact that colours are frequently visible in these experiments in parts which have not had any mercury backing, although always feebler than where the backing has been used, it seems feasible enough. I cannot help thinking that some of the coloured results, of which we have heard on and off in the photographic press ever since Senebier's publication in 1782, have been produced accidentally by the effects of interference in a finely divided film—an impression which has grown stronger since so few of these colour experiments can be successfully repeated by following the complicated directions often given by the inventor, under what I believe to be the erroneous impression that they were the cause of his success.

The examples which I pass round appear very much less brilliant than Messrs. Lumière's results, shown at the Photographic Conference; but, as Mr. Ives has stated that a great increase in brilliancy is caused by the glass prism, which in the examples alluded to was cemented with Canada balsam to the surface of the glass, I am unable at present to say how nearly my results approach theirs. It is a peculiar feature about these that the red is always most brilliant when viewed from the film side of the glass, and the blue when seen from the other side. The colours, moreover, depend very largely upon the degree of moisture present in the film, which is quite in accordance with theory. On breathing on the film it will be seen that the colours change, the laminæ are separated farther and farther apart by the expansion of the film, and the colour due to interference becomes in consequence of greater and greater wave-length.

I can only say, in conclusion, that I have found the experiments most fascinating, and that the whole matter is in need of a great deal of elucidation, while the processes employed must most certainly be susceptible of a very great amount of improvement—both points which should render it particularly attractive to the experimenter.

R. Child Bayley.

SOFTNESS OF DEFINITION.

Mr. Dunmore is kind enough to reply at considerable length to my remarks upon the above subject, and I have to thank him for his kindness.

We are so much at one, that his last communication scarcely calls for reply from me, and yet I cannot forego the opportunity of a little longer friendly talk with Mr. Dunmore on a subject which interests me very much.

With regard to idealism in photography, it is plain that photography can only express what comes up before the lens, quite independently of whether it happens to be any one's ideal or no.

It follows from this that idealism, in its strict sense, is denied to photography for the simple reason that no photographer can express his ideal by photography unless he happens to stumble across his ideal *in concrete form*, when, of course, it is no longer ideal, but real. It may happen to *coincide* with his ideal, but an idea is a *creation*, and, until the photographer is to be credited with the creation of the *concrete form*, he can scarcely expect to palm off his picture as *his* ideal. If one could photograph thought, or conjure up, by some magical means, a concrete form before the camera, and photograph that, then idealism, in its true sense, would be within the grasp of photography; but it is not now. A painter has this power; he may set himself down, in the most commonplace way, to copy from nature, but every touch of his brush is the outcome of thought, the whole picture a mere personal idea of the artist's, and idealism strictly within the grasp of his art. This, I think, coincides more or less with Mr. Dunmore's ideas on this point.

With regard to sharpness, Mr. Dunmore cites the case of the blurring which takes place by the want of homogeneity in the atmosphere on a hot day. This, of course, I admit, but, as Mr. Dunmore seems to imply himself, it is more a *distorting* of outline than a softening of it; in any case, I am sure that not every "fuzzytype" that I have seen was meant to represent this phase of nature.

With regard to the last point, that is, What is a *good* photograph? Mr. Dunmore says a good photograph must be "true to nature, and true to art."

I do not forget, of course, that I suggested this limitation of definition by my question; but, assuming that Mr. Dunmore is content

so far with it, I would like to say a few words thereon. It seems paradoxical, but it is true, there is *too much* nature in our photographs.

Some time ago I was sketching by the riverside with an artist friend of considerable talent and repute. We were painting in water colours, and agreed to take precisely the same subject, as it would thereby be a better lesson for me. From time to time he would mutter, "Stick to literal fact now."

In two hours or thereby we compared results, his was a picture "true to nature and true to art"—mine! well, never mind! His first remark on seeing my production was that my "black and white was all wrong." Now, if I had been careful in anything, it was to put in the various parts with just the depth of tone of nature. A huge black rock, much the blackest object in the whole picture and lying in the foreground, was the blackest object in my picture. I instinctively turned to his, and found that it was not the blackest object in his picture by a long way. I tackled him on the subject. He allowed my picture was truer to nature than his, but said the "composition" demanded that he should suppress the power of that rock.

I was pleased so far, but in the evening he took back his admission that my picture was truer to nature than his, and said he had been thinking over it. The result was this. He says: "You painted in that rock as if it was the only part of the picture that was to be painted. When you painted that in, you let your eye rest upon the big black stone before you, and forgot that what you intended to represent was the scene as it presented itself to the eye *roaming over the whole composition*. "Stand," he says, "here, and look out of the window." I did so. "Let the eye wander pleasantly over the whole, but let it come to rest nowhere." I did so. "Now, where is your deep dark?" says he. I pointed out a shadow under a bush. "Yes, that was right. Now," says he, "deliberately compare that shadow with this dark mass in the front." I looked to the immediate foreground, and was surprised to find a much deeper dark. "Now," he says, "in sketching it is the first effect you must try to get. You are *not* to concentrate your attention upon *part* after *part*, or you will get all wrong; when your eye was roaming over the whole composition, you failed to see that black patch in the foreground," says he; "but, if you had been sketching, you would have concentrated your vision upon it, to the exclusion of the composition as a whole. Now, my eye," he says, "took in the general effect of the scene, it was perfectly unconscious of the huge patch of black which you saw; and why? because you left your point of sight," says he, "and turned your eyes and let them rest upon it, which you ought not to have done." Some time before, when I had asked my artist friend for a definition of art, he abruptly answered, "Fakement." He now withdraws that expression, and says that the numberless hints that he has given me from time to time are not mere inventions or tricks to produce effects, but are really dictated to him by nature, only he never thought much about how or why they came to be a necessity in picture painting.

Now, this is where photography fails. The photographic lens is in the position of the tyro in art, it reproduces each individual part very perfectly, but as a complete picture in itself, and not as part of a whole. It is not that *necessity* has forced artists to suppress here or accentuate there; the arrangement is found in nature, *as seen by the human eye*. No one can have any idea how small the angle of visual acuity is until they have examined into it, or how very differently the intensity of a black looks, according as the eye is allowed to rest upon it or no.

The artist gives the effect, not of a stationary gaze, as the lens does, but the effect as produced upon the ever-moving human eye—a very different thing.

The late Sam Bough told me that in sketching from nature he looked long before he began, but, after his brush was on the paper, he never looked up till the sketch was finished. He steeped himself in the general effect, as it were, but made no study of the various parts, and, no doubt, he felt that he got a truer effect this way, otherwise he would not have done it.

It is not detail that destroys our photographs, it is the white and black that is all wrong. If some one would only give us a method by which we could have thorough control over the black and white in our pictures, photography would have infinitely more interest, and be capable of greater things.

Photographs lose much in so far as the art that produces them leaves no trace on the face of them. For all that one sees of man's passage in them, they might have been produced by a streak of lightning, or other natural phenomenon, if this were possible. There is no doubt that masterful handling of the brush is a great charm to the educated eye apart from the subject altogether. I call to mind the beautiful studies done by Sir David Wilkie for his larger pictures, and, although these are mere fragments, so to speak, what a charm there is in the masterful handling so evident on the face of them! The greatest art is to conceal art, they say; for my part, I cannot see that anything merits much admiration that is not visible.

J. K. Tulloch, M.B.

PHOTOGRAPHS—GOOD *VERSUS* BAD.

[Photographic Scraps.]

If the reader is of an observant nature, it is probable that the matter of good photographs *versus* bad photographs cannot have escaped his notice, and, as a secondary issue, the modern methods of reproduction, termed "process" work, will not have failed to attract the attention of all such as are interested in pictorial art, especially photographers.

I should not like to think I am pedantic, neither am I, but I want photography to progress. Progression can never happen through any method of retrogression. The time was when no other means ot obtaining a positive picture (I purposely omit all allusion to collodion positives) were available but by the use of silvered paper toned with gold. I ask myself, Were ever better pictures made than by that method? Before answering my own question I am obliged to consider that there are various "schools" or "cults," whose tenets have to be tolerated, whether they be right or wrong. It may be argued that the very slow methods of obtaining pictures are not suitable to the requirements of the present day, nor perhaps are they from a strictly commercial point of view, but I hope we have something better to look forward to than the mere question of how cheaply or how many thousands per hour can be machined off, like the issue of an evening paper. I am not disposed to think that rapidity alone would ever advance the artistic qualities of positives, whatever it might do for negatives, and I do not wish to be misunderstood in this relation, or for it to be imagined that I am arguing in favour of the slow methods generally. Rapidity in plates is a most desirable property. Here time may be well and judiciously spent in selecting, arranging, posing, or composing the subject—frequently insufficient time is devoted to this and the result is marred—but, when once the arrangement on the ground glass is secured, then the exposure of the sensitive plate to the image may, under most circumstances, be as brief as is consistent with due control over the exact duration of such exposure. In the after-part of the process of developing the negative no one can reasonably argue that time is ill spent if it enables us to produce a result as near perfection as our present knowledge permits.

The heading of this article may convey an imperfect idea of my views if I do not explain that a photograph may be good or bad just according to the way in which it is considered; for example, a photograph, even when reproduced by any of the mechanical "process" methods, may be all-sufficient for commercial or advertising purposes, but still very bad as a photograph. Its technical errors or exaggerations may make it even more useful as an advertisement than if it had been more correctly technical or more true to nature. We have probably no great grounds to demur to the extensive use of photography for commercial or advertising purposes; the materials used and the people employed doubtless far exceed what would be required in portraiture, landscape, or amateur work combined, but I fail to see how higher-class photography can be benefited by the production of any work bearing an exaggerated aspect such as we see in the advertising photography, and especially that reproduced by "process" work at the present day.

The photographic or photo-mechanical processes at present in vogue are so numerous that I am unable to enumerate them, and I can only refer to a few in my remarks when I allude to their influence upon photography for good or for bad. As each new method has been made public, it has nearly always been claimed for it that it would supersede every other process. This happened with carbon printing, Woodburytype, collotype, and others, but we find that, good as they all are or may be, they have their day and their shortcomings are found out, and something else gets a turn. It might be thought that that process which yielded positives truest in relation to the negative would be likeliest to take the palm; but there is no such perfect process known, for every printing process is susceptible of error or exaggeration, either by accident or design. Very frequently this facility of producing exaggeration is seized upon as a valuable quality whenever it is required to produce prints in strong contrast, such, for instance, as those illustrating the cheap comic papers of the day. These do not admit of half-tones at all; they can only reproduce lines, and such objects as contain only black and white without any shading. The so-called half-tone methods do, in a certain way and under some circumstances, produce satisfactory results, and occasionally we see excellent reproductions; but these methods are not universally successful, and not unfrequently the results are very bad.

The producer of a negative can usually tell at a glance whether it will yield a good print in the ordinary way on silver paper. As most negatives are taken with that ultimate object it is scarcely likely that the average worker will in any way alter his method for the remote contingency of their ever being printed by a "process" such as that attempted in *Scraps*. To machine off some thousands of impressions along with the type would, for certain purposes, be a welcome adjunct to our art

could such a progress be brought to perfection; but I take this firm standpoint, when I say that a reproduction loses its charm, its virtue, and its individuality as soon as it becomes a reproduction. I maintain that a print produced in any other way than from the negative is no longer a work of art. Bear in mind I wish to make my contention clear; I desire most emphatically to keep art and commercialism quite separate. If a soap man buys a painting with the right of reproduction or a statue ditto, ditto, that may sell the soap, and that is his aim, but it does not make the soap art-soap.

My idea of art in relation to photographs would be the production of the most perfect negative, the taking of the best print possible, and then the destruction of the negative. That sounds harsh perhaps, but it is on all fours with other things. Ask the President of the Royal Academy what he would charge for a copy of his Exhibition picture, and in all probability he would tell you that he never yet made a copy, and he never would.

But to the point, Good *versus* bad photographs. In my walks and travels what do I see? I may tell you, at once, that I see a very great deal of bad photography. I feel ashamed to say it: I see photographs, of large size too, in which under-exposure predominates. I saw a group of hounds, the property of a sporting nobleman, so dreadfully under-exposed as to suggest that it must have been taken in moonlight. As I lay in bed in an hotel in the midlands a few weeks ago, my eye rested on a photograph of a celebrated mansion, the residence of a great statesman. Distance is said to "lend enchantment to the view." Possibly it does, sometimes; but I could not make this one out. When "boots" hammered at the door, with hot water, I wound up the blind to scrutinise this photograph; it was on 10×8 or 11×9, and showed every bit of its area; had the artist cut it down to 10×6, he and picture would have benefited. But let me describe it; exactly one half was occupied by parterres forming the whole of the foreground; then came the mansion, whose extreme height did not exceed one and a half inches, and then, above that, some three inches of white sky. The mount was embossed with the stamp of the artist, a man of some note, who ought to have known better. The negative was over-exposed for the mansion (light stone), and under-exposed for the parterre foreground (dark plants and evergreens), and now, having described this photograph, I shall not say one word more about it, but leave the reader to think.

Can photography lie? Yes, advantageously as well as adversely. If the sellers of a baronial estate asked me to photograph its chief points, do you think I should represent the mansion as though a thunderstorm was about to burst over it? Would I represent the park with the trees in bloom and snow on the ground, or show the church and village as a veritable "city of the dead?" No. As the auctioneers say, "you must put the best side towards London," and who will blame you? Just look at the gross exaggeration of the coloured pictures issued by foreign railway companies (and home railway companies too) of places of fashionable resort. They are lies; but photography, with all its failings, cannot lie like one of these. Photography generally lies by ignorance, or, in other words, it portrays things really worse than they are, in this respect, that nine-tenths of photographers fail to select such points of view and give such exposures and subsequent treatment to their pictures as shall ensure summery, lively, and balmy qualities to their prints, *i.e.* good photographs.

The vast number of pictures I see in which perpetual snow seems to dominate moves me to ask my readers whether they are unable to overcome this. I am fully alive to the fact that under most conditions of light there are certain to be some glaring high lights where they are not wanted. The human eye compensates for this, and as we do not see all of a subject at once, as the camera does, we are incapable of retaining for more than an instant what falls on the retina; instantly the aspect of a portion of a subject is forgotten, and the eye has to travel back again in order to revive the impression. A few of us are quick enough to pick out the objectionable points in a subject, and instinctively to take means to subordinate them, so as to bring the whole into monochromatic harmony. Every observant photographer knows what a glare will come off water at a given angle; it looks like ice in a photograph. So also the glint off foliage, wood, stone, dusty roads, not to omit the white line down the nose, the brow, the high cheek bones, and the hands, in portraiture; these all give trouble, but it is the competent man who deals with them in such a way as to reduce their effect down to such a point that they are no longer offensive. This will make the difference between a good and a bad photograph.

I have so often dealt with over and under-exposure that I need only recur for a moment to point out how deplorable it is to see work sent out by photographers in which one or other of these defects ruins the picture. What possible excuse there can be, I do not know. If a photographer is sent for to photograph a wedding group on the lawn why does he not take two, or even three, plates of each grouping, giving different exposures? Are not plates cheap enough? If he works 12×10, won't the "job" stand half a dozen plates for three positions or a dozen plates for four or six positions, at prices of, say, thirteen shillings per dozen? If every one of the negatives turned out well, his printing operations would be much easier. There are some subjects which require to be successfully dealt with once and for all, no second trial allowed; the wedding group is an example, for what bride would ever consent to come back the next day because the photographer had made a mess of it? Here you see the absolute necessity of making a good photograph.

On perusing my remarks I see I have omitted any reference to the quick method of printing known as development printing on bromide papers. Well, these have their votaries, there being many who admire the cool grey tones, and in the very best work there is not much to complain about. But bromide paper has all the faults of exaggeration named before; if the prints are vigorous, the blacks are too massive and the whites too chalky, and oftentimes the medium results in a wish-washy flat print, numerous examples of which are unintelligible to me, as I fail to make out what the details of the subject are. I fear that development papers will never compete with print-out papers, notwithstanding that every print comes direct off the negative, and therefore escapes my ban of reproduction processes.

TECHNIQUE.

"AUTO, ORTHO, CHROMATIC."

How I Recovered My Money by a Fire Insurance Policy.—A Romance in a Modern Pharmacy.

(By a Local Chemist.)

A few weeks ago the South of Ireland was honoured by the visit of a celebrated Russian scientist. He was a man of slight build, average height, and of gentlemanly appearance, and spoke English fluently, with a slightly foreign accent.

He called at my establishment and introduced himself to me, presenting a card and saying, "No doubt you have heard of me before, as my name has appeared in all the scientific journal as the inventor of the celebrated 'Auto, Ortho, Chromatic Solutions' for producing colour in photography." He ran over the names of many well-known scientific gentlemen, all of whom he said he had interviewed, had worked with Captain Abney, who pronounced his patent perfect, enlarged on Ramsay's theory, and finally worked out most elaborate chemical equations as the formulæ for this "El Dorado," remarking with a beautiful smile, "You see I am quite in my element here."

He then enlarged on the profits which could be made, which would recoup me for any trouble I may take in introducing this solution.

I was fairly dazzled by the golden prospects, and was all ambitious to secure so rich a treasure, and timidly asked the price of each small bottle (2 oz.).

"The price is only 25 francs," said my scientific friend, "and if you will buy, say, six bottles, I will make you sole agent for Ireland, as I have not called on any other. In fact, I have only just run though by Dublin to join the American mail, as I am going to New York to lecture by invitation, afterwards I will visit all cities of importance."

I saw he was pushed for time, and so hastened to secure the agency, and paid him 5*l.* 10*s.* I asked for printed matter in reference to the solution. "I am sorry to say," he said, "I have given all my English copies to Messrs. Valentine, whom I have appointed my Scotch agent, but will write him to send you a few copies; besides, when I go down to Queenstown this evening, I will send you some German prints which you can get translated."

We parted the best of friends, and I felt pleased with my morning's work.

Some time after he had gone, I mixed some of the solution in a large flask, which I placed on my front counter, where it was much admired by many of my customers, as it reflected the most beautiful green colour I ever saw, but I feel almost ashamed to confess, as I found out afterwards, that I was much more verdant.

The next day after my learned friend's interview (who by the way forgot to post the promised pamphlet), I had a visit from a friend who is a member of the Camera Club, to whom I lost no time in introducing the solution, and began to enlarge on its merits, and told him I expected a pamphlet in reference to same by next post. It should have come by the morning's post, but, no doubt, I should have it by the evening's. He smiled, and said, "I am sorry you have been taken in. We have had private information from Dublin of this intended visit, and were put on our guard. I am afraid you have lost your money."

I was beginning to feel a little uneasy, and this news seemed to coincide so well with the non-arrival of the papers, confirmed me in the suspicion that I had been taken in. However, I made no sign that I thought so, and would wait events. Three days passed, and no news from Scotland. I wrote to Messrs. Valentine, and in due course received a reply that he had never seen Dr. —— or his solutions, and knew nothing of any pamphlet.

I was now thoroughly convinced that I had lost my money, and made a silent vow if I should ever come across the learned docter after my interview I would cry quits. But of this I had little hope, as I believed he was on his way to New York, if not already there. The beautiful green colour now became so painful to my sight that I was glad to be rid of it, and so packed it away without even testing it, and I firmly believed it was quite in keeping with the rest of my learned friend's transactions. I also learned he had two agents already in Dublin who, no doubt, have arrived at the same conclusion ere this.

It is now the 18th, and time, the great healer of all smarts, had removed from my mind any sense of loss, when to my surprise I heard

that the learned doctor had not gone to America, as he was seen that evening promenading the beach at Queenstown.

I lost no time in going to our resident magistrate, stated my case, and asked for a warrant for the arrest of this gentleman for obtaining my money by false pretence. The magistrate received me very kindly, and patiently listened to my story, and impressed on me the seriousness of the course I was about to adopt, and advised me to have an interview with the learned doctor, and not to take the warrant, to which he said I had every right. This I saw was the wiser course, and, accompanied by a detective officer, I started for Queenstown by the last train, arrived at midnight, and searched all the hotels, but could find no trace of the gentleman in question. We then reported ourselves to the constabulary, had an interview with the head constable in charge, who promised to give all the help in his power, and would meet us at the pier head in the morning.

I then went to my hotel, time 1.30 a.m., turned into bed, had a short sleep, and awoke in nice time, and appeared on the pier head at five o'clock a.m., where in a short time I was joined by my two friends. We visited all tenders taking passengers out to the big liner, but failed to see the learned doctor, and was obliged to come back to Cork, much disappointed, but still with great hope, as, on considering the matter well over coming up in the train, we came to the conclusion that our friend spent but a pleasant evening in Queenstown, and had gone back to Cork, and would, no doubt, be found in one of the hotels near the railway station.

Feeling very tired, I asked the officer to look up these hotels, as I would drive home, and he could report the result of his visit later on. Within half an hour my friend called on me and said, "It is all right, sir; our man is safe enough. I called at one of the hotels mentioned, and saw the owner, asked him if he had a doctor So-and-So staying here. 'Yes,' said he, looking somewhat alarmed; 'but you surely do not want him?' 'Oh, not at all,' said the officer, 'I am merely waiting inquiries as to his address for a gentleman who wants to interview him in reference to his great discovery.' 'Glad to hear that,' said the landlord, 'for he has just borrowed 5*l.* from me,' producing an I O U for that amount."

On learning this from the officer, I now felt I was face to face with a very serious undertaking, and, after consulting a professional friend, I made up my mind, if I was to recover any money at all, I should have to administer a very large dose of that excellent physic called "Bluff."

Thinking the matter well over, I decided it would be well to go armed with some legal document of which there could be no mistake, and on looking over some documents in my safe I selected a fire policy of the Royal Insurance Company with its great red seal. I then folded it up so that the red seal should appear on the outside, and placed it in the breast pocket of my coat, and, accompanied by the detective officer I arrived at the hotel. I then left the officer outside, walked in, and asked to see the proprietor. He having come forward, I asked him for the use of a private room for a few minutes, as I had come on very important unpleasant business and did not wish to cause a scene in his house. "You have a Doctor —— staying here, who, I am sorry to say, has obtained 5*l.* 10*s.* from me under false pretences, and, (unbuttoning my coat I displayed the great red seal, saying) this is a warrant (but for what I did not mention), and the officer is at the door. I shall be much obliged if you will kindly tell the doctor I wish to see him."

Having shown me into a private room, I there awaited the doctor, and could not help smiling to myself as I thought of his little joke in reference to his address, which he gave—the Palace of Justice, Moscow, remarking it had been built in memory of the great Napoleon, who he was sorry to say did not there receive the justice which he deserved, but had to go to Waterloo for it. While waiting I was able to take a good survey of the room, and thought it was better to have the table between me and the doctor, as I did not feel very sure how my gentle Russian would take what I had to say. In two or three minutes the door was swung open, and in walked the doctor smiling (and as I afterwards thought expecting a repeat order).

I immediately assumed the tragic. He held out his hand to welcome me; but, looking him straight in the face, I said, "Doctor——You no doubt remember your visit to my establishment, and that I received you as a gentleman and a man of honour, and how you sold me the sole agency for Ireland for your solutions, and promised to forward me pamphlets in reference to same, which you never did, having at the same time appointed two agents in Dublin. I now charge you, sir, with obtaining my money under false pretences, which charge I have laid before the resident magistrate (and unbuttoning my coat I displayed the great red seal of the Royal painting, to which I said). This is a warrant, and the officer awaits you at the door outside. At the same time, I do not wish to deal harshly with you, but will give you the choice of two things —my money or your body."

The effect was truly wonderful. He made no excuse, but said, "You shall have your money back. You will allow me to go and get it." I said, "certainly, but allow me to impress on you, before you leave the room, that if you attempt to evade me or leave the house (pointing to my friend the Red Seal) I shall hand this to the officer and request him to do his duty." He left the room. I heard him run up stairs, and in a few minutes he came in and laid on the table three 1*l.* notes. I said, "I want 5*l.* 10*s.* or take the consequence." "This is all I have just at present, but, if you will allow me a little more time, I will get the balance." I told him he should have ample time, and off he went again, and came back in a very short time and laid a sovereign on the top of the notes, making in all 4*l.*, and said this is all I have got. I then took out my watch and told him I would give him five minutes to hand out the balance. He now looked desperate, and said, "You must have patience" I replied, "The balance or take the consequence."

He again left the room. I heard him run for a candle, and rushed upstairs, and after a short time came down again; he then called the proprietor, and rushed out into the hall. Now, the proprietor, as I afterwards learned, was standing at the hall door talking to the officer, and, just as the learned doctor rushed out, the ordinary police patrol was just passing; seeing a brother chip standing at the door, came over and had a chat. So, when the doctor arrived at the door, he beheld a formidable array of the Royal Irish Constabulary, whom he thought were waiting for him.

He came into the room looking extremely pale and limp, and laid down the balance, three half-sovereigns, but where it came from I have not yet heard. However, I now had my 5*l.* 10*s.*, and was preparing to depart, when he said, "Of course, you will now destroy this warrant."

This looked serious for my friend, the "Red Seal," and taking it out of my pocket I said, rapping it gently on the table, "This is a legal document of great importance, and in our country must not be destroyed; but I give you my word of honour as a gentleman it shall not again be used against you." He seemed very grateful, and promised to call on me in the morning and give me one grand explanation.

I then wished him a very pleasant good evening.

Next morning I had a letter from this gentleman, saying he was sorry he had an engagement at nine o'clock, which would delay him some hours, but hoped to call later on.

At three o'clock I received a telegram from a friend staying at Blarney that my friend Doctor —— was leaving there by the 3.45 train, so that, no doubt, he had gone to get a lick of the celebrated stone to equip him for his future campaigns.

PS.—I have since heard that no less than four warrants have been applied for on his behalf.—*Cork Examiner.*

"A. P." JOTTINGS.*

Should any of you have made any special study of any one particular subject, I trust you will let us have the benefit of your experience next session, as only by that means can the general welfare of the Society be advanced. For my part, I have read a good deal in the papers of the advantages of taking to a certain line in photography and sticking to it, but I still remain a regular amateur—one who takes up each new process as it arrives, and following it up until another supersedes it. The advantages may be on the side of the former, but I think we all find photography more interesting in following the latter method. When I have been a few more years at it, perhaps I shall have weeded out the, to me, unsatisfactory processes, and find out which is really the best, but at present I must say I am uncertain. At the same time I must say that, so far, I limit myself to about three printing processes, instead of the six or seven I used to use. I find that with carbon, platinum, and matt-surface P.O.P., I can get fairly passable prints from any sort of negative. If the contrasts are too great for platinum, they are about right for carbon, and, should the negative be too thin for platinotype, it is generally right for silver. At one time, I must say, I revelled in the beautiful gloss of the ordinary P.O.P., but I am glad to say that the beauties of the matt style have quite converted me, and I now never use it. Carbon and platinotype are, in my opinion, the most artistic processes at present in use by amateurs, as the beautiful photogravure is as yet hardly within reach; but certainly, for warm tones, it is wonderful what can be done with matt P.O.P.; and, as I have so far put before you nothing new, I will give you the formula of my toning process. Simplicity is the one thing I aim at in it, and, as I do not much want the prints, except as proofs, I am not particular as to the permanency or otherwise of the prints, although, so far, I have seen no signs of their fading.

The ordinary process always seems to me most fatiguing. First, you must wash the prints, to get rid of the free silver, then place them in a bath of salt water, then wash, then in a bath of alum, again wash, then proceed to tone—tone to a certain colour, which, on drying, will, ten to one, be totally different to the tone you expect. After toning, wash again, and then place in the fixing bath and leave them, with constant shaking, for from fifteen to thirty minutes. Then wash for a couple of hours in constantly changing water. The result will probably be an unsatisfactory tone and a print anything but permanent. For my part, I put my prints direct from the printing frame into the toning bath; toning takes about half an hour; wash for an hour or two, and the tone is all that one could wish. The only fault is that I never seem to get any variation in the resulting tone, as they always finish the same tone, and that, to my idea, perfect. Well, the bath I use is the usual fixing bath, plus a grain or so of gold and a little carbonate of soda or ammonia to neutralise the acidity. If you have not tried this bath, I

* Continued from page 332.

would strongly recommend you to do so, as I think you will find it most simple and satisfactory. If I have not forgotten to bring them, I have here a few prints to show you, toned by this bath, and which have been knocking about for over six months. At the same time, if the negative is suitable, I should prefer having them in sepia carbon.

And now, gentlemen, there is one one more subject on which I should like to make a jotting, but it is a very dangerous one on which to venture. There seems to be a general impression abroad among some of you that my paper was to be on art. Well, you will see that so far you have been mistaken; but the last jotting I wish to inflict on you is on that dangerous subject. I take it that any paper that is read before a Society like ours is incomplete which does not touch on the artistic side of photography, as, whatever our individual aims may be, the aim of the Society as a whole is not technical, but artistic, work. That, I take it, is what we have always aimed at in our Exhibitions, and, I think, not altogether unsuccessfully; but, at the same time, there has always been room for improvement, and, though I do not pretend to teach you anything, yet, at the same time, as I have always made picture-making the prime aim and end of my experience, perhaps a few words may not be altogether without benefit, to me, if not to you. Well, then, how are we to set about getting pictures instead of mere photographs? Some will tell you that, so long as your photograph is like the original as it appeared at the time, it must be a picture, as nature is always beautiful. True, nature, as a whole, is beautiful; but then, unfortunately, you do not get a picture of the whole in your camera, but only a certain piece, which, as a part of the whole, may be beautiful, but is not so in itself. Take, for instance, river scenery. Nothing can be more beautiful than a piece of scenery with a river winding through it; but, if you take in your plate simply a square or oblong piece of the water without the banks and the trees, the result would be anything but beautiful. And so, again, with a view wherein appears a ruined abbey or castle, with mountains in the background, and perhaps water or cattle in the foreground. A very beautiful subject this would make; but, if you plant your camera down in front of the ruin, you will get a good architectural study perhaps, but the picturesque will probably be absent. Then, again, this same scene, which, in the early morning or late evening, may be beautiful, simply from its lighting, may, in the middle of the day, appear flat and uninteresting.

And this matter of lighting is, it seems to me, deserving of much more attention than we usually give it. The text-books always seem to me to give too much attention to the composition of a picture, and too little to the lighting. The composition always seems to me to bear the same relation to picture-making that grammar does to language. Once mastered, composition, like grammar, comes naturally, and, as in talking we are are not always thinking as to the correctness of our grammar, so in picture-making we need not always be thinking of the correctness of our composition. If we have properly mastered it, we shall not see that it is picturesque unless it is properly composed; whereas, if we always are looking to see that the balance is correct and the lines in the proper direction, ten to one we shall omit some more valuable point. Whereas, if the lighting is good and the composition is at fault, very often the beauty of the one will entirely eclipse the fault of the other.

LESLIE SELBY.

(To be continued.)

"TECHNICAL" EXAMINATIONS IN PHOTOGRAPHY.

THE examinations in photography conducted by the City and Guilds of London Institute were held on Wednesday, May 1, at various metropolitan and provincial centres. In the "Ordinary" grade the following paper, from which the candidate was to select seven questions to be answered, was set:—

1. Describe the theory and use of a sky-shade in outdoor photography.
2. Describe some of the different methods of obtaining vignetted heads or busts.
3. Give a general description of the process of retouching a portrait negative.
4. Describe the whole process of obtaining a print on any of the gelatino-chloride printing-out papers.
5. Describe what is implied by the term "fixed focus" when applied to the lens of a hand camera.
6. Give a design for a studio, with dark room attached, suitable for taking ordinary portraits.
7. How would you pose a man in ordinary costume with the view of obtaining a full-length portrait of him?
8. Describe the process for producing "tintypes" or "ferrotypes."
9. Why does the image, as seen on the ground glass of the camera, appear upside-down?
10. How would you proceed to obtain greater density if you found the trial negative of a batch showed a tendency to give general flatness?

The "Honours" grade of the City and Guilds Examination is divided into two sections, one being devoted to pure photography, and the other to photo-mechanical processes. In each section a practical examination is held in addition to the paper.

The following nine questions, of which the candidate was to select and answer six, constituted the written portion of the "Pure Photography" examination:—

1. Describe the different varieties of carbonate of soda that are met with in commerce, and discuss their relative uses in photography.
2. What is meant in photography by a "wide-angle lens?"
3. Describe "green fog," and state your opinion as to its causes, prevention, and cure.
4. Describe the different methods used for producing stereoscopic effects on the screen by means of the optical lantern.
5. Describe the "Diazotype" process.
6. Discuss the advantages and disadvantages of the use of the "swing back" as against that of the "rising front" where high buildings have to be included in the picture.
7. Describe the theory and construction of the tele-photographic lens.
8. Describe any method of after-treatment of a platinotype print that will convert the cold black tones into warmer or browner ones.
9. Describe the difference in composition between the ordinary albumenised silver paper and the printing-out gelatino-chloride papers, and discuss their relative advantages.

In the "Photo-mechanical Processes" section, the candidate had to select and answer eight of the following twelve questions:—

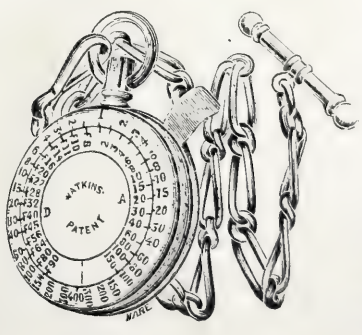
1. Describe the preparation of the transparency, and resist, for the carbon tissue transfer process.
2. How would you prepare the copper plate ready for etching by the same process?
3. How would you prepare the mordant for etching the copper plate? and explain the operations of etching it and re-etching it.
4. Describe the operation of making a negative for a "phototype block" from a wash drawing, explaining the differences produced in the negative by the use of variously shaped and sized stops, and the various distances between the screen and the sensitive plate.
5. Describe various methods of printing or transferring the half-tone picture on the metals, zinc and copper, giving formulæ of sensitive compounds.
6. Explain the etching of a copper plate on which the half-tone picture has been obtained by the enameline process. Give a formula of enameline.
7. Describe fully a process of photo-lithography in line by paper transfer.
8. Describe fully a process of photo-lithography in half-tone by paper transfer.
9. Describe the etching a zinc plate and its different states from the start till the greatest depth is obtained, and give a description of the rollers required and the formula of a soft or starting ink.
10. How would you prepare a collotype glass plate to be exposed to light under a negative?
11. A collotype glass plate having been printed under a negative, describe the operations which are necessary in order that such plate may be ready for printing; state what may be its defects and the way to remedy them. Give the formula of the etching liquid.
12. Describe the drying oven; state the effects of temperature on drying.

Our Editorial Table.

THE WATKINS' WATCH EXPOSURE METER.

THIS new outcome of the inventive ingenuity of Mr. Alfred Watkins is now being made and sold by Messrs. R. Field & Co., of 142 Suffolk-street, Birmingham. It is in watch form, having a chain attached, the face having engraved upon it the necessary arithmetical data for arriving at the essential factors of plate sensitiveness, diaphragm, and actinic force of light. The back of the instrument allows of a strip of sensitive paper being exposed against a standard tint. The following are the instructions for use:—

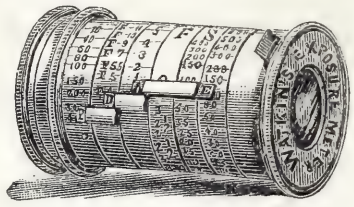
Hold the face of the actinometer to face *the source of the light which falls upon the subject, not to face the subject*, allowing the pendulum (cross bar downwards) to swing freely from the ring. Pull out a fresh surface of sensitive paper under the aperture, and at the same instant count "nought," continue counting "one, two," &c., in time with the swing of the pendulum (counting at one end of swing only for seconds.) The number of seconds taken for the paper to darken to the standard tint is the actinometer time, or A value.



To calculate the exposure consult the figured dial. Keep the

figure 1 to the top, set the diaphragm value D (on inner circle) against the plate speed (both figures being "same way up"), and then against the actinometer value, A, will be found the exposure on the outer scale. If the exposure thus indicated is to the right of 1, the figure represents whole seconds; if to the left of 1, fractions of a second, 2 being half, 10 being $\frac{1}{10}$, and so on. It will be noticed that, when the adjustment is once made for plate and diaphragm, the different exposures due to variations of light during the day can be read off without further adjustment of the instrument.

We have submitted the little instrument to a practical test, and can readily confirm the reliability of the data it furnishes for exposure.



The new Standard Meter is improved in the following respects:—The subject pointer is omitted (making one less pointer to set), but the subject scale is marked on final ring opposite exposure. For all ordinary subjects, therefore, the final pointer indicates the exposure, but for special subjects the exposure is found opposite the special subject value. The enlarging scale is also provided, but is never in the way if not wanted. The special enlarging meter is superseded by this, which is simpler in use than the old standard. Parts of a second are marked in vulgar (not decimal, as formerly) fractions, and cannot be mistaken for whole seconds. Reversible tint sent out with all refills. This provides a lighter tint, which allows the use of a larger stop, when the Watkins' method is followed, for interiors; but the light tint is kept out of sight when not required.

News and Notes.

MESSRS. R. HÜTTIG & SON, of Dresden, write: "We beg to inform you that we have appointed Messrs. L. Trapp & Co., 1, Budge-row, Cannon-street, London, E.C., our sole agents for the United Kingdom for the sale of our well-known cameras. Wholesale only."

THE Richmond Collotype Printing Company, of 18 and 19, Montpelier-road, Twickenham, S.W., is a newly established Company, formed to undertake the production of half-tone blocks and printing, collotype printing, and other varieties of photographic printing. Mr. Henry Berghoff is the Managing Director.

KIMBERLEY CAMERA CLUB.—The following are the honorary officers for 1895-6:—*President:* Mr. James Lawrence, M.L.A.—*Chairman:* Mr. Montague Thane.—*Vice-Chairman:* Mr. Frank H. Hancox.—*Council:* Mr. J. Childs, Rev. Father Ogle, Messrs. L. Atkinson, E. Goffe, and J. Henry.—*Lanternists:* Messrs. J. Childs, J. W. Lawrence, and F. H. Hancox.—*Curator and Librarian:* Mr. J. Imrie.—*Treasurer:* Mr. A. L. Franceys.—*Secretary:* Mr. Charles Howie, P.O. Box 233, Kimberley.

THE British Photographic Publishing Company inform us that, owing to the rapid growth of their business, it has been found necessary to move into larger premises, and that after May 31 their address will be: The British Photographic Publishing Company, Museum Studios, New Walk, Leicester. In addition to their business of view publishing and photo-mechanical printing, they are fitting up a showroom for the sale of photographic apparatus and material, and are specially laying themselves out to do the photographic material trade of the Midland counties.

MR. EADWEARD MUYBRIDGE announces that, during the season extending from October next until March, 1896, he proposes to give a series of lectures in Great Britain, on *The Motion of the Horse and other Animals in Nature and in Art*, illustrated with forty new zoopraxiscopic projecting discs. He has lectured upon, or given demonstrations of, the results of his investigations at nearly all the principal schools and institutions of science, art, or education, in Great Britain, in the United States, and on the continent of Europe, and he has recently returned from America with a series of forty new discs for use in the zoopraxiscope, none of which have yet been exhibited outside of his laboratory. These discs illustrate various continuous movements of horses, dogs, camels, elephants, buffaloes, kangaroos, and other animals, birds in the act of flying, and athletes running, jumping, turning somersaults, or engaged in other muscular exercises. After an analytical illustration of these movements, the consecutive phases thereof are projected—much larger than the size of life—in rapid succession on a screen, with the result of an apparent reproduction of the actual movement originally photographed from nature. The present will be virtually a repetition of the series of lectures given under the auspices of the United States Government Bureau of Education at the Columbian Exposition, and, although the training of the eye to a just appreciation of the movements of every-day life is their main object, they will be entirely free from technicalities; while the zoopraxiscopic demonstrations, although instructive to the scientist or the artist, are invariably a source of entertainment to the popular or juvenile audience. Mr. Muybridge's address is The Chestnuts, Kingston-on-Thames.

MR. WALTER TYLER'S ANNUAL RIVER TRIP.—On Friday, May 24 (the Queen's birthday), Mr. Walter Tyler, of Waterloo-road, held his annual river trip, inviting his staff and numerous friends, to the number of about 120, to partake of his hospitality. The party, which included many ladies, left Waterloo Station by specially provided saloon carriages, arriving at Windsor about eleven o'clock, where a large steam launch was in waiting to convey them to Marlow, which was reached after a pleasant little journey on a most beautiful stretch of the River Thames. A capital dinner was provided at the Greyhound, Marlow, the health of Mr. and Mrs. Tyler being drunk with very great enthusiasm. The opportunity was also taken of presenting Mr. Tyler with an illuminated address from those present, expressive of kindly sentiments, and tendering him good wishes in return for his hospitality. After dinner several photographic groups were taken, and the return journey was diversified by music and singing, Waterloo being ultimately reached at a late hour. The weather was of a delightful description, and the large party, for whose comfort and entertainment every possible provision had been generously made by Mr. Tyler, thoroughly enjoyed themselves.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 10,037.—"Improvements in Photographic Cameras." Complete Specification. F. HAARSTICK.—*Dated May*, 1895.

No. 10,098.—"An Improved Dish or Tray for the Development of Photographic Films." R. W. BUTTEMER.—*Dated May*, 1895.

No. 10,168.—"Improvements in and relating to Means for Carrying and Exposing Sensitive Photographic Dry Plates, Films, and the like." R. DOBSON.—*Dated May*, 1895.

No. 10,248.—"Improvements in Mechanical Rockers employed in Developing Photographic Negatives and performing like operations." J. B. BROOKS and J. HOLT.—*Dated May*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
3	North Middlesex	Excursion: Rochford.
3	South London	Excursion: Guildford. Leader, C. F. Dickinson.
4	Birmingham Photo. Society	
4	Brixton and Clapham	
4	Exeter	
4	Gospel Oak	Arrangement for First Outing.
4	Hackney	
4	Herefordshire	
4	Lewes	
4	North London	
4	Oxford Photo. Society	
4	Paisley	
4	Rochester	
4	Rotherham	
4	Sheffield Photo. Society	
4	York	
5	Edinburgh Photo. Society	
5	Leytonstone	
5	Photographic Club	*The Use of Coloured Screens in Photography, Commercial Isochromatic Screens and Plates and their Use.* E. J. Wall.
5	South London	*On the Early Work of the old South London Photographic Society.* Frank Howard.
5	Southsea	
6	Birmingham Photo. Society	
6	Glossop Dale	
6	Hull	
6	Leeds Photo. Society	
6	London and Provincial	*Photography: Past, Present, and Future.* W. Cobb.
6	Oldham	
6	Tunbridge Wells	
7	Brighton and Sussex	
7	Cardiff	
7	Croydon Microscopical	Conversational Meeting, and Results of Hartfield Excursion.
7	Holborn	
7	Leamington	
7	Maidstone	
7	North Kent	
8	Croydon Camera Club	Excursion: Pulborough, for Fittleworth. Leader, J. Smith.
8	Hull	
8	Liverpool Amateur	Excursion: Prenton, Storeton, to Heswall. Leader, Mr. Shone.

ROYAL PHOTOGRAPHIC SOCIETY.

MAY 28,—Technical Meeting,—Mr. Thomas Bedding in the chair.

Mr. BIRT ACRES read a paper on *Polychromatic Carbon Printing*. In the course of this he described two methods by which he had produced carbon prints in colours—the first by joining up the various parts of the picture pro-

duced on different coloured tissues, as, for an example, in the case of a print he showed, this consisting of a marine subject comprising sea, sky, and a yacht, each of these parts being printed separately, and joined. The second process, illustrated by an example which Mr. Acres exhibited at one of the recent Exhibitions of the Society, and now hanging in its meeting room, depended upon the principle of blocking out, the picture consisting of several superposed coloured carbon prints. A third process with which the lecturer had recently been experimenting was referred to. This necessitated the negative being taken on an orthochromatic plate through a suitable screen, and printed on a multiple film of polychromatic carbon tissue, black, green, red, yellow, and white pigments being employed. Mr. Acres stated that a coloured diagram had been reproduced by this method.

A short discussion followed, and Mr. Acres was accorded a vote of thanks for his paper.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

MAY 23,—Mr. E. J. Wall, F.R.P.S., in the chair.

Mr. W. T. Wilkinson passed round a half-tone negative on an Ilford ordinary plate; also prints from the block.

Examples of work produced by the aid of the bistigmat, apparently a symmetrical doublet lens, consisting of two simple or uncorrected elements, were shown.

Mr. R. CHILD BAYLEY read a paper on *Lippmann's Process of Colour Photography* [see page 342]. He subsequently sketched on the blackboard the arrangement he employed for projecting a photographiable spectrum. This consists of interposing a condenser in the path of the limelight, and then allowing the rays to traverse a slit, pass through a lens, and thence to a set of prisms.

Replying to Mr. Warnerke, Mr. BAYLEY said he orthochromatised the emulsion which he employed. There were fourteen grains of silver to six ounces of emulsion.

Mr. A. L. HENDERSON, in reference to Mr. Bayley's suggestion that rewetting the plates made the emulsion more granular, said that, when once the emulsion was set, it did not become more granular by rewetting. He alluded to the argentic stain he had introduced some years ago, which contained one grain of silver nitrate to the ounce of emulsion, and gave a very intense image.

The CHAIRMAN observed that the essential of success with Lippmann's method was to have as thin a film as possible. He quoted Neuhaus as alleging that the laminæ theory of the coloured image was incorrect, the colours being altered by rubbing.

Mr. BAYLEY said this was what he should expect.

Some discussion here took place between the Chairman and Mr. Bayley in reference to the formation of the coloured image, the former diagrammatically illustrating the action of the wave-lengths through the film, the latter appearing to favour the theory of the interference being due to an action between the top layer and the back of the film.

Mr. W. E. DEBENHAM suggested that the deposit alleged by Mr. Bayley to be a reproduction of the spectrum might be due to red and green fog.

The CHAIRMAN suggested that possibly the use of sulphuric acid in drying the mercury might lead to failure.

Mr. BAYLEY, in reply, said the grainlessness of the emulsion he employed was apparent in the microscope with a power of one-eighth. As regards Mr. Debenham's observation, Mr. Bayley affirmed that by daylight the true spectrum colours were visible. He did not think, in reply to the Chairman's observation, that any of the sulphuric acid was brought into contact with the mercury.

A vote of thanks was passed to Mr. Bayley.

PHOTOGRAPHIC CLUB.

MAY 22,—Mr. Wallis in the chair.

Mr. Foxlee showed a fossil exhibit. It was a glass positive, vignetted and coloured. He showed it because some had said they had not seen a vignetted glass positive. This one was made probably in the early fifties, and he should say it was vignetted in the camera.

It was agreed that it was a remarkably good specimen.

Upon taking the picture out of its case the following was found printed on the back:—"From Lane's old established portrait gallery, 213, Western-road, Brighton, and produced by the improved ambrotype process on plate glass. Prices, from 6*d.* to 10*s.* 6*d.* Taken daily from nine till dusk in any weather. Sunshine of no importance. Portraits can be much improved, and made to look more lifelike and natural, by being tinted or coloured, which can be done equally well after the picture has been put in case. The extra charge for tinting face and hands only is 6*d.*; for colouring the face, hands, dress, jewellery, &c., 1*s.*"

Mr. Frank Haes showed a compact lamp, made for travellers. He had adopted it for use in changing plates by putting a foot to it and a red fabric shade. Mr. Haes was then asked to give his demonstration of the Calotype process. He described the preparation of the paper, and then made several exposures. They were successful to a degree. The want of several changes of water and fixing naturally detracted from the result.

Mr. FOXLEE passed a few remarks on the process, also Mr. WILLIAMS; but it was so long ago since they used it that they could not say much upon the subject.

A vote of thanks was passed to Mr. Haes for the great trouble he had been to in preparing the demonstration.

Mr. FOXLEE said that Mr. Haes' remarks had reminded him of old times, for he had quite forgotten some part of the process, and also what photographers had to put up with in the old days. Before Mr. Haes had finished, his fingers any way showed what a mess they could get into.

Mr. TOTTEM drew attention to a press cutting, "All that was left of him." A strange story comes from Mulhouse, in Alsace. A chemical operator was blown by an explosion of nitro-benzole into a trough of sulphuric acid three feet deep. His whereabouts were only ascertained through the accidental discovery of two porcelain buttons and an indiarubber mouthpiece in the trough, everything else pertaining to the unlucky man having been dissolved. An electrical journal regrets that no attempt was made to restore the deceased by electro-deposition from the solution in which he was contained.

Croydon Camera Club.—On Wednesday, May 22, Mr. G. W. JENKINS, prefacing his demonstration with a *résumé* of the change brought about by the action of light on the tissue, demonstrated in successful fashion how the carbon-printing process is manipulated. In the discussion which followed, Mr. PACKHAM sketched the history of the process from Fox Talbot to Swan, and also, with some minuteness, explained how the so-called *papier velours* of Artigue is made and used, the "developer" being sawdust and water. He also drew attention to the "continuing action" of a damp atmosphere upon the undeveloped image of the ordinary carbon tissue, and spoke of the modifying powers available in the course of developing a carbon print. Messrs. White, Wratten, and Maclean also took part in the discussion, and, at the instance of the latter (President of the Club), Mr. Jenkins was given cordial thanks. During the evening Mr. J. Smith exhibited pairs of transparencies and of prints, prepared to illustrate the advantage of the Oakley anti-halation plate over other single-film ones. According to the examples shown, the plate should be a great boon to all who take interiors, or other views where there are great and sudden contrasts of light and shade, providing that in practical use there are no countervailing disadvantages. The President announced that the Royal Photographic Society had selected six of the Club's lantern slides for transmission to America with the special representative British set which is to be shown throughout the United States. The slides chosen were by Messrs. J. T. Sandell, A. E. Isaac, G. W. Jenkins, and G. Colden. In consequence of Derby Day falling on May 29, Mr. Woodcock's excursion is postponed from that date to June 12.

Croydon Microscopical and Natural History Club (Photographic Section).—On Friday, May 24, a paper was read before this Society by Mr. C. H. B. SPARROW on *A New Combined Toning and Fixing Bath*, and on *A New Printing-out Paper*, as follows:—The combined toning and fixing bath which I am bringing to your notice this evening is quite a new departure from the methods by which all those at present in general use are made. Although the composition of the bath is, at any rate at present, a secret, I may tell you that, while being a metallic toner, it does not owe its powers to lead, sulphur, or any of the usual messes of the average combined baths. It is, in fact, in no way a sulphur-toning process; and, from very severe and complete tests that have been made with it, it may be considered the most permanent form of metal toning yet suggested. The colours obtainable with it have a somewhat wide range, and the browns are the best, I think, that can be got, unless it be by Cowan's chrome alum and platinum bath, which, as you are all, I presume, aware, is a separate toning and fixing bath, which requires the toning to be stopped at an exact point, only to be ascertained by experience, to obtain a brown that will remain really brown when quite dry (I find so many prints, when trying to get a sepia brown colour, change after they have been dried, or in the course of a short time), but with this toner, as far as I have observed, this is not the case, no change taking place when the prints have been properly washed. Now, the first thing to be observed is that the toning is best carried out in good daylight. Directly the prints are placed in the toner, not only has the light no effect on them, but it (if not absolutely necessary) certainly improves the results. With a fresh bath it takes only from three to four minutes to complete the fixing and toning, and although this time seems very short to fix thoroughly, it is quite sufficient, provided the whites are cleared, and the prints on removal from the toning bath are at once put into running water, which stops all further toning action; and this is the great point to be observed, that the washing must be absolutely thorough, and also should be performed in running water (the prints should not be left to soak), for on the thoroughness of the washing depends the permanency of the print. The hardening action this bath has on gelatine papers renders the mounting of such papers much more easy than with the usual toning processes. It has also a remarkable freedom from producing double tones. The depth of printing required to obtain the brown tones should be about what is usual for the ordinary toning baths, but to obtain black or grey tones (for which two baths are better used, as the tone is obtained more quickly and certainly) it is necessary to over-print, as a considerable reduction takes place on placing the print in the second bath. The process for obtaining the black colours is that the prints must be thoroughly washed before placing in the first bath to get rid of all free silver, then drain them, and immerse in the second bath as in the process for brown tones; toning will proceed rapidly. At first they are, as you will presently see, of a dirty colour, but they soon tone up to a good black or grey while fixing at the same time; the action is finished in about five minutes, and then the prints must be washed as before in running water, and very thoroughly. I propose now, if agreeable to you, to tone two or three prints, just to go through the process. The prints I have here are some on gelatine papers (Ilford, Paget, and Otto) Mr. Baldock has kindly brought up; and the others of my own are on a new paper, which is prepared by a process quite different, I believe, to any other paper. It is a plain surface paper, without gloss of any sort, and, without doubt, of a much more permanent character than any silver paper that has yet been made, its peculiarity being that the image goes right into the paper, and if a toned print be soaked in hydrochloric acid, and the back rubbed off, you would very quickly come to the image, and this without loss of the slightest detail on the surface. I think you will find the picture as sharp and clear as it is on any gelatine paper, and probably agree with me in thinking the results in most cases more pleasing, and, shall we say, more artistic, than on the gelatine papers. It is easily dealt with, and does not require anything like the trouble and care of the glossy-surface papers. It is a good plan, in order to eliminate the fixing salt, to place the prints in very hot water (almost boiling) after a preliminary washing in water at the ordinary temperature. The best way to dry it is, after washing, to place it between

clean blotting-paper, press it, and then expose to the air; it never curls up, and, with care in blotting, does not stretch. It is very easy to wash in clouds or spot out any little defect with water colours. As a printing-out paper it appears to have distinct advantages, and will, I think, be found an advance on anything yet done in this direction. Both bath and paper have been, or very shortly will be, placed on the market by Messrs. Milne & Co., Ramsden-road, Balham, S.W. The members were much pleased, not only with the tones obtained, but also with the ease, facility, and certainty with which the different processes were carried out.

Hackney Photographic Society.—May 21, Mr. E. Puttock presiding.—After several announcements had been made, our new President (Mr. E. J. Wall) received an enthusiastic reception. In his address he gave a short history of photography up to the present date, and showed on the screen a series of slides illustrating its applicability to the following sciences and purposes; among others, astronomy, spectrum analysis, agriculture, botany, detection of crime, animal motion, geology, apiculture, ceramics, papyrus, archæology, microscope, &c. He strongly emphasised earnestness in work, the aim to be quality rather than quantity, and spoke in favour of taking up a special subject until completed. A hearty vote of thanks was passed unanimously.

North London Photographic Society.—May 21, Mr. Douglas in the chair.—Mr. A. E. Smith was elected a delegate to the Committee of Affiliated Societies in the place of Mr. Oakley, who had resigned. Mr. H. M. SMITH then lectured on *Enlarging*. To begin with, Mr. Smith said he wished to dissipate the idea which perhaps some of the members might have who had not attempted enlarging, that an elaborate and expensive apparatus was necessary for the process. If daylight is used, any small room (preferably one with the window to the north) could be temporarily made into the enlarging camera. A wooden shutter being made to fit against the window, cut a hole in it a little larger than the largest negative to be used, and fit in this a frame a few inches deep, with a piece of ground glass at the opening next the window, and, on the inside edges of the frame, top and bottom, make grooves to slide the negative in. Then, when negative is in position, film side towards the room, place an ordinary camera on a table opposite to the negative, with lens towards it, and with a bag of opaque material, open and fitted at both ends with elastic bands, enclose the space between the negative and lens by putting one band round the negative frame and the other round the lens. The ground glass of the camera is folded back, and a board or easel to hold the sensitive paper is placed behind it at a distance regulated by the size of the enlargement required. The focussing is done by racking or moving the camera backwards or forwards on the table. If the window has not a clear look-out, a reflector, which might be a board covered with white paper, should be placed outside at an angle of 45°. To test exposure, a strip of the sensitive paper is fixed in the easel, and, masking three-fourths of it, expose; then draw mask back to the half for an equal time, and so on. You then have four different exposures—the last four times as great as the first. Then develop. This test can be done in a very few minutes. Mr. Smith then explained how to print in clouds where necessary from separate negatives, and gave hints on development during the time he developed two 15×12 prints he had brought with him. In the discussion afterwards, Mr. SLATER said that, in enlarging by artificial light, he now used a lantern with an albo-carbon gaslight, the burner being a No. 2 Bray's, as he found in using the limelight the exposure was so short that it was difficult to prevent over-exposure, a second or two making a great difference. By the gaslight it took minutes instead of seconds. Mr. BISHOP said Mr. Slater worked the limelight too strong. He (Mr. Bishop) used the light very weak—such a light, for instance, as would be quite useless for showing lantern slides on the screen. A hearty vote of thanks was given to Mr. Smith for his lecture.

South London Photographic Society.—May 20.—Mr. W. H. BARNES gave a lecture on *Isochromatic Plates—their Use and How to Work them.* Mr. Barnes began his remarks by giving the history of these plates. He said it was believed that these plates did not retain their colour-sensitiveness for any length of time, but he could assure them this was entirely wrong, and submitted samples of work supporting his statement. In copying pictures in oil, whether new or old, it is necessary to use a screen. This could be placed in front, between, or at the back of the lens, and, if of glass, should be optically worked on its surface. They could also be had made of gelatine. In landscape work the screen was not necessary, but could be used with advantage for great brilliancy, and when atmospheric effects were not so much required. He advised to develop with only half the usual quantity of pyro, as the plates readily gave the required density. Photographs taken on ordinary and isochromatic plates, with and without a screen, in various subjects, were shown for comparison, with the result of the isochromatic plates coming in first. Lantern slides were also shown ably by the Society's Hon. Lanternist, Mr. J. T. French, adding further to the opinion already expressed. A vote of thanks to Mr. Barnes for his exhaustive lecture closed the meeting. Members are requested to please note that the Whitsun excursion to Guildford will be a good one, and if they intend to attend should write the Hon. Assistant Secretary at once.

Streatham Photographic Society.—At the General Meeting of the Society, held at 14, Greyhound-lane on Wednesday, the 15th inst., the following gentlemen were nominated:—Messrs. J. E. Negus, J. W. Poole, F. W. Stone, H. G. Field, A. G. Coombs, G. H. Taylor, — West, E. W. West, J. Barley, and G. Comins. The PRESIDENT (Dr. Hull) impressed upon all those present that their individual efforts were of the utmost importance to the growth of the Society, which, up to the present is so great a success. *Re* Rule IV., the subscription was fixed at 2*s.* 6*d.* for the present, and a scale of charges for printing photographs was submitted and approved. It was agreed that several publications should be purchased for the use of members. All communications concerning the Society should be addressed to the Hon. Secretary, Mr. J. J. Laws, chemist, 14, Greyhound-lane.

FORTHCOMING EXHIBITION.

1895.		
June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

EXTEMPORISED PLATE MAKING.

To the EDITOR.

SIR,—Referring to your leading article in last week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY upon the subject of *Extemporised Dry-plate Making*, and more particularly to the last paragraph, I, for one, should be only too glad to meet any demand there might be for gelatine emulsions, provided, of course, that there was a sufficient inquiry to make the matter of commercial value.

I have myself repeatedly experienced the disadvantage of being unable to purchase one or two plates of large or unusual dimensions, and also the frequent loss due to the want of a "test plate" of identical speed and quality. Given a suitable emulsion, any photographer should easily prepare such plates for his own requirements, and, even if he were not quite so dexterous in coating the glass as he might be, the balance of advantage would still be in his favour.

I propose in an early issue of your JOURNAL to announce the prices and speeds of the emulsions which I shall be prepared to supply, and, if your readers or yourselves have any further suggestions to offer, I shall give them careful consideration.—I am, yours, &c.,

12, *South-villas, Camden-square, London, N.W.* S. HERBERT FRY.

THE LAW ON "ARTISTS' STUDIES."

To the EDITOR.

SIR,—Freely as I congratulate Mr. Gambier Bolton upon the outcome of his action against Mr. Cecil Aldin, I cannot but think that the law as laid down by Mr. Justice Grantham is likely to have consequences by no means beneficial to photographers at large.

Although, according to your report, a circular issued by Mr. Bolton contained a list of studies described as "invaluable to artists," the Judge held that no purchaser was at liberty to copy them; nor can I find that he qualified this dictum by saying that any part of an artist's study might be copied.

If, on the strength of this judgment, artists risk being made liable for penalties and damages every time they paint in a sky, tree, or building, in part or whole, founded upon a photographic artist's study, a serious blow will be struck at an important industry which has given employment to hundreds, and which, if not paralysed by laws more beneficial to the few than to the many, is likely to become still more flourishing.

Pending any revision in the law, may I suggest that a convenient course to pursue would be for those concerned to plainly stamp upon each print "Artist's study; any part of this print may be copied *by hand.*"

Not one in a thousand of ordinary artists' studies are of any value as pictures or illustrations, and there is no temptation for any one to pirate them; none the less, every artist would resent being obliged to paint with one eye to his subject and the other on the photographs, or he may be lying in wait to floor him with a copyright act.

Such a system, if generally adopted, would lend additional force to any claims made against a pirate who, stealing photographic works of value, would not be able to plead extenuation that he imagined the photograph to be an "artist's study."—I am, yours, &c., HECTOR MACLEAN.

Croydon, May 25, 1895.

PHOTOGRAPHIC COPYRIGHT *VERSUS* BLACK AND WHITE PIRACY.

To the EDITOR.

SIR,—My attention has only just been called to the report and comments in your issue of the 17th, on the important copyright decision in the case of Gambier Bolton *v.* Cecil Aldin and others, tried in the Court of Queen's Bench on the 11th inst.

Having acted as the solicitor for Mr. Gambier Bolton in this action, and also for Mr. Franz Hanfstaengl in the litigation arising out of the "Living Picture" representations at the Empire Theatre, on which I had occasion to write to you some time since, I think it right to point out that the great importance of Mr. Bolton's victory in the present case arises from its having clearly distinguished the decision in the House of

Lords with reference to sketches of the "Living Pictures" which appeared in the *Daily Graphic* from the more common cases of direct copying, whether from a picture or photograph, which are now declared to be in no sense permitted piracies, notwithstanding that they may not reproduce all the features of the original work.

This is a matter of vital importance to all who are concerned in the protection of the rights of copyright owners, and it deserves to be emphasised quite as much as the achievement which will be, perhaps, most popular with Mr. Bolton's fellow photographers, namely, the vindication of photographic copyright over piracy in "black and white," whether in illustrated journals or in any other form.—I am, yours, &c.,

Corporation-chambers, Guildhall-yard, HERBERT BENTWITCH.
London, E.C., May 28, 1895.

MONOCOCYL . . . . PHTALEIN.

To the EDITOR.

SIR,—As I read Mr. Webster's letter *re* Dr. Morway and his orthochromatising solutions, I half wondered whether it was the letter I had *proposed* to write, for in almost every detail it is such as I would and could have written, *i.e.*, as far as my own experience is concerned. Being somewhat incredulous as to the *bonâ fide* of this *doctor*, I ventured to write Captain Abney, who disclaimed any knowledge of him! but doubtless the good Captain will himself be writing you. I enclose two papers with some caligraphy intended to explain the use and composition of this desideratum.

In the interests of photography or of fair play, I think it is only right that Dr. Morway should be "better known."

I may say that I have only tried the solution once, and with a tolerably satisfactory result; I have been too busy to experiment further, but will try to do so this week.

Awaiting further information through your columns,—I am, yours, &c., W. A. WHISTON, F.C.S.

Llandudno.

To the EDITOR.

SIR,—In this week's issue, May 24, I observe a short article entitled, "An Episode," by Mr. G. Watmough Webster, F.C.S., giving an interesting interview between Mr. Webster and a person styling himself Doctor Morway. This man (Doctor Morway) is, without doubt, the same person who has just been released from a prison in Glasgow after undergoing six months' imprisonment for stealing platinum from our works. Besides stealing the platinum from us, he has swindled and taken in a great many persons in Glasgow, Edinburgh, and Dundee, by his plausible manner and general intelligence. My only object in writing this is for Mr. Webster's benefit, and, if possible, to prevent any other photographers from being swindled.

I may add we have samples here of the chemical compound he sold to Mr. Webster, but we know nothing of its virtue.—I am, yours, &c.,

JOHN HUNTER.

Dalmarnock Iron Works, Baltic-street, Bridgeton, Glasgow, May 27, 1895.

P.S.—The Doctor has a mark on one side of his face. It is of a purple colour, and he said it was caused by an explosion. J. H.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

To the EDITOR.

SIR,—Mr. W. S. Bird is very emphatic in his letter on the apathy that the Photographers' Benevolent Association has to suffer, but I would, before the Association is finally wound up, ask for another trial to awaken some interest in it, as I am quite sure that, if it is once again put on a proper basis, it will flourish as of yore, and to this end I have again engaged a room at the White Swan, Tudor-street, Whitefriars (enter at the grill room entrance), for Tuesday evening, June 11, at 8 p.m. I will stay till 10.30 p.m., and I hope that I shall have no occasion to regret the step. As there must be many photographers who are not aware of any circumstances to justify my action in thus calling such a meeting, I should like to make a short statement, which will, I hope, set at rest any doubts as to my position. Over twenty-two years ago, after frequent suggestions that such a society should be formed, I called a meeting (in much the same terms as the above notice) at my house in Brixton, and from that meeting the Photographers' Benevolent Association sprang. I was Secretary till 1876, when I went abroad, and until just lately have been away from London, and consequently not able to take any active part in the Association. The starting of the Association cost me nearly 100*l.*, and I feel that I am quite justified in making some effort to keep it from extinction. I have no cut-and-dried scheme to present to the meeting, but wish for those who attend to discuss ways and means; but I have one scheme in my mind that I should like to give some notice of, and that is the feasibility of establishing in connexion with the Photographers' Benevolent Association an Assistants' Photographic Society on the same lines as the Royal Photographic Society, the London and Provincial, and the general run of photographic societies, so that assistants can meet together and discuss photographic methods, see new processes demonstrated, and thus stand on an equal footing with the professional and amateur members of the above-named club. If such a society could be formed, I would do my best to help in any way, and can promise the services of many who are well-known experts in all branches; but, unless I get the necessary aid for this and for the Photographers' Benevolent Association, assistants must remain in an isolated position, strangers to each other and to the profession at large.

As we have many ladies in our ranks, I should be glad of their presence, as well as that of the other sex.

In conclusion, I may say that I am aware the time of year is a bad one for indoor meetings, but the matter is urgent, and I have put the hour of meeting as late as 8 p.m. so as to give ample time for all to arrive; but, if this is not late enough for some, please don't let that keep any away, because the meeting is sure to last till 10.30 p.m. The White Swan is easily reached from Fleet-street and from Bridge-street, Blackfriars, and is a high-class hotel, with a splendid meeting-room, kindly placed at my disposal by Mr. Pim at the instance of an amateur photographer.—I am, yours, &c., W. T. WILKINSON.

P.S.—I may mention that I have received from many of my old colleagues letters of sympathy with my attempt at resuscitating the Photographers' Benevolent Association, notably one from Mr. Ashman, who was the first to arrive at the original first meeting, and who took an active part in the management until from business reasons he left London.

SUMMER PHOTOGRAPHIC EXHIBITION AT THE AGRICULTURAL HALL.

To the EDITOR.

SIR,—To issue rules and conditions that provoke neither comment nor question is beyond the power and foresight of the average Exhibition manager or secretary. We must put that down as an accepted condition of things. There is one point connected with the above Exhibition that I should like to settle in some easier fashion than writing individually to each querist, and by the insertion of this note you will probably help me in this direction. The "special competitions" are defined as "open to amateur photographers who have not previously received a medal or prize at a Photographic Exhibition," and I stick closely to the wording of the rule. The usual question is concerned with competitions organised by the press, photographic and general. I do not consider any such competition a "Photographic Exhibition," and prize-winnners in these are perfectly eligible to compete at the Summer Photographic Exhibition.—I am, yours, &c.,

WALTER D. WELFORD, *General Manager,*
59 *and* 60, *Chancery-lane, London, W.C., May* 27, 1895.

AQUARIUM ANNUAL PHOTOGRAPHIC EXHIBITION.

To the EDITOR.

SIR,—Will you allow me to inform your readers, through the medium of your columns, that it has been decided to hold the above Exhibition from about July 11 to August 14 next. The exhibitors will be thus brought into contact with the country people in town for the season, the Londoners before they go for their holidays, and the American and foreign visitors of whom large numbers are expected this summer. I would draw, moreover, especial attention to the Amateur and Professional Competitions, for which medals and diplomas will be given, and for which *no entrance fee* will be charged to members of recognised Photographic Societies.—I am, sir, yours, &c., E. A. DU PLAT.

Westminster, London, S.W., May 27, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges of Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange half-plate burnisher for good interior background; difference in cash.—Address, W. J. BENNETTS, Beacon, Camborne.

Will exchange bar burnisher (condition as new) and other accessories, for large size grass mat.—Address, Baldwin's Studio, Bath.

Will exchange print washer, to wash about fifty half-plate prints, for half-plate lens or half-plate camera, without lens or slides.—Address, J. SIDDALL, Foundry-street, Dewsbury.

One 12×10 book dark slide, one 12×10 double block dark slide never been used, and one cabinet burnisher, will give in exchange for rustic furniture or landscape background.—Address, E. GREGSON, "Ground Floor" Studio, Bedford Cottage, Lister-lane, Halifax.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

T. ROMER.—Methylated spirit, if free from the mineral spirit, will do quite well.

H. B. HARRIS.—The formulæ are quite right; the iron salt is the reducing agent in each case.

J. W. W.—Write and explain your difficulty to the makers of the paper. They will probably be able to elucidate the cause of your trouble better than we can.

WATER.—The apparatus will doubtless answer very well. There are washers constructed on the same principle in the market, we believe. Similar ones have from time to time been described in the JOURNAL.

SUBSCRIBER (Carmarthen).—If you took the portrait of the gentleman in the ordinary course of business, as we judge from the letter you did, you are not entitled to any copyright in it. Why should you be?

C. X. Y.—We are sorry, good friend, to have incurred your strictures; but to have dealt with the matter in any other way than we have done would have given an exaggerated idea of its value or interest.

W. P. C.—The question, "Why do photographs fade?" is far too vague a one to attempt to answer in this column. There are dozens of causes of the fading of silver prints, and dozens of other conditions that may be conducive to them.

C. R. E.—"Can you tell me if the Platinotype Company's developing salts can be used for the Autotype Company's platinotype printing paper?"—In reply: We cannot say, as we have not had an opportunity of using the Autotype Company's paper.

W. BULLOCH.—While the general idea is similar to the other, there are features of difference in the way in which it is carried out. Your patent agent will, doubtless, advise you that these differences will afford ground for securing protection for them.

R. JENNINGS.—If the lens is a symmetrical one, that is the two combination are identical, it will not matter whether the back or the front is next the negative to be enlarged. A table of distances for different size enlargements will be found in the ALMANAC.

T. C. BRADY.—We fancy you will find it more economical to purchase oxalate of potash than to make it. However, its manufacture is a very simple matter. It is merely to neutralise a solution of oxalic acid with carbonate of potash and crystallise. For photographic purposes it is not necessary to crystallise if tolerably pure materials are used to begin with.

DAVIDSON & SONS.—If the firm have not a price-list—we believe they have, however—write to Messrs. Winstone & Son, Shoe-lane, or to Herr Romain Talbot, Berlin. The former supplies presses, rollers, &c., and the latter every requisite necessary for collotype. We are surprised, however, that the firm named did not supply you with a catalogue, as they profess to supply all necessaries.

H. H. GREGORY says: "Could you give me addresses of the best photographic journals that are published in France and Germany, and fees for advertising for situation in same?"—In reply: France: *L'Amateur Photographe*, 21, Boulevard St. Germain, Paris; *Moniteur de la Photographie*, 7, Rue Scheffer, Paris. Germany: *Deutsche Photographen-Zeitung*, Weimar; *Photographische Mittheilungen*, Berlin. We do not know the advertising rates.

BARR MAT asks: "If I take a photograph of a well-known personage free gratis, and supply him with copies for nothing, do I hold the copyright of that photograph? If so, in the event of an illustrated paper reproducing the said photograph, could I claim damages? Is it necessary to mark all such photographs copyright?"—The copyright, under such circumstances, is your property. You will not be able to obtain damages or penalties unless the copyright is registered.

R. DE VERA (Nice) says: "I am taking some pictures on a Continental tour which I wish to publish in England and other countries. Will you please tell me how I can make them copyright in England and other Continental countries?"—Under the International Copyright Convention, if a picture be made copyright, in the country of its origin, according to the copyright law of that country, the work becomes also copyright in all other countries that were signatories to the Convention.

D. MCNIEL.—If the print-seller is selling bromide prints for platinotypes, he is liable to prosecution under the false trades description law. That he does not produce them himself is of little moment. He is still liable to penalties. Any one can institute the prosecution.

FADED.—The yellowness in faded albumenised prints is, in many instances, removed by treatment with bichloride of mercury. Try the following experiment on any print of no use, but which has faded to an equal extent as the one you wish to copy:—Remove it from the mount by immersion in tepid water; clean the back, so as to remove all the paste, then immerse in a solution of bichloride of mercury until the yellowness has disappeared. If this is successful, you have encouragement to treat the other in a similar manner.

A. F. COE writes: "Please let us know the reason of enclosed. It has only been in our window fourteen days in a frame, made on our own sensitised albumen paper (the best), and mounts supplied by Messrs. Kotch & Friedlander from a Berlin manufactory. Is it the colour of mount? All that we place in our window go likewise in a few days. We have very little sun on it, and a blind down. You will greatly oblige."—The reason is this: the colour used for tinting the albumen is fugitive when exposed to light, and, as it fades, it leaves the unpleasant yellow tint complained of behind.

W. R. F. writes: "1. Some twelve months ago I saw in your JOURNAL a remedy for photographs coming off the mounts, as per sample enclosed. I did not take much notice of it at the time, but the last lot of mounts unfortunately recalls it. Should be glad if you could inform me of a remedy. 2. Also, we often have to make negatives for amateurs' own printing from prints which are most probably copyright. If we only make *negatives*, and *not* prints, should we be responsible in any way for prints made by those negatives?"—1. We do not know what mountant was employed, but judging from the print, when moistened, it has very little adhesive properties. Try a thin solution of gelatine, such as that referred to a week or two ago. 2. Certainly you will be liable if you pirate copyright works by copying them.

E. B. D. writes: "My studio is in the garden some little distance from the house. I am now putting up a building which will connect it with the house, and my next-door neighbour is threatening me with all manner of things for stopping what he calls his 'ancient lights.' The houses have both been built for forty years, or more, but the present owner has only had his house for five or six years, and I have occupied mine for longer. I am told that the so-called 'ancient light right' must be enjoyed for twenty years to acquire it; what, then, can this man do who has only had the house for a few years?"—He can stop your erection if it interferes with his light. If his windows have had an uninterrupted light for twenty years, *they* have acquired the right which the owner can protect, however short may have been his ownership of them.

G. G. B. writes: "For some time past I have been troubled by rapid discolouration or stains in clouds upon silver photographs. I changed three different firms of albumenised paper; I changed blotting-paper of every kind and description, and always the same result. I here enclose you a *carte-de-visite* to enable you to clearly see the fading or stains on it. I have others mounted on a very plain mount, without any bronze or printing of any description, and they show even more quickly than on the one here enclosed. To me they seem clearly to be hypo spots, but my printer says it is impossible. He says that, after the hypo dish, he washes them in five or six waters in another dish, and thence to another clean dish in a rapid current of water for an hour, and after that they remain all night in a slow current of water; in the morning they are supposed to be again left in a rapid current for another hour, and then dried or mounted, as the need may be, but, as a rule, they are mounted there and then. I know that my printer won't filter his silver bath; he does it if I am there, but not otherwise. He doesn't see the use of it. Many and many a time, when the prints are in the washing dish, and, as I hold them up, the water seems to run off in strips, as if the paper is full of grease, and if there are any blisters, which I am sorry to say there are many, they all seem to repel with great rapidity the water. Now, whether this is the cause, or whether the last washing dish is dirty at the bottom—I don't know of any other cause. Can you assist me in any way out of the difficulty?"—If our correspondent, who seems to be a practical photographer, and sees the work done, cannot detect the source of the trouble, we certainly cannot, unless we were present when it was carried out. If *laches* on the part of the printer are observed, they can be altered. Want of the filtration of the sensitising bath is *not* the cause of the fading, that is certain. The prolonged washing, or rather soaking, of the print is by no means conducive to stability.

CONTENTS.

	Page
CRUCIAL FOCUSSING BY EYEPIECES.	337
GOLD SULPHIDE AND SULPHOCYANIDES	338
WANT OF HOMOGENEITY IN DRY-PLATE FILMS	338
THE LATE B. J. SAYCE	340
B. J. SAYCE. By W. B. BOLTON	340
THE EXHIBITION OF THE PARIS PHOTO CLUB, WITH SOME REMARKS UPON THE POSITION OF PICTORIAL PHOTOGRAPHY IN FRANCE. By ALFRED MASKELL	341
LIPPMANN'S PROCESS OF COLOUR PHOTOGRAPHY. By R. CHILD BAYLEY	342
SOFTNESS OF DEFINITION. By J. K. TULLOCH, M.B.	343
PHOTOGRAPHS—GOOD *VERSUS* BAD. By TECHNIQUE	344
"AUTO, ORTHO, CHROMATIC"	345
"A. P." JOTTINGS. By LESLIE SELBY	346
"TECHNICAL" EXAMINATIONS IN PHOTOGRAPHY	347
OUR EDITORIAL TABLE	347
NEWS AND NOTES	348
RECENT PATENTS	348
MEETINGS OF SOCIETIES	348
FORTHCOMING EXHIBITION	350
CORRESPONDENCE	350
EXCHANGE COLUMN	351
ANSWERS TO CORRESPONDENTS	352

THE BRITISH

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THE INVENTION OF EMULSION PHOTOGRAPHY.

The true inception of emulsion photography does not appear to be quite so well known, especially to contributors to some Liverpool journals, as would be desirable in the interests of historical accuracy.

From a provincial paper recently received, in which the lamented death of B. J. Sayce is commented on, the writer evidently believes that emulsion photography was unknown prior to the publication of the experiments of Sayce and Bolton in 1864, and dreams are indulged in as to the fortune that might have accrued had a patent been taken for the discovery, instead of its having been given as a present to the world.

The emulsification of the sensitive ingredients was, doubtless, a natural, as it has proved a useful, idea, but it would not have formed a subject for a patent, at any rate not at the time of the Sayce and Bolton introduction of it, and this for the good and sufficient reason, that a patent for emulsion photography had already been applied for, by another, three years anterior.

It was in 1861 that Captain Henry Dixon, having conceived the same idea, obtained provisional protection for what was entitled "Improvements in Photography," these improvements consisting in mixing together in collodion those ingredients which go towards the making of a negative. Dixon's invention, as specified, consisted in mixing nitrate of silver with previously iodised collodion or other coating medium prepared in the usual manner. He stated that the mode ordinarily practised for coating plates with collodion or other coating medium had been first to pour the prepared (bromo-iodised) collodion on the plate and then to immerse it in a nitrate of silver bath to coat it with silver. But in this invention the silver bath is dispensed with by mixing the silver with the collodion or other coating medium, so that, after coating the plate with this mixture, all that is necessary is to rinse the plate to remove "greasiness," after which it is ready for exposure. By this invention, said Captain Dixon, the numerous objections attending the use of a nitrate of silver bath are entirely dispensed with and the process rendered more certain, convenient, and considerably less expensive than heretofore.

In the face of this publication it will be seen that it would have been difficult for the gentlemen, afterwards accredited with the introduction of emulsion photography, to obtain a patent for such introduction had they been disposed to have applied for the same. From the fact that Captain Dixon allowed his patent to lapse, we imagine one of two things; he either did not succeed to his satisfaction in carrying it out, or, having thus established his priority of invention, he at once presented his idea to the public as a basis for further improving upon the invention. That others subsequently did improve upon it the experiments and improved formulæ of Sayce and Bolton attest.

Whether arising from the Dixon idea or not we cannot tell, but it is certain that M. Alexis Gaudin of *La Lumière*, in or about 1863, wrote that he had invented two kinds of emulsions which he termed "photogènes," one of which he applied to glass by which to take negatives, and the other to paper for positive printing. This latter, we may observe, is the collodio-chloride emulsion of the present period. Soon after its invention by Gaudin, the late Mr. Wharton Simpson read a paper on it at the Photographic Society, and by thus publicly introducing it into England was accredited with being its inventor.

From the foregoing it will be seen how difficult it would have been rendered to sustain any patent for the later application of Messrs. Sayce and Bolton.

Gelatine is a recognisably different substance from collodion, and we are not aware of any one having sought to obtain a patent for its application as, what Captain Dixon calls, a coating medium; but, had such an application been made, there seems little doubt that Dixon's previous publication would have seriously interfered with the even tenor of its way.

It need scarcely be said that these remarks are not made for the sake of detracting in the very slightest degree from the merit we have invariably bestowed upon the introducers of collodio-bromide, and which they so well deserve from their patient experimenting and skill in having brought the process into a state more satisfactory and workable than any emulsion process which preceded it.

GELATINE EMULSION FOR THE LIPPMANN COLOUR PROCESS.

Mr. R. Child Bayley's interesting paper on the above process will, no doubt, be the means of inducing others to experiment in a direction which unquestionably offers a wide field for research, and at the same time presents features of novelty that cannot fail to prove attractive to those of an experimental turn; and, as so much importance is attached to the character of the emulsion necessary to ensure success, we propose to offer a few remarks on the subject.

The principal requirement appears to be extreme fineness of division and freedom from grain in the emulsion, and, as a matter of necessity in securing this, other qualities such as sensitiveness have to take a secondary position, although we presume that a higher degree of rapidity than that mentioned in connexion with the Lumière formula will not prove objectionable if the primary quality is attained at the same time. It follows also, as a matter of course, that the process followed must in any case be entirely different from that usually adopted for ordinary negative work, and also that it must be a comparatively roundabout one.

That the process of MM. Lumière is calculated to give an emulsion of the highest possible degree of fineness is undeniable, but that it is calculated also to afford the greatest excellence from a physical or mechanical point of view is open to very grave question. The hardening of the film immediately after settling by means of alcohol, and the subsequent washing to remove the soluble salts, for instance, leave much room for improvement, and open up many chances of more or less mechanical injury to a film of such extreme attenuation and delicacy as that mentioned in Mr. Child Bayley's paper; in fact, it seems in every way desirable, if it can be brought about without the introduction of appreciable granularity, that the emulsion should be washed before application to the glass, and also, if necessary, orthochromatised—in other words, that it may dry immediately after coating.

We may here allude to a point or points on which we are scarcely in full accordance with Mr. Bayley, namely, the absolute necessity, on the one hand, for coating the plate immediately after mixing the emulsion, and also his statement that rewetting the film tends to introduce granularity. With so small a quantity of silver bromide present, and such an extremely minute excess of soluble bromide—about one grain in five ounces of emulsion—there is very little chance of the ripening process going on with such rapidity as to bring the bromide to the blue or granular stage during the period occupied in preparing and washing the emulsion, more particularly if the temperature given by him is adhered to. But, even if there were, the ripening may be dispensed with and the emulsion allowed to set at once, for Mr. A. L. Henderson is undoubtedly correct in his statement that in the jellied state the particles of silver haloid undergo no further change. It follows also that rewetting can scarcely have any effect in causing a change in that direction, though it is very possible that the film may be rendered less homogeneous simply by the action of the water or alcohol on the gelatine itself; that, in fact, in the case of a soft gelatine, portions of it may become partially decomposed during drying, and so rendered liable to solution when rewetted even with cold water.

There seems no valid reason, therefore, why an emulsion prepared by this formula should not be washed in the ordinary way, though, possibly, MM. Lumière, who are careful enough experimentalists, may have good reason for adopting the plan they have recommended. But it may be further urged that the washed emulsion itself would undergo granularity after it was remelted. This is quite contrary to our experience of many years with gelatine emulsions, and, we believe, of others, unless, indeed, the preparation is submitted to, and kept at, a temperature far higher than any that is usually employed. In the presence of soluble salts, especially bromide or any form of alkali, the ripening process—the passage from fineness to granularity—goes on more or less rapidly at all temperatures so long as the emulsion remains in the liquid state, the change naturally taking place more quickly at a high than at a low temperature, and in proportion to the softness of the gelatine and the thinness of the solution. But, after the removal of the soluble matter, the state of fineness is practically fixed, and the only effect of keeping the emulsion liquid, at least at an ordinary temperature, such as that mentioned in the paper, is to permit the gradual deposition of the silver bromide. Indeed, in past years when we had more to do with gelatine emulsions than at present, we have often collected the silver bromide deposited from a decomposed and permanently liquid emulsion, and after washing in warm water, re-emulsified it with fresh gelatine. With an emulsion such as MM. Lumières', containing so small a proportion of bromide—and that in such a fine state of division—to the full ordinary strength of gelatine, we scarcely think any subsidence would be possible.

However, there are other and, we think, equally simple methods by which an extremely fine emulsion may be made, and which will possess a higher degree of rapidity than that used by Mr. Bayley, at the same time requiring no washing after the film has set upon the glass. Monckhoven's process, published in 1879, which dispensed with washing altogether, is perhaps not applicable to this process, besides presenting features of difficulty that prevented its general adoption. But probably a modification of it would be found serviceable in the production of extremely transparent films. In this process precipitated and washed silver carbonate was incorporated with warm gelatine solution, in which, after a short time, it emulsified perfectly, or, at least, assumed a sufficiently fine state of division for all ordinary purposes. To the emulsified carbonate was then added sufficient hydrobromic acid to exactly displace the carbonic acid and convert the silver into bromide, when a still finer state of division was produced, though not perhaps sufficiently fine for our present purpose; and after keeping the emulsion at a temperature about equal to that given by Mr. Bayley for a few hours, to allow the carbonic acid to escape, the emulsion was ready for use without further treatment except filtering.

The modification that we would suggest in this process—though that is scarcely the correct term, since it practically transforms it into an entirely new one, the only original feature retained being the conversion of the emulsified carbonate—consists in substituting hydrochloric for hydrobromic acid to form a chloride emulsion, which, after setting, is treated with bromide of potassium to form bromide of silver, after which it is washed in the ordinary way. The substitution of hydrochloric for hydrobromic acid removes one of the difficulties of Monckhoven's method, since one is an easily obtained article of commerce of known strength, the other difficult to obtain and very unstable; while the final washing of the emulsion obviates the principal difficulty, namely, the exact conversion of the carbonate, as a slight excess of acid is of no moment whatever. But the principal reason for the use of hydrochloric acid and the formation of a chloride emulsion is that the latter haloid forms both in collodion and gelatine under similar conditions in an infinitely finer state than bromide; and, when in the jelly state, the emulsion is treated with a soluble bromide, the conversion takes place with comparatively little alteration in the fineness of the particles—we say comparatively little because molecule for molecule those of silver bromide are larger than those of chloride, and, consequently, there must be a slight coarsening. Even allowing for this, a much finer emulsion of bromide can be produced under similar conditions as to temperature and strength by the conversion process than is possible

by the direct method. We employed this plan years ago for the production for experimental purposes of a pure iodide of silver emulsion of a degree of fineness not otherwise attainable.

It may be asked why we resort to the carbonate method instead of forming the silver chloride direct from a soluble chloride and silver nitrate. The object is to secure the very highest degree of fineness attainable, and this, we think, the carbonate process does. If the silver carbonate by a short digestion at as low a temperature as possible, for it discolours slightly if too much heat be used, be reduced to a moderately fine condition, so as not to exhibit any appreciable granularity, the action of the hydrochloric acid and the evolution of carbonic acid gas break it up into a still finer state—so fine, indeed, that in tolerably considerable volume the emulsion is almost transparent, and when spread upon glass is perfectly so, and after drying nearly invisible. We speak now of emulsions containing the ordinary quantity of silver; but with a preparation like that of MM. Lumière, containing as it does less than three grains of silver nitrate to the ounce of emulsion and the full strength of gelatine, we can conceive that it would be quite transparent, and, even after conversion into bromide, present the appearance mentioned by Mr. Bayley.

If the fine chloride emulsion so prepared be allowed to set thoroughly and be then squeezed through coarse canvas into a weak solution of potassium bromide, the conversion into bromide will take place in a very short time; but it is advisable to allow sufficient time to ensure the total displacement of the chlorine, as any chloride of silver remaining unchanged might possibly interfere with the colour effects. If the bromide solution be used sufficiently weak, there will be no danger of dissolving out the bromide of silver formed if the action be allowed to continue for an hour or two; but it is not desirable to use it too strong in order to hasten the conversion. The conversion should be effected in the manner directed, after the emulsion has set, rather than by adding the bromide to the warm emulsion itself, as in the latter circumstances there would be an undoubted coarsening; indeed, that plan would present no advantages over the direct way of mixing.

Another plan we have often used for the purpose of forming an extremely fine emulsion consists in utilising the solvent action of liquid ammonia upon silver chloride or carbonate, and this has the further advantage of giving a higher degree of sensitiveness than the other, as the haloid is formed in the presence of free alkali instead of free acid. The action of free ammonia or other alkali in a bromide emulsion tends, as we have already pointed out, in the direction of granularity; but in this case it will be seen that the silver bromide is not formed until the emulsion has reached the solid state, and is therefore unaffected by the alkali if it be still present, while up to that stage the chloride or carbonate is in actual solution.

If to an emulsion of carbonate or chloride of silver made as above, or to one of chloride made simply by incorporating washed chloride of silver with warm gelatine, strong ammonia be added drop by drop, the silver salt will be dissolved and the emulsion become perfectly transparent and of a pale yellow brown colour, in which state the fineness is, of course, the highest it is possible to attain. The quantity of ammonia required to effect this result is extremely small with chloride emulsion of ordinary strength, two, or at the outside three, drops suffice; but, with one containing no more silver than that described, the quantity could be much reduced if necessary. This emulsion, when spread on glass, allowed to set, and freely exposed to the atmosphere, gives off its ammonia, and the chloride or carbonate of silver is precipitated, but in such a fine state of division that the film remains, even at full strength, quite transparent and absolutely free from grain. If a drop of solution of bromide of potassium be dropped on the surface, the colour and density are, of course, changed by the formation of silver bromide, but the transparency remains, and the plate may be washed in very cold water and dried without losing any of that quality.

The presence of so small a quantity of ammonia has not the slightest effect on the setting of the gelatine; this may be allowed to take place and the emulsion squeezed into solution of bromide and subsequently washed in the ordinary way, except that for the present purpose it is desirable to use soft or distilled water. When washed and redissolved, it is scarcely likely any change in the condition of fineness will occur, and the emulsion may be either orthochromatised or used as it stands.

THE ACTION OF LIGHT ON COLOURS.

At a recent meeting of the Society of Arts, Captain Abney read an interesting paper entitled, *Means for Mitigating the Fading of Pigments* (see page 361). It will be remembered that Captain Abney, in conjunction with Dr. Russell, some years ago was appointed to investigate the cause of the fading of colours. In the report they rendered it is stated that all pigments are permanent when exposed to light, provided they be in *vacuo;* also, that the rays which prove the most destructive are the blue and the violet. That is quite what might be expected by photographers. The plan proposed for mitigating the fading now is to glaze the skylights of picture galleries with a mixture of blue-green and yellow glass, the light from this having also to pass, before it gets into the room, through corrugated white glass, which serves to diffuse and mix the coloured light. It is found that such a light, though not actually white, is nearly so, does not materially interfere with the colours of the pictures, while a large proportion of the more chemically active rays which do the mischief are filtered out.

In the discussion which followed the reading of the paper reference was made to the influence the vehicle with which the pigments were mixed had, as well as to the material to which they are applied. Pictures, for example, that are painted in oil colour are, as a rule, more permanent than are those in water colour, although the same pigments are used in each case. Some makes of paper also have been found to have a marked deleterious effect on certain pigments. Again, it may be mentioned, some dyes are permanent when applied to woollen stuffs, but they are far from being so on silk or cotton goods. Notably is this the case with some of the brilliant colours of the coal-tar series.

The permanence of pigments is perhaps of less direct interest to photographers now than it was formerly, for little is done with coloured photographs at the present time as compared with what was done some years ago. Indeed, few photographers now make a speciality of coloured work as they did in former times, and we have a pretty strong idea that those who do pay very little attention to the permanence, or otherwise, of the pigments that are used. The same may also be said of those who supply the colours. Brilliancy of the colours, in some instances, now seems to be of greater importance than their stability. Indeed, it is sometimes questioned if the pigments used by some of the old masters were not more

permanent than are corresponding ones of modern make, and whether the latter a century or two hence will prove as stable as those used in olden times?

Carbon prints cannot, in the strict sense of the term, be classed as permanent pictures if the tissue is made with fugitive pigments. Some of our older readers will remember the brilliant purple tissues that were used by the workers of the Lambert process, in which cochineal lake was largely used, and how the pictures changed in tint with a few months' exposure in show cases. It was this alteration in tint, by the action of light, that led to the abandonment of cochineal colours by the leading manufacturers of carbon tissue. So far as the carbon process is now concerned, the pigments employed may, to all intents and purposes, be considered as quite stable. That, we fear, cannot be said of some of the inks used in the mechanical processes, such as collotype, for example, particularly those printed in imitation of silver photographs, and especially those used in chromo-collotype, both here and on the Continent.

Colour printing, generally, receives but little consideration as regards the stability of the pigments employed, as witness the coloured prints issued by many of the illustrated papers. After only a week or two's exposure on a railway book-stall, even in winter, they often suffer a marked deterioration through the fading of some of the colours. Speaking on this subject, a little while ago, to the principal of one of the largest colour-printing establishments in the metropolis, he told us it was not their fault, their customers would have the most brilliant colours obtainable, regardless of their want of stability, and, if his firm did not supply them, other firms would. The manufacturers of the inks also vie with each other in the brilliance of the colours they produce, though the majority of them make no secret of the fact that many of them are of a very unstable character when exposed to a strong light. In these days of keen competition, who is to blame?

Turning from the fading of coloured pictures to photographs, what do we find? Silver prints, nowadays, are fugitive enough, goodness knows, but they have, in a sense, been made more so during the last few years for a similar reason to that just referred to—demand and supply. Photographers demand a tinted paper for their pictures, instead of white, and they are supplied with it. Some use the paper with the full knowledge that the tint is highly fugitive, while others employ it in ignorance of the fact. The latter often attribute the fading of the tint to fading of the photograph itself. Only last week a professional photographer wrote asking the reason why all his prints, when put into the window, faded in a few days. The reason was simply this, the albumenised paper was tinted with a fugitive colour—apparently one of the coal-tar series, and the strong light had discharged the colour, and left a disagreeable yellow stain behind that was highly suggestive of a fading silver print. The image itself was unaffected, except for the yellowness left by the faded colouring matter of the albumen.

A School for Process Work.—The following paragraph appears in the report of the Technical Education Board which has just been presented to the London County Council:—"(*c*) *Photographic School.*—The establishment of a school of practical photography as applied to the various reproductive processes, some of which have of late years almost taken the place of wood-engraving, and which include photo-lithography, collotype, photogravure, half-tone etching, Meisenbach blocks, photo-chrome, &c., has been receiving the very serious attention of the Board. It seems that some if these processes are carried to a much higher degree of perfection in Vienna, Paris, and Berlin than in London, and that in those cases on which London firms have been successful in competing with Continental houses many of the skilled workmen are foreigners. Several applications have been made to the Technical Education Board by wood-engravers and photographers for assistance to enable them to obtain practical instruction in some of the above-named processes, and it is probable that, by maintaining a really first-class school of 'process work,' the Board would be able to exert an immediate and direct effect on an important industry, and to benefit a large class of skilled workers. The Board has accordingly consulted Captain W. de W. Abney, C.B., F.R.S., and other experts, with a view to ascertaining the best method of procedure, in order to maintain an efficient school of practical photography, and the reports which have been submitted are receiving the very careful attention of the Board. The chief difficulties lie in the scarcity of suitable teachers, and in the great expense which an efficient school carrying out all the above branches of work would involve; but, if the school were successful in attaining its object, a very large annual outlay would be well expended."

The Illustrated Press and Photographic Copyright.—We cull the following choice bit of dialogue from an interview with Mr. Reichardt, Editor of *St. Paul's*, which recently appeared in the *Publishers' Circular*:—"'There has, I understand, been some amount of friction between publishers of illustrated papers and photographers. Has that been your experience, Mr. Reichardt?' 'Certainly; it is a most important question which must sooner or later be solved. There ought, I think, to be a Publishers' Union established as an offset to the Photographers' Union. No publisher objects to paying a fair price for photographs which are the copyright of the photographer, *but in ninety-nine cases out of a hundred such copyright does not exist, and illegal fees are demanded, which are often paid merely to save bother.* A photographer appears to me like a man who has sold a horse, and, whenever the purchaser desires to lend it to a friend, would exact a guinea for allowing him to do so. The most effectual way of defeating these men is to have nothing to do with them.' 'How would you manage that?' 'I would not use any of their copyright photographs, and, when the copyright is not theirs, I would use them without acknowledging them. I had an instance some time ago when I reproduced in *St. Paul's* the portraits of about thirty-four of Her Majesty's Judges. One of the photographers demanded a fee, but when I told him that he had better be careful, as their lordships knew something about the copyright law, I heard no more of it.'" Mr. Reichardt's statement, which we have printed in italics, is surely, to say the least of it, an exaggeration, and the whole thing bears such a grotesque aspect that we are in doubt as to whether he has been correctly represented. What do our readers think of it, especially after the case of Gambier Bolton *versus* Aldin? We fancy they will say, as we say without a moment's hesitation, that Mr. Reichardt has only a vague idea of what copyright is, and that, in the matter of "illegality," to judge by proofs, he has placed the boot on the wrong foot with a vengeance.

The Royal Photographic Society's Exhibition Catalogue.—This year will see the inauguration of a new departure in the character of the catalogue of the Royal Photographic Society's (forthcoming) Exhibition. The catalogue is to be illustrated by reproductions of many of the photographs that will be placed on the walls. Between forty and fifty of the photographs will probably be selected for illustrative purposes, and we are assured that the reproductions which will be both in line and half-tone, will do justice to the processes, and be in every way worthy of the Society. The result should be a handsome volume, highly useful for reference in future years, and of great educational value to all photographers. Moreover, the possibility of having one's work reproduced in permanent form should be not only an incentive to send in exhibits, but also an inducement to pay the closest and most assiduous attention to the artistic and technical qualities of that work.

The Convention.—On another page we are enabled to give the programme of the week's excursions which will be held during the Shrewsbury meeting of the Convention, which begins on Monday, July 15 next. It will be seen that a tempting programme has been prepared, and the officials are to be congratulated on having collated a number of interesting archæological notes in reference to the places to be visited, which will, doubtless, be photographically much appreciated by the excursionists.

The Royal Photographic Society's New Premises.—The new premises, which the recent growth of the Society have rendered necessary, are situated at No. 12, Hanover-square. The ordinary meeting on June 11 will be held there, when Professor W. C. Roberts-Austen, C.B., F.R.S., will read a paper on *The Recording of High Temperatures by Photographic Means*, and Captain Abney one *On Orthochromatics*.

THE CHANGES THAT PLATINUM PRINTS ARE LIABLE TO.

[Royal Photographic Society.]

In January, 1887 (*Photographic News*, xxxi. 39), I made a few experiments in connexion with the alleged fading of platinum prints, and stated that, as ordinarily prepared, they were darkened and yellowed by exposure to sulphuretted hydrogen, and that, though the original appearance of the print could not be restored by hydrochloric acid, chlorine water was effective for this purpose, without injury to the colour or depth of the image. I mention this early reference to the matter because, since that time, the use of chlorine water has been recommended more than once, as if its use for this purpose were a new idea, and it might have been thought that I was following up the suggestions of others.

My attention was again forcibly directed to this subject in November last by the kindness of Mr. Ralph Robinson, who sent me an exceedingly fine example of the apparent fading of a platinum print. A few weeks after this, in an article in *Photography* (vi. 818), I asked that any one who had platinum prints that had apparently faded, or were otherwise changed in appearance, would, if possible, favour me with them for experimental purposes, but to this appeal I received no reply. I conclude, therefore, that changed platinum prints are comparatively rare, and this agrees with my own experience and that of many others.

The questions that naturally need answering in this matter are: What is it that changes? How does it change? Can the original colour be restored? and, Is the real permanency of the print involved? I think I can answer these questions satisfactorily, and show that the platinum image is not affected, and that the original colour can be restored without injury to the photograph.

Mr. Robinson's print was produced by the usual procedure on the ordinary hot-bath paper nine or ten years ago. To all appearance, the image itself has changed to a yellowish brown, and, on unmounting a part, it is clear that the paper of the print is discoloured right through. But the effect is not a mere staining of the paper; the image itself is brown, while it was black. The print was mounted on a very common board, which has darkened considerably where not covered with the print, and the colour of the mount is so similar to that of the print that one might suspect the change in both to be due to a similar source, and I believe that this is so to a large extent.

The print was easily unmounted by soaking in cold water. It was obviously necessary to use *small* pieces for the various tests, but in every case the examination for each constituent was done more than once, and generally by different methods. The print contains iron, and gave evidence of the presence of a very little sulphur—in combination, of course. The mount appeared to contain more iron than the print; it certainly contained more sulphur, and some of this sulphur was in a form that allowed of its volatilisation by boiling with hydrochloric acid. An aqueous extract of the mount decolourised potassium permanganate and iodide of starch solutions; with hydrochloric acid it appeared to go slightly turbid on standing, it became slightly turbid with mercurous nitrate, and with silver nitrate it soon became brown. These reactions point to the presence of sulphur compounds other than sulphates. Silver was tested for, but not found.

These results indicate that the change of colour is probably due at least partly to iron compounds. I found that potassium acid oxalate in saturated solution had little effect even when the print was soaked in it for one hour. Hydrochloric acid was better, but was not effectual even when persevered with, and chlorine water was perhaps a little better still, but even it did not fully restore the print. A mixture of dilute hydrochloric acid and chlorine water was quite successful; in a few minutes it entirely got rid of the brownish tint, and gave a pure black image. The mount was partly bleached by hydrochloric acid, but chlorine water coloured it to a reddish tint.

Thus it appears that the change in the print is due at least partly to the iron it contains having been acted on by sulphur compounds, probably sulphuretted hydrogen, evolved from the common mounting board used. I find that platinum prints are darkened by sulphuretted hydrogen, and that hydrochloric acid has only a little effect upon the darkened print, while a mixture of acid and chlorine restores the original colour. I made several experiments to see whether chlorine might be safely used for this purpose without the risk of losing anything from the detail or strength of the high lights. An old print showed no sign of being affected. A recent print was soaked for one hour, while ten minutes is more than sufficient to restore any print I have experimented with, but without the slightest apparent effect. A sepia print, after one hour's treatment, showed evidence in one part of being slightly affected, but only in one small part, and so slightly that one could not say positively that there was any change at all. Other prints were treated for three hours without obvious change.

I would recommend, for the restoring of discoloured or apparently faded platinum prints, to soak them in hydrochloric acid mixed with about ten times its bulk of water, or more, and to which has been added a few drops of sodium hypochlorite solution, enough to give a distinct odour of chlorine, and in daylight to show the colour of chlorine in the liquid. After five or ten minutes the prints should be well washed and dried as usual.

We have often been told that if platinum prints change or discolour it is because they have not been thoroughly washed, and that iron has been allowed to remain in them. Now, it is common knowledge that iron stains are difficult to remove from paper or linen, and I find that it is practically impossible to get rid of the iron from platinum prints. After washing an unexposed piece of platinum paper for four hours in dilute hydrochloric acid (1–60), that is one hour after it ceased to be possible to detect the removal of iron from it, and finally washing it for one hour in distilled water, the paper still contained iron; it was browned by sulphuretted hydrogen, and after browning was bleached by hydrochloric acid and chlorine, but not by acid alone. A piece of paper coated with ferric oxalate only, after washing in dilute hydrochloric acid for four or five hours and then for one hour in distilled water, was found to contain iron. Nor does the chlorine treatment confer immunity from change by sulphuretted hydrogen, for prints that have been browned by it and then bleached and washed are apparently as readily affected by it again as at first. Thus iron remains after prolonged washing in unexposed paper, and, as might be expected, there is rather more where the iron salt has been reduced by exposure. In three different prints I took equal areas of the dark shadows and of the lighter parts, and found more iron in the darker parts than in the lighter. The amounts of iron were small, but, in order to make sure of this difference, I asked a person who knew nothing of the work to inspect each pair of reactions, and he confirmed my own observations. The iron being to a certain extent proportional to the depth of colour of the image would appear to account for, or at least to partly account for, the browning by sulphuretted hydrogen being more marked in the deeper shadows than in the lights, and the appearance of a change throughout the image.

Having found that iron is always present in platinum prints, I sought further proof that it is competent to produce the effects I have ascribed to it by treating paper coated with the iron salt alone. For this purpose I used some kindly furnished me by Mr. E. J. Humphery, of the Platinotye Company, and also some prepared by myself. In both cases, after prolonged washing with acid, iron remained, and the colouration by sulphuretted hydrogen was produced on the coated side of the paper as before; but, if paper is coated with potassium platinous chloride alone, dried and washed, platinum compounds remain apparently fixed in the paper, and will brown with sulphuretted hydrogen, and may be bleached again with chlorine though not with hydrochloric acid. Platinum compounds may therefore occasionally have something to do with the changes produced.

In a certain sense it would be true to say that the image of a platinum print consists of metallic platinum and some iron compounds, but, as the amount of iron is so small in a properly prepared print, I think this statement, without qualification, would be deceptive. Still the iron is there, and can be proved in many ways.

Of the methods recently introduced for toning platinum prints we can distinguish two kinds. In the one a solution is employed that is on the verge of depositing some tinctorial body, and the mere disturbance introduced by the particles of the image is sufficient to determine the change, and so the deposition takes place on the image

and is probably roughly proportional to its density. This principle of action is old and well known, and may be illustrated by the redevelopment or silver intensification of collodion plates. The deposition of gold by Mr. Dollond's process, toning with uranium, and the deposition of staining matter from oxidised and darkened alkaline developer solutions appear to belong to this class. But Mr. Packham's method of using a solution of catechu appears on the face of it to be radically different from these methods, although many have confused it with them. The solution used is colourless, it does not become coloured, it does not yield a deposit on standing, and it is not unstable. In this case we have nothing more, I believe, than the catechu reacting with the iron present in the print and producing the characteristic colour of the compound of these two substances.

When the catechu* solution is allowed to act on ferric oxide or is mixed with ferric chloride, a brown compound results. Dilute hydrochloric acid acting on this changes it to a lighter tint, but does not appear to remove any iron from it. Sodium carbonate turns it red and dissolves it either partly or wholly. Similar changes can be produced by these reagents in toned platinum prints. Sodium carbonate first reddens the image, and on prolonging the action the colour is partly removed. These reactions cannot be produced with catechu alone, that is without the iron. The amount of iron present affects the colour produced. I prepared a hot bath print, and treated parts of it to various amounts of washing with acid. The first strip was in one acid bath for two or three minutes, and then washed in tap water. The next had two baths during ten minutes, the next three baths for thirty minutes, the following was treated to several changes of acid during one and a half hours, and all these were washed in tap water. The last strip but one probably represents the ordinary treatment of prints, and the last such treatment as a very careful and patient worker might occasionally employ. But, even after treating with acid for one and a half hours and then washing, the amount of iron present is not reduced to its minimum, as I have proved in several ways, and this colour test with catechu also shows it. By washing in acid for three hours and then in distilled water the whole of the removable iron does seem to be got away, as treatment with stronger acid (1–10) for one hour more produced no perceptible effect. The whole print when dry was then soaked in a cold catechu bath for four hours and washed. The colour of each strip is different except that the last two are alike, the alteration of colour being less as the previous acid treatment was prolonged, and the part that had four hours' treatment with acid shows the reactions of the iron catechu compound. The various statements as to the occasional superiority of stale paper and of certain additions to the developer, the difference between old and new developers, and all analogous observations can now be understood, they resolve themselves probably entirely into methods for varying the amount of iron left in the print, some perhaps causing a greater or less proportion of iron to remain in the shadows than in the lights.

It follows, if the above is correct, that unexposed platinum paper after prolonged washing with acid should be tinted by the catechu, as I have already shown that some iron remains even under these conditions. I find this is the case, the brown tint produced being very obvious when compared with the original paper. The red colour that catechu gives with pure paper, by somewhat prolonging the action, must not be confused with the brown iron compound first produced. It also follows that other substances than catechu which give coloured iron compounds may be used for toning platinum prints, and this too is confirmed by experiment. A tannic acid solution of the same strength as the catechu solution gives much the same effect but a rather colder tone. Gallic acid solution of the same strength intensifies the print, but affects its colour very slightly. These results are exactly what would be expected.

The practical application of the facts given in this paper are so obvious that it is hardly necessary to refer to them. How to prevent the changing of prints, and to safely restore those that have changed; how to control the colour when toning with catechu; how, with the same reagent, to give a red colour to a part or the whole of the paper of a print; these and some other matters may be left as they stand. But the possibility of acting on the iron present to vary the print is a very wide subject, which Mr. Packham has unwittingly been the first to take advantage of. Some of the iron compounds that can be produced are of great stability. Though I would not venture to say that they rival platinum itself, yet they do rival in permanency some of the pigments used in carbon printing, and leave silver prints, however toned, very far behind. But, if advantage is to be taken of the iron for toning purposes, discretion must be used, and I hope that no one would dream of being so foolish as to adopt any one of the almost innumerable methods that are, doubtless, possible, however fascinating it may be, until it had been found satisfactorily permanent after a proper and sufficient scientific examination.

CHAPMAN JONES, F.I.C., F.C.S.

* Mr. Packham kindly supplied me with some of his preparation.

DISCUSSION.

Captain W. de W. Abney was glad that Mr. Chapman Jones was satisfied that the platinum image was absolutely permanent. He had himself had a great many prints which had darkened in much the same way as the print by Mr. Ralph Robinson which Mr. Jones had shown, and all he could say upon that point was that this result would always follow careless washing or washing in certain kinds of water. As a rule, prints which had yellowed could be restored by hydrochloric acid, to which Mr. Chapman Jones had said there must be added sufficient hypochlorite of lime to make the solution smell of chlorine. One was inclined to avoid the use of hypochlorite of lime, if possible; the quantity recommended was, however, very small, and could do no serious harm. Silver prints used to be toned with the hypochlorite, and it had no bad effect upon the paper as paper. He was surprised to find that, after the most careful washing, it was impossible to get rid of all the iron; and he thought Mr. Jones had admirably explained the so-called toning action of various substances which had recently been brought forward. For his own part, he regarded the action of these substances as one of staining rather than toning; true toning consists of a deposition, probably of a metal, and he would as soon dip a print in the coffee-pot as "tone" with catechu, and his advice was, Leave such methods of "toning" alone.

The President did not see why one should not stain if staining produced a good result.

Mr. J. Packham thanked Mr. Chapman Jones for the light he had thrown on the subject; he had for the past few years been experimenting considerably in the direction of the toning of platinum prints, and had met with much that was puzzling, but Mr. Jones's paper had opened up fresh fields for investigation. He thought that Captain Abney treated somewhat too lightly the method of toning with catechu which he (Mr. Packham) had introduced; he did not claim great things for the process, but simply the discovery that it was possible to get a combination, or a semi-combination, of organic matter with the platinum forming a photographic image. The subject was almost as old as the world, and was an operation of dyeing rather than of staining; the ancients were particularly successful in producing designs and patterns by the deposition of organic matter upon metallic bases.

Mr. J. Weir Brown said the change of colour by catechu appeared to be dependent on the iron, and not upon the platinum. Captain Abney had referred to certain processes as staining processes; did that remark apply to the toning of silver prints with uranium?

Captain Abney said certainly not; in that case there was a chemical change.

Mr. Weir Brown said he had not succeeded in making any desirable change in platinum prints by means of uranium; but in the silver print there was a chemical change, and the process could not be considered staining.

Captain Abney said he had not referred to silver prints.

Mr. E. Cecil Hertslet asked Captain Abney how it was, if the process of toning with uranium or with ferridcyanide of iron was purely a staining process, that the high lights of the prints—the skies, for instance—remained perfectly pure?

Captain Abney could not admit that that was the case.

Mr. Hertslet showed prints toned with uranium and with ferridcyanide of iron, and contended that the action was only on the platinum of the image, and that there was no staining of the high lights; he also pointed out certain indications in the prints to prove that there was intensification as well as toning.

Mr. H. W. Bennett said that a print treated with catechu, according to Mr. Packham's process, returned to its original colour on exposure to strong sunlight, a fact which indicated that that process was one of staining and not of toning.

Mr. Sebastian Davis said a toning process should ordinarily be understood to refer to cases where there was a chemical substitution of a certain substance for the salt acted upon by light, as in an albumen print in which there was a substitution of gold for the reduced silver.

Mr. W. Thomas said there was uncertainty as to the colour obtained in the use of sepia platinotype paper, and it was a matter of importance that some means should be found for varying the cold tone of the platinum print. In his experience the uranium and iron toning or staining processes had given results which had stood the test of time under ordinary conditions. He did not see how the alteration of the colour of a platinotype print, from black to brown or red, could be properly described as a stain, inasmuch as the solution employed was green in colour, and, in combination with the

black deposit, produced red or brown tones, and, when a change from black to blue was desired, a red solution was used. He would have thought that staining would be where the print was changed to the colour of the solution, as when coffee was used.

The Assistant Secretary referred to Mr. Bennett's remark that the catechu method was a staining process because it was not permanent, and pointed out that, if non-permanence were the characteristic of staining processes, then the ordinary gold toning of a silver print, which was a notoriously fleeting thing, was staining.

Mr. Bennett said his remark applied only to the reversion of the print to its original colour. There was no fading of the image itself; the "tone" or "stain" was discharged, leaving the print practically uninjured and unchanged.

Captain Abney said one of Mr. Hertslet's uranium prints, in which the whites remained pure, was at present a mystery to him; it was the best uranium-toned print he had ever seen. He did not think the prints showed intensification, but only such action as he should have expected uranium to have. He was perfectly certain that, if the uranium were removed, the original platinum image would be seen; there was consequently no substitution and no true toning.

Mr. Hertslet was not quite sure that that followed. If the print were put into a strong alkaline solution, the colour would be discharged; but he believed it might be framed and hung up for an indefinite period without alteration.

Captain Abney said he did not endorse the idea that, because the print faded, therefore the action was only a staining. Mr. Chapman Jones seemed to have answered the question as to why the colour was given, and one would expect that there would be more iron left in the dark than in the whites, and therefore there would be a substitution of uranium for the iron, but not for the platinum.

Mr. Hertslet: Although the expression, "toning," may not be quite correct, will you not admit that, as the paper remains white, the action is not one of staining?

Captain Abney: But, in one of the prints, the whites have not remained pure; the other is a mystery which I cannot understand yet.

Mr. Hertslet said the negative from which one of the prints was made was a thin one, and the sky had printed through to a slight extent and taken up a little of the uranium.

Captain Abney said there was a difference between the formation of a lake and a mere stain. When he first read of Mr. Packham's process, he thought a true lake might be formed, but it was apparently not a lake formed with the platinum, but with the impurity left in the paper.

Mr. Chapman Jones considered that the distinction between staining and toning should be that staining referred to the paper and toning to the image. He did not know whether coffee would affect the image or the paper, but he should imagine the latter.

Captain Abney said it affected both.

Mr. Chapman Jones said solutions of tannic acid, gallic acid, or catechu, did not stain the paper, except that, with prolonged treatment, catechu produced a red stain. He thought the effects obtained with catechu and similar substances were not exactly due to the formation of a lake, but to the combination of the colouring matter with the iron. There should be a distinction between a staining solution and a solution which in itself has no colour. With regard to the permanency of uranium-toned prints, they might be permanent, just as silver prints might be permanent, but they could not be guaranteed. The iron compound of catechu he thought more likely to be permanent. With regard to the character of the change in uranium toning, he thought it was certainly due to a deposition upon the image, and not to a compound formed with it. It was a decomposition, just as gold was deposited by Mr. Dollond's method. This view was borne out by the fact that, if ammonium sulphocyanide was added to the solution, toning took place in a very short time, owing to the introduction of the reducing agent. The action was apparently analogous to the intensification or redevelopment of a wet-collodion plate. The added product could be removed without affecting the original, and whether that should be called intensification, or staining, or toning, was perhaps a matter of choice, but he was inclined to call it toning and intensification.

"A. P." JOTTINGS.*

And then, again, how we may improve our ideas when we come to the development and printing of our subject. A little more or less density in development, a little more or less of mistiness in the print may make all the difference between a photograph and a work of art. And it is here that we may study the much-discussed question of focus and out of focus. Unfortunately, those in favour of sharp prints will see no beauty in a fuzzy print, and those in favour of fuzziness can see no beauty in a sharp print; but, if you will look at this question, as I always try to do, from an impartial point of view, I think you will see that you may gain much from following both schools. Certain subjects undoubtedly look better when sharp; but then, again, how much some views are improved by being a little out of focus.

Some workers, I know, go to extremes, and so far, I must say, I have not been able to live up to the work of, say, Mr. Roland Briant; but, in time, I may do so, and will therefore not say that they are altogether to be objected to. In studying this subject I think we should always remember that at present photography is in its infancy, and has not as yet been able to dispense with its swaddling clothes; so, as Whistler was at one time much derided by artists, and is now looked up to and admired, so it may be with the Maskells and Briants of photography in the future. At any rate, I think we all owe a great debt of gratitude to the original founder of this theory, who, I believe, was once a member of our Society—Dr. P. H. Emerson. Some of you, I know, cannot see the beauty in a fuzzy print that the Doctor saw; but, if you will give a certain time to the study of his pictures, and try to find out his aim in them, in time you will find much more than a mere photograph would give; and, as we now have in our library some of his works, I trust that some of you who have not already seen them will take an early opportunity of doing so. At any rate, by so doing you will disabuse your minds of one idea that seems to be pretty generally prevalent, viz., that all his pictures were out of focus. Some of them are as sharp as the lens will take them, others are sharp in the foreground and fuzzy in the distance, while others will be slightly out of focus altogether. And it is here that all of us who try to make pictures will, I think, learn so much. Learn, that is, that much more can be got out of a lens than tho mere sharpist will allow. He is confined to one focus of his lens, the sharpest; but we, by allowing ourselves to use three or four different degrees of focus, can get so many more effects with the same lens. Why one should be tied down to the use of a lens at a certain mathematical distance from the plate when taking a picture I cannot see, any more than that we should be compelled to rack out our cameras to their fullest extent, as the maker has made it to extend that distance. Whether the resulting print will be a picture or no is, of course, a matter of taste and argument; but, as we all probably take photographs for our own pleasure, we can surely be allowed to suit our own tastes. And one method of getting an improvement in one's pictures I should here like to mention, a process used perhaps by many of you by accident, and when you were not in a fit state to appreciate its beauties. That is, by printing through the glass. In carbon it is particularly useful, as it saves the double transfer of the prints; but in other processes the same effect can be got by putting a thin piece of glass between the print and the negative. You will be surprised to find how it will improve some photographs, and, I must confess, how it will spoil others. I shall be happy to give you the results of my experience in the matter, namely, Do as you like with your landscapes, but do *not* try this dodge with your purely architectural subjects. I have here (at least, I hope so) a landscape treated this way, and a print from the same negative done in the ordinary way. To my mind it seems that the out-of-focus print gives much more the appearance of mist and atmosphere than the sharp one, and also makes a picture of an otherwise very ordinary subject. But perhaps you may not yet be able to appreciate the beauty of it. I have also an architectural subject treated the same way, but will leave you to find out its merits. At any rate, I think it will show you that artists are wrong in saying that the camera is an automatic machine, and will simply give the effects of atmosphere that existed at the time the photograph was taken. Look at the out-of-focus print of the boat and river, and say whether it gives the idea of a brilliant sunshiny day; and yet, when it was taken, it was as brilliant a day as any we had last summer, without a cloud in the sky. And I should like to ask one of these artists who make such an assertion to take a camera, and try whether with this despised machine he could give us a print which would really give one the idea of sunshine. I do not think I shall be doing him an injustice I say that I do not think he could do it, even after some months of practice. And then, again, what different effects may be got by using rough or smooth paper for our prints. As I have mentioned once before, artists say that in using rough drawing-paper we are committing two faults, copying painters and losing detail. As for copying painters, I say that, if there is an advantage in having a water colour on rough paper, so likewise there is in photographic work, and, because workers in oil paint on canvas, it is no reason that photographers should be for ever debarred its use. And I would also say that their second charge is also faulty. I deny *in toto* that the least detail is lost on rough paper, but, rather, that the detail in an architectural subject is much more prominent on a rough drawing paper than on a smooth albumenised print. Nothing like the amount of relief can be got on the latter than can be obtained on the former; and, then, there is so much more of what artists call modelling on the drawing paper. Take, for instance, the print that took a silver medal at one Exhibition a few years ago of the crypt, Canterbury, by Mr. Whiting. I contend that the amount of apparent depth there was in this picture was only obtained by the use of the drawing-paper. One could almost walk into the crypt and round the

* Concluded from page 347.

pillars, whereas a polished print would altogether have lost the effect; and the reason of this is not far to seek, in albumenised paper the silver image is so embedded in the paper, as can be proved by printing it on the wrong side, that it has a sunk-in appearance; whereas, on rough paper, and more particularly with carbon, the picture is wholly on the surface. And it is here that platinotype, I think, fails us. Once you start a rough surface with this process, and the image gets a more or less sunken-in appearance, as can be proved by taking a print from the same negative with the two brands of paper as ordinarily sold by them. I have found that the "A" paper gives a much better print than the "C" quality, and carbon has other advantages over platinum. For one thing it is much cheaper; another thing, we can print it on any surface we like, whether it be rough or smooth paper, glass, opal fabrics, or wood; and, again, we have an unlimited choice of colour and absolute permanency, and therefore I could almost sympathise with the aforementioned Editor in protesting against amateurs not making more use of it. But I will not, as I am not here to-night to tell you what to do, but only to give you any little experiences that I have jotted down during my photographic career.

And one thing that I have jotted down is, that papers read at photographic meetings should not be too long, but that ample time should be allowed for discussion. There are many subjects that I have brought before you that are open to argument, and many favourite processes of yours that you will think have been hardly dealt with, to say nothing of those that have not even been mentioned; but I trust you will see that, in ignoring bromide papers, lantern slides, and hand cameras, I have been consulting your convenience rather than my own feelings. I fancy that some of you have hopes of catching your usual train, and I know that I should like to, and shall therefore leave these very interesting subjects for members much more versed in their advantages than I am. I can only ask your indulgence for the very poor manner in which I have been able to touch on the subjects that I have had time to discuss, and trust that you will place all the defects down to my inability rather than to the want of merit of the processes themselves. I have brought no new process, no startling revelations to your notice, but have simply dished up the same old subjects that have been brought under your notice for some years, with possibly a few extra trimmings. I can only thank you for the kind and attentive way in which you have listened to my rambling remarks, and trust, if you have learnt nothing, that in the discussion that I hope will follow I may gain some further photographic jottings.

LESLIE SELBY.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

SHREWSBURY MEETING, JULY 15–20.

The following is the programme of the week's excursions:—

TUESDAY, JULY 16.

Excursion to Buildwas and Wenlock Abbeys. Leaders, Messrs. Della Porta and Laing. Carriages leave the Square at 9 o'clock; due back about 6.30. Tickets, including luncheon, 7*s.* 6*d.* Buildwas Abbey, founded 1135, originally Savigniac, and finally Cistercian, occupies a beautiful site in the Severn Valley, and presents features of great interest. The situation, to the north of the church, of the cloister and chapter-house is unusual. The latter is an oblong building, vaulted in nine compartments, supported by two octagonal and two circular columns. In the church Norman features are blended with the pointed arch. There is a triforium, and the clerestory windows are round headed. Wenlock Priory (Cluniac), once the site of a Saxon nunnery, founded by St. Milburgh, and again, 200 years later, of a church founded by Earl Leofric. Earl Roger's foundation of Benedictines was affiliated to the mother church of Clugny. The ruins cover thirty acres, and consist of part of the south of the nave, a considerable portion of the south transept, the chapter-house, and the Prior's Lodge, which last presents an unique example of the domestic arrangements of the period. The chapter-house is especially noteworthy, and there are other interesting features in the parish church and in the old, half-timbered houses in the town of Wenlock.

Excursion to Bridgnorth and Arley. Leaders, Messrs. Bromwich and Lawson. By train at 7.55 a.m. for Arley-on-Severn (landscape), allowing two and a half hours; thence to Bridgnorth per 11.31 train; or by 11.20 train for Bridgnorth only, returning at 4.1 or 7.52. Tickets, including luncheon, 6*s.* 6*d.* Bridgnorth is an ancient borough, incorporated 1157, beautifully situated on the Severn, the high and low towns being picturesquely connected by a bridge of six arches. The high town is built on a red sandstone rock, 180 feet from the bed of the river. St. Leonard's Church, in the Decorated style, is remarkable for its width (ninety-one feet), and the old hammer-beam roof is good. St. Mary Magdalene's Church, erected 1792, on the site of an earlier collegiate church, stands near the ruins of the castle (built 1098–1102), besieged by the Parliamentary troops in 1646, when it was greatly battered, the only remains being the picturesque leaning tower. The Town Hall is a fine example of a half-timbered building (on arches), and, among other specimens, are the houses of Baxter and Bishop Barry. A short distance out of the town will be found the Hermitage, the High Rock, and many other delightful places on the river.

Excursion to Stokesay (half-day). Leaders, Rev. J. D. La Touche and Mr. Heath. By 2.5 train to Craven Arms; tickets, 2*s.* 6*d.* A short mile walk brings us to Stokesay Castle, an almost unique specimen of an ancient fortified mansion of the thirteenth century. The great interest of the building is in the fact of its perfect preservation, having neither fallen into ruin nor suffered renewal or alteration in modern times. It consists of three tolerably distinct parts: a tower at the north end, which is probably the earliest portion; the banqueting hall; and the great tower on the south. There is a magnificent oak chimneypiece of Jacobean time. The gate-house is a fine example of a Tudor black-and-white building, and the court was surrounded by a moat twenty-two feet wide. The tower is of unusual form, presenting exteriorly the appearance of a double octagon, with battlemented parapet. The church is close by. Return trains at 4.51, 6.20, 6.40, and 9.9. This excursion will be repeated on Saturday if required. Stokesay can be visited any day by the half-day excursion tickets.

Papers:—At Music Hall-buildings. Lantern-slides illustrating Wednesday and Thursday excursions, &c.

WEDNESDAY, JULY 17.

General meeting, in the Council-room, at 10 a.m.; meeting of General Committee, in the Council-room, at 11 a.m.; Convention group, noon; annual dinner and smoking concert, 6.30 p.m. Short afternoon excursion to Haughmond Abbey and Hill. Leaders, Messrs. Barson and Ebrall. Carriages leave the Square at two o'clock. About one hour and a half will be allowed at the ruins, or the landscapists may at once proceed by a beautifully wooded road up the hill, which affords a splendid view of the Severn Valley, with Shrewsbury in the distance, and the Welsh mountains, including Cader Idris and the Arrans beyond. Afternoon tea will be served on the lawn at the hotel at Uffington, and Shrewsbury reached at 5.30. Tickets, 3*s.* Haughmond Abbey (Augustinian) was founded by the Fitz-Alans, 1130–1155. Of the church, dedicated to St. John the Evangelist, there are very slight remains, beyond a fine doorway opening into the cloisters. The chapter-house has a rich semicircular-headed doorway, with a semicircular arch on each side, nearly as rich, containing a double window divided by a shaft, the heads of which exhibit the incipient pointed arch. Sculptured effigies were superadded in the jambs in the fourteenth century. The Abbot's House has a beautiful oriel, and there are good windows in the Great Hall adjoining. In the wood at the back of the Abbey is a mediæval well.

THURSDAY, JULY 18.

Excursion to Church Stretton (landscape). Leaders, Messrs. F. W. Williams, Alltree, Buddicom, Campbell-Hyslop, and M. J. Harding. By special train, about 9.30, arriving at Stretton at 10 o'clock, where carriages will be provided for taking the different sections of the party to the points selected. Return train about 6 o'clock. Tickets, 5*s.* Mr. Arthur Hince, one of the proprietors of the Stretton Hills Mineral Water Company, has kindly invited members to luncheon at their works in the Cwm Dale. The lovers of landscape will find here full scope for their hobby. Stretton, or Street Town—so called from the Roman Watling-street (here only a narrow lane) which runs close by—has been aptly described as a North Wales in miniature. The town nestles close under the Longmynd, the top of which stretches away in many miles of grouse-moor. Upon Caer Caradoc the last stand of Caractacus was made against the Romans, many traces of whose encampments are still to be seen. The views from many of the hill tops are exceedingly fine.

Circular drive (architecture and landscape). Leaders, Messrs. Bowdler and Preece. Leaving the Square at 9.30, and visiting Atcham, with its pretty church and bridge over the Severn, Wroxeter, the ancient Uriconium, Cressage on the river again, Acton Burnell Park and Castle (of early Parliamentary fame), Pitchford Hall, a fine half-timbered mansion, and Condover Hall and Park, allowing good time for photographing at each place, and reaching Shrewsbury about 6.30. Tickets, including luncheon, 7*s.* 6*d.*

Papers:—At Music Hall-buildings. Lantern slides illustrating Friday and Saturday excursions, &c.

FRIDAY, JULY 19.

Excursion to Ludlow. Leaders, Messrs. H. P. Robinson, T. J. Salwey, and J. H. Williams. By special train about 9.30. Return train about 6 o'clock. Tickets, including luncheon, 7*s.* 6*d.* Ludlow abounds in features of interest to the photographer. Its beautiful church of St. Lawrence will, doubtless, first attract attention. Standing in the highest part of the town, its great extent and cathedral-like form, its lofty and highly enriched tower, and its finely-carved roof, cannot fail to impress the visitor. The oak choir stalls contain some curiously carved misericords, and there are some fine monuments. There is also a fine hexagonal porch. Ludlow Castle, in its commanding site, forms an imposing picture of an ancient border stronghold; it was built between 1086 and 1094. The keep, which rises to the height of 110 feet, divided into four storeys, is probably the oldest part. There is a circular chapel (temp. Henry I.) with a richly decorated doorway. The castle was the chief residence of the Lords Marchers of Wales, and within its spacious halls kings and princes have held their court. In 1634 Milton's

Masque of Comus was played here for the first time, the poet himself being present. The inner portal of the castle was built during the presidency of Sir Henry Sidney, whose family arms are still above it. Over several stable doors are the arms of Queen Elizabeth and the Earl of Pembroke. About forty rooms in this castle were entire in 1708, but it shortly after fell into decay, and, in 1821, was entirely in ruins. The Feathers' Hotel, with its fine panelled rooms of James I.'s time, is a good example of the black-and-white houses, of which other specimens are to be seen in Ludlow, notably the Reader's House by the church, and the fine old mansions at Ludford. Various good views may be had from the Whitcliffe, and the landscapist will find ample work in the River Teme, whilst not far away are the picturesque woods of Downton Castle, where delightful scenery will charm the visitor. Carriages will be arranged for after luncheon for any members wishing to proceed to Downton. Extra fare, 3*s.*

SATURDAY, JULY 20.

Excursion to Llangollen. Leaders, Messrs. Lloyd Edwards, G. Rowlands, and W. Dodd. By train at 8.10. Return trains at 2.25, 5.1, 6.20. Tickets, 8*s.* 6*d.*, including luncheon. The railway ticket allows of an extended stay at Llangollen. This excursion was included in the Chester programme, and is repeated by desire of the Council. The beauties of this district are too well known to need enlarging upon here.

Excursion to Welshpool and Powis Castle and Park. Leaders, Messrs. Forrest and Naunton. By train at 10.30. Return trains, 3.20, 3.55, 5.15, 6.45. Tickets, including luncheon, 6*s.* 6*d.* By kind permission of the Earl of Powis, the extensive park and grounds will be thrown open to members. The park is of great extent, the wilder portion being especially beautiful, and from the higher ground superb views of the Welsh mountains, including the Arrans, Cader Idris, and Snowdon, can be obtained.

Excursion to Downton and the Hay Mill, near Ludlow; excursion to Stokesay. Arrangements for these will be made if required.

PLACES OF INTEREST IN AND NEAR SHREWSBURY.

The Castle, once a formidable fortress, now a private dwelling, faces the only land approach to the town, which is otherwise encircled by the River Severn. The ancient portions are two massive towers of Edward I.'s days, the walls of the inner court, and a Norman arch. From a modern tower in the gardens there is a fine view of the surrounding country.

The Free Library and Museum, a fifteenth-century building, founded and used until 1882 as the famous Shrewsbury School. Herein is a very fine collection of Roman antiquities from Uriconium, and other objects of great interest to archæologists.

The Council House (1502), formerly the residence of the Lords Marchers of Wales; its gateway house dates from 1620.

St. Mary's Church, whose beautiful interior is full of architectural interest. In the great gale of February last year over forty feet of the spire came down, crashing through the fine roof of the nave, the restoration of which has just been completed at a cost of 8000*l.*, subscribed within six weeks of the disaster. In the South Chapel is a good altar tomb, and there is some beautiful stained glass, especially in the triple-lancet window in the north aisle.

St. Alkmond Church, one of the ancient Saxon collegiate foundations, though the existing edifice dates only from 1795, the graceful spire being its chief feature.

St. Julius' Church, rebuilt in 1750, when only a few of its ancient features were preserved.

Old St. Chad's Church, of which only a fragment remains, the edifice having been destroyed by the fall of the tower in 1788, and the parishioners then built near the quarry the new church of St. Chad, a circular building (1792), rather curious than beautiful.

The Church of the Holy Cross, an imposing pile which formed part of the great Benedictine Abbey of Salop, dedicated to SS. Peter and Paul, and founded in 1083 by the Norman Earl of Montgomery, recently restored by the erection of transepts, chancel, and clerestory from the plans of Mr. Pearson. There are here several fine tombs, and on the south side, across the road, is a beautiful Frater pulpit.

The Column, 133 feet high, erected 1815–16, to commemorate the fame of Lord Hill.

The Whitehall, a fine old manor-house of great interest, built 1578, with its old gate-house, and an unusually large octagonal dovecot (c. 1510).

The Old Market Hall (1596), near which is the Shirehall and a statue of Lord Clive.

The Quarry, with its fine avenues of limes fringing the Severn, is the popular resort. Several good pictures will be found on the river, across which is the new building of Shrewsbury School and the pretty boat-house of the Pengwern Club.

On the Town Walls is a square-embattled tower of Henry III.'s reign, and a little further on is the Roman Catholic Cathedral, built by Pugin in 1856. Interiors of two very beautiful chapels are especially noteworthy.

Black-and-white houses are plentiful in Shrewsbury; the view in High-street, including Ireland's Mansion, being particularly fine. Other excellent examples will be found on Pride Hill, Butcher Row, Wyle Cop, and Frankwell; and among other interesting places are the Old Mint on Pride Hill, Jones's Mansion in Church-street, Rowley's Mansion in Hill's-lane, St. Giles's Church, the birthplace of Charles Darwin, &c.

A good general view of the town, including the Spires and English bridge, is obtained by crossing the latter and making a foreground of the withy beds on the river bank.

Lilleshall Abbey, founded 1145, shows extremely interesting arrangements of conventual buildings; it has a noble western portal, and there is a fine procession door, with lavish ornamentations. By train to Donnington, 1½ miles from station.

Haughmond Abbey and Hill. (See Wednesday excursion.) Four miles by road, or about three by a river-side walk *viâ* Monkmoor.

The Wrekin, with its beautifully wooded surroundings, the view from which extends over fourteen counties. By train to Wellington, two miles from station. Return tickets, 1*s.* 8*d.* Half-day excursion tickets by any train after 12 o'clock, 10*d.*

Church Stretton. (See Thursday excursion.) Return tickets, 2*s.* 1*d.* Half-day excursion tickets by any train after 12 o'clock, 1*s.*

Stokesay. (See Tuesday excursion.) Half-day excursion tickets for Ludlow (2*s.* 6*d.* return) will allow members to alight at *Craven Arms* Station, from which Stokesay is one mile distant. Any train after 12 o'clock.

Ludlow. (See Friday excursion.) Return tickets, 4*s.* 7*d.* Half-day excursion tickets by any train after 12 o'clock, 2*s.* 6*d.*

Several good local guide-books are obtainable, giving details of Tong Church, with its fine tombs, Acton Burnell Castle, Hawkstone, with its fine park and old Red Castle, and many old Manor Houses, such as Pitchford, Park Hall, Albright Hussey, for which it is impossible here to find space.

Competent members of the Shropshire Camera Club will gladly suggest routes for any small excursions that may be desired.

The above dates and times are open to alteration.

MEANS FOR MITIGATING THE FADING OF PIGMENTS.

[Journal of the Society of Arts.]

IT is not my intention to-night to enter into the causes of the fading of pigments, whether water-colour or other. Were I to do so, I should have to keep the meeting considerably longer than either they or myself would consider desirable. I think I must take it for granted that the conclusions Dr. Russell and myself arrived at in 1888 (the date when we made our report to Parliament) have not been controverted or whittled away, and may be accepted as correct. I must, however, quote two of the concluding paragraphs:—"It may be said that every pigment is permanent when exposed to light *in vacuo*, and this indicates the direction in which experiments should be made for the preservation of water-colour drawings;" and "our experiments also show that the rays which produce by far the greatest change in a pigment are the blue and violet components of white light; and that these, for equal illumination, predominate in light from the sky, whilst they are least in sunlight, and in diffused cloudlight, and are present, in comparatively small proportions, in the artificial lights usually employed in lighting a room or gallery."

At the end of the report we make some reference to glazing the skylight with yellow glass, and point out that it would be inexpedient to do so, as, although the safety of the pigment's colours would be thereby ensured, or at all events be made more certain, yet in such a light the hues of the blue pigments would suffer to the eye.

The first method of preserving the colour of pictures by placing them *in vacuo* has been experimented upon by a company, and it would not become me to say what success they have attained in this direction. The method that I have adopted to minimise fading has been in the direction of controlling the kind of light admitted to the pigments. The point from which I started was from the results of the experiments made as to the fading of different pigments under coloured glasses. The glasses employed were red, green, and blue, which are approximately the three primary colours, and it may be instructive to show you the rays which these three glasses allow to pass. If in front of the slit of the spectroscope a piece of red glass is placed, we see that the spectrum is deprived of all the green and blue rays, only red, orange, and a few yellow rays being transmitted. With the green glass the red rays are almost altogether absent, as are also the violet, but the green rays are strong, as are the blue-green, and there is a fair proportion of yellow and blue rays passing. Through the blue glass the violet and blue rays pass readily, the green and yellow and red are cut off, though there two faint bands apparent in the yellow-green and in the red. It will be noticed that practically these glasses divide the spectrum into three parts, (1) the violet and blue

(2) the green and yellow, and (3) the orange and red. The following Table shows how little action takes place under any glass except the blue, and our statement that the greatest fading in white light is caused by the violet and blue rays is founded on it.

	White.	Blue.	Green.	Red.
Purple Madder	Faded to 2	Faded to 1	—	—
Antwerp Blue	No experiment	Faded	—	—
Leitches Blue	Sl. faded	Sl. faded	Darkened	Darkened.
Violet Carmine	Faded to 1	Faded to 1	—	—
Payne's Grey	Faded to 1	Bluer	Blue	—
Indigo	No experiment	Faded to 1	—	Sl. faded.
Prussian Blue	No experiment	Sl. faded	—	V. sl. faded.
Rose Madder (2 experiments)	Sl. bleached	Sl. faded	—	—
Brown Pink	No experiment	Faded to 3	—	—
Crimson Lake	No experiment	Faded	Sl. faded	Sl. faded.
Vandyke Brown	No experiment	Faded to 1	Sl. faded	—
Vermilion	Darkened	V. sl. darkened	—	—
Carmine	No experiment	Faded to 3	Sl. faded	—
Gamboge	No experiment	Faded to 1	—	—
Indian Yellow	No experiment	No change	—	—
Sepia	Become lighter	Become lighter	—	—
Burnt Sienna	No change	No change	—	—

Other experiments have shown me that the violet rays are the most active in producing fading, as they are also in producing an ordinary photographic image. If we can eliminate the majority of these rays from white light without appreciably altering the freshness of the colours viewed in such light, we shall practically have prolonged the life of a picture. At first sight that these conditions can obtain may appear problematical; but I trust that you will agree with me shortly, that we can cut off some of these rays without injuring the hue of the colour.

Now, I must ask you to take it from me, from a series of experiments made, that ultramarine is that pigment whose dominant colour is nearest to the violet end of the spectrum; and when I say dominant colour, I mean a colour which has approximately the same colour as a spectrum colour, though it may be mixed with white light to a variable amount.

We can show the dominant colour of some pigments. For instance, here is an orange pigment: I can match that in the spectrum by one orange ray. Emerald green I too can match, but we must have a certain amount of white light mixed with it. Pure ultramarine, too, we shall see, has a dominant wave-length well below the G. Fraunhofer-line. It therefore follows that if we illuminate all pigments with a compound light, in which this ultramarine spectrum colour is included, they must appear appreciably the same as they do in white light.

I must guard myself, however. Do not let us suppose for one instant that these dominant colours are alone those that are reflected from the pigment. They reflect a good many more. We can show that this is the case. I place a pigment in the patch of monochromatic light from the spectrum, which can be changed at will, and, the more luminous the pigment appears in any particular colour, the more of that particular light we know is reflected. Thus we place emerald green in the patch and we see that it reflects but little red, more yellow, a maximum in green, and a very little blue. We also find that vermilion reflects a maximum in the red, very little yellow, and practically nothing else. Ultramarine, we find, reflects a very little red, no yellow, a very little green, plenty of blue, and some violet. If we cut off the violet from the spectrum and place the ultramarine in it we shall, however, find the colour appreciably the same it was when the violet was present.

A variety of experiments made with these different pigments tell us that the loss of the violet of the spectrum is practically no loss at all. Even with white light the loss is unnoticeable. If we form a patch of light composed of all the colours except the violet, we shall notice but very little change from the pure white which is alongside of it.

Having established this fact, we are now in a position to go a step further.

In the apparatus I have here at hand, I can place three slits in the spectrum, and by means of a convex lens of proper focal length and curvature, I can cause these colours to re-combine and form a patch of white light, being an image of the prism. The slits are now in the spectrum, and a patch of pure white light alongside. I alter the width of the slits till they show the patch of the same colour as the comparison white. The colours are red, green, and blue. Now the red and the green themselves, when mixed, form a yellow, and this can be demonstrated by covering up the slit through which the blue issues—you will see a yellow patch on the screen—evidently, then, since red and green make yellow, a yellow and a blue will form white light. To prove this further, I place a slit in the yellow, and another in the blue, and we have white again formed. As a matter of fact, with any kind of yellow and any kind of blue there is always some blue ray and some yellow ray which will form white light with them respectively by their mixture. But it does not follow that such a white light is a proper one in which to view coloured pigments. For instance, in this mixture of blue and yellow of the spectrum I place an orange, you see it appears yellow; or if I place a green in it, it appears whitish, and so on. I might multiply my experiments in this direction, but they would only prove that there must be something beyond a mere match of white light to make it effective as a pigment illuminant. That "something beyond" is really a continuous spectrum. That is, every ray must be present except the violet rays, which have been shown to be practically useless for giving illumination (I may mention that the yellow ray has about 200 times the illumination of the strongest violet ray, which we can spare without detriment). Where a portion of the spectrum is altogether absent or deficient, those pigments whose dominant colours lie where these deficiencies are to be found must inevitably alter in hue, just as we found to be the case just now. If we can get a yellow and a blue which together will have such a spectrum when combined together, we shall have accomplished what we want.

Now, here is a green-blue glass, such as is used for ordinary ships' lights. When placed in a beam of white ray, a place in the spectrum can be rapidly found where the yellow is such as will form a white light with it, or a yellow glass can be placed in the white light, and a blue ray found, which, when mixed with it, forms white light. You see the mixtures before you, and, I fancy, will not find much fault with them. If we compare the blue-green spectrum ray which forms the white light with the light coming through the yellow glass, we find that it matches the blue of the glass very closely. Evidently, then, we can mix the light coming from these two together, and they should also form white light. This we can easily test. The blue glass is now in one beam of white light, and the yellow in the other. By superposing on the same screen these two lights, and then reducing them to proper proportions, we see that we have a white light which is a very close match to that of electric light.

Another step further we must go. Is the blue-green glass of that type which cuts off the proper amount of violet light? This we can answer at once by an appeal to the spectrum. We have the spectrum of the electric light on the screen, and place in front of the slit the glass. You will see that the violet almost entirely disappears, leaving the blue bright, but cutting off the red. We can do the same with the yellow glass, and we find that it cuts off all the violet and a deal of the blue-green. We have seen what sort of a white a mixture of the two make, and we can tell what kind of a spectrum they make by rapidly rotating in front of the slit a sector in which are the two glasses showing proper proportions. We see now the spectrum of the combined lights upon the screen. It is quite different from that of white light, for there is no violet in it, and it has perhaps rather more green-blue in it; but this is an advantage, as it shows that the blues will not suffer when viewed in such a light. In fact, a little more predominance, if anything, will be given to the blues. Had I used the ordinary cobalt blue glass, you will see that I should have gained nothing in safety. The spectrum, with such a glass interposed before the slit, is again on the screen. You will remember that it is a banded spectrum, admitting all the violet and blue, cutting off the green, but allowing a band of yellow and two of red to pass through. As the blue-green glass cuts off the violet, we may take it that it is much safer to use light coming through it than ordinary white light, as far as the fading of pigments is concerned. It was in experimenting with this glass that I came to the conclusion that if we used the light passing through it as one component of a mixed light, and could find a light passing through a yellow glass which would neutralise it, we should have a valuable means of securing greater immunity from fading than we have by using white light alone. The yellow glass I have shown you was selected not as the most perfect sample, but as being very transparent. If anything, it wanted a trace more red with it, but without it we get a combination which ought to answer every purpose. Let me show you how some pigments look in this light. I place a lens in front of the lantern, and make a disc on the screen. Where the rays cross, a rotating sector is placed containing these two glasses, so that the disc is alternately illuminated by the blue-green and yellow light. The change is so rapid, that the two colours blend one into the other. I place various coloured pictures in the beam, and note their appearance, and then illuminate them with ordinary white light of the same intensity. We find that the two are almost exactly alike, every colour shows in the one as well as in the other, and apparently a difficult problem is solved.

I well remember the first small experiment which I tried with these glasses. It was in a small photographic studio which we have at South Kensington Museum, erected for the use of outside photographers. A small portion was curtained off, and the roof glazed with these glasses in proper proportions. Water-colour sketches were taken into this light, and critically examined by some whose opinion I highly value. The Chairman, for instance, whose exhibit at the New Gallery shows him to be a colourist of no mean order, approved, and so did the Director for Art, Mr. Armstrong.

So successful was the appearance of the colours, that an experiment on larger dimensions was made by the authorities of the museum when part of the roof of the gallery in which the Jones collection is housed was glazed with these glasses. The public freely circulated through the gallery, and, as far as I know, the criticisms which were passed were few, and certainly not as a rule condemnatory. The committee of artists, who acted as advisers in art matters to Dr. Russell and myself, when carrying on the investigations as to the fading of pigments, and of which

Sir F. Leighton was the chairman, gave it as their opinion that the lighting was satisfactory.

When the Raffaelle Cartoon Gallery was to be reroofed, the authorities directed that the glazing should be carried out with these coloured glasses, to prevent, as far as possible, any further fading of these valuable works of art. The glazing is in alternate strips of the two colours (some few panes have been glazed with ordinary white glass, to allow for slight modifications in the proportions of the two colours, if considered desirable) on the slope of the roof. The light, before coming into the gallery, traverses a flat skylight of corrugated white glass, which distributes and scatters the colour, even when sunlight streamed through the coloured panes. It has been a source of amusement to myself to stop in this gallery and note the effect the light produced on the minds of the different parties who passed through it. The large majority of persons saw nothing peculiar about the light, and failed to notice the coloured glasses in the roof, whilst others noticed them and could not understand what they meant. Americans seemed to be those who were most observant. I have had the advantage of hearing the criticisms of several artists regarding the lighting of this cartoon gallery, and the general dictum was, that the colour and lighting were satisfactory. One artist told me he wished he could always have such a warm light in which to exhibit his pictures. He said it was a most becoming light. In choosing the proportions, I was led to make a mixture which imitated, as far as possible, a mixture between a blue sky light and a warm sunlight. Light from a blue sky is always cold, and light reflected from clouds is, I believe, the illumination artists like, hence my choice of these. When the light is principally from the blue sky, this meant that the yellow light predominated a little more than it would do when the mixture was made by the electric light. In order to arrive at this colour, I took sunlight itself as the standard white, and adjusted the proportions of sky light passing through the two glasses in such a manner that the warmth of a light from a sky partially covered with white clouds was found in the mixture.

It may be of interest to know what the illumination is compared with glazing by white glass—that is, how much is cut off. This can be very readily ascertained by measuring the luminosity of each colour coming through the glasses.

We can make the experiment for ourselves.

First I place the yellow glass in one white beam, and alongside it send another beam of white light. By intervening a rod in the paths of the two beams to cast two shadows, and reducing one by rotating sectors, which can give a larger or smaller aperture at will during rotation, we can arrive at a point where the two shadows are equally luminous.

Removing the glass, the balance is again secured, and we find that in this case the aperture required is sixty degrees, and in the other eighty-five degrees, showing that the yellow glass allows $\frac{1}{1}\frac{2}{7}$ths of the white light to pass through it. We can do the same with the blue-green glass, and find it cuts off a deal more, allowing only one-sixth of the light to pass. Now, if half the roof be glazed with yellow glass, and the other half with the blue-green glass, the total light passing through is only forty-five per cent. of what would fall through the aperture of the roof if no glass were in it. Absorption and reflection by white glass reduces that loss to about fifty per cent., a great diminution, it is true, but still one which is made up for in several ways. In the Raffaelle Cartoon Gallery, the open area in the new roof is considerably larger than it was in the old roof, and the light is practically the same as it was before. Further, the use of ground glass or blinds is done away with, ribbed glass being substituted. The ribbed glass, as before stated, helps the mixture of the two colours when falling on the pictures.

I do not say that the lighting is perfect, and that improvements cannot be made in it. Science never comes to a finality, but I am bold enough to think that it is a step in advance. What may be termed the "fading value" of the light can be readily ascertained. In the diagram before you, we have the photographic absorption spectra of the blue-green of the yellow glasses and of the two mixed lights. It will be seen that the violet is totally, or very nearly, inactive. In the ultra-violet there is a carbon band, which is intensely active, photographically, in the electric arc light. This is slightly transmitted through the yellow glass, but in sunlight these rays are so weak that they only appear after very prolonged exposure. What the effect is may well be judged by taking an ordinary photograph in this gallery and in the adjoining one. I find that a bromide plate requires nearly ten times the exposure in the former that it does in the latter when photographing a picture. Bromide of silver being sensitive to the green does not show such a difference as chloride of silver does. Here are two pieces of such paper exposed for equal lengths of time, viz., one hour, in each of these galleries. You see that whilst the piece exposed in the ordinarily lighted room is quite dark, the photographic action appearing on the other is very small.

What the extension of time for fading is I cannot say. Putting it as low as ten times we have a considerable saving. Thus, a picture which in ordinary light would last ten years will, if hung in this light, last at least 100 years, and probably 200 years. In some calculations made in our report, Dr. Russell and myself stated that it would take 100 years in one of the museum galleries for pigments to arrive at the fading shown by our experiments. Had this glazing been adopted, we should have to have increased this time to at least 1000 years instead, a time sufficiently long to enable further advances to be made in the knowledge of what will completely hinder all fading.

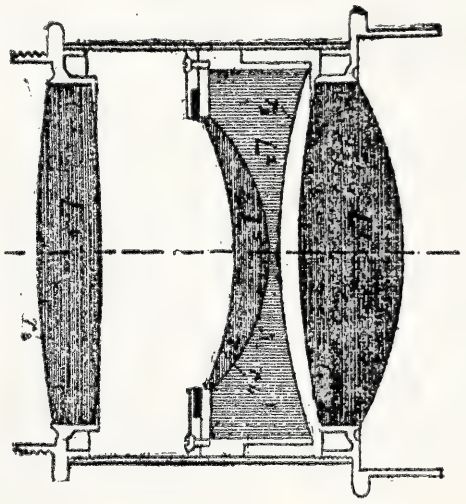
I have now shown you the reasons which led me to experiment with this glazing and to judge it as efficient. I trust the lighting of this Raffaelle Cartoon Gallery may prove not to be merely a safe experiment on a large scale, but a real step in the right direction, which, perhaps, may with advantage be adopted elsewhere.

CAPTAIN W. DE W. ABNEY, C.B., F.R.S.

THE DENNIS TAYLOR NEW LENS.

BY the kindness of Messrs. T. Cooke & Sons, Buckingham Works, York, we are enabled to give our readers a brief account of that individual one of Mr. Dennis Taylor's optical creations which, there is reason for thinking, will take precedence of his other works of a like nature.

In the first place the lens is *sui generis*, being quite unlike anything that has formerly appeared. Indeed, it is rather difficult of classification. As shown in the cut, which affords a general idea of



its nature, one is at first rather uncertain whether to class it as a double or a triple combination. It can scarcely be a triple, for the separation of the first from the second element is too slight to warrant the term, for the particular objective which we have examined has a much less amount of separation than is shown in the cut, but not nearly so much as we find in the back combination of a portrait lens of the same dimensions. The group of three lenses which form the anterior part of the combination may therefore be regarded as an achromatic whole with an air space between two of them. The negative lens of this group is externally a double concave formed of two cemented elements, as shown in the cut. The back lens is of a form different from that of any other, being almost plano-convex, the flatter side being only very slightly convex, and this lens as a whole made of only one piece of glass.

On trying the lens, we found that with its largest aperture (f-5·6) excellent portraits could be obtained, characterised by a combination of softness with all the sharpness desirable in a portrait. The field being quite flat, even with its full aperture, it is self-evident that for taking a landscape or group with very great rapidity it is well adapted, the only necessity for using a stop being to secure greater penetration from the near to the distant. We did not find any presence of flare.

Englishmen are justified in feeling somewhat proud of a lens of the excellence and undoubted originality of this one, having been ushered into the world without having had the aid of the brainwork of Continental mathematicians to whom we have hitherto been so much indebted.

As we have said, it covers flat and well without being stopped down, and therefore it is well adapted for hand-camera work. Its covering powers are greatly extended when the iris diaphragm is brought into use.

Our Editorial Table.

MANUEL DE PHOTOCHROMIE INTERFÉRENTIELLE.

Par A. BERTHIER. Paris: Gauthier-Villars et Fils.

M. BERTHIER'S little book is one of the handiest and most useful that has been issued from the well-known house of Gauthier-Villars. It gives in detail an account of the work and methods of Lippmann, Lumière, Valenta, in interference photography; devotes chapters to the preparation of the sensitive layer; orthochromatism applied to the subject; development, &c.; and describes, as it were, the optical system required in the projection of a spectrum for photographic purposes. It concludes with a chapter which considers the various theories of interference. The experimentalist in colour photography will find this a capital up-to-date *résumé* of the subject.

THE LAW OF COPYRIGHT IN DESIGNS.

By LEWIS EDMUNDS, D.Sc., LL.B. London: Sweet & Maxwell, 3, Chancery-lane, W.C.

THE author, in his preface to this treatise, informs us that about 20,000 designs are annually registered in this country. We also gather that "no work specially devoted to the law of designs, and attempting a complete treatment of the subject, has appeared for many years past." The one fact taken in conjunction with the other surely justifies the preparation of the volume, which, it is easy to see, has the possibility of being very valuable.

The contents include chapters on the history of the law of design; the meaning of "design;" novelty treated under the heads of "new and original," and "publication;" registration; the register; the proprietor; marking; infringement and remedies therefor. In addition to other matter, an appendix of statutes is given, and so far as we can judge, the work, which bristles with quoted cases, is most exhaustive and complete. Here is a hap-hazard extract which may be of use and interest to many a photographic patentee or design owner. "That a design is also good subject-matter for a patent is immaterial to the inventor who desires to take advantage of the cheaper, though more limited protection, afforded by . . . . the Act. But he must remember that no mechanical contrivance or principle, no process of manufacture can be a design. If any advantages such as attend a mechanical contrivance be obtained, the invention is a design only so far as the result is brought about by the shape."

News and Notes.

THE "SHASHIN-SOWA," No. 18, Nichiome Minami Sakumachio, Shiba, Tokyo, Japan.—We have received the following: "To the editor.—Dear Sir,—We beg to announce that a great improvement has been made in the *Shashin-Sowa*, beginning with vol. iii., No. 9, in the matter of introducing an English section to be printed with each number. In connexion with this matter Professor W. K. Burton has promised his kind aid.—Very truly yours, Y. ISAWA, the editor, the *Shashin-Sowa*."

THE PHOTOGRAPHIC EXHIBITION.—The prospectus of the fortieth annua Exhibition of the Royal Photographic Society has been issued. The Judges this year are: In the Art Section, W. L. Colls, Colonel J. Gale, F. Hollyer, B. G. Wilkinson, and W. L. Wyllie, A.R.A.; in the Technical Section, Captain Abney, Chapman Jones, F.I.C., F.C.S., and Andrew Pringle, F.R.M.S. The Exhibition will be inaugurated on Saturday, September 28, by a private view, followed in the evening by a *conversazione*, and will remain open until November 14. The Council have this year decided to issue an illustrated catalogue in the place of the usual one, reproducing in it a selection of the pictures best calculated to convey an idea of its appearance, otherwise there is no important alteration in the lines upon which it will be conducted. The Exhibition will, as usual, be held at 5A, Pall Mall East, and particulars can be obtained from the Secretary at the Society's new offices, at 12, Hanover-square, W.

THE INTERNATIONAL SUMMER PHOTOGRAPHIC EXHIBITION.—Mr. W. D. Welford (59 and 60, Chancery-lane, W.C.) writes: "The Judges for the Special Competitions open to amateurs who have not previously won a medal or prize at a photographic Exhibition are: Messrs. R. Child Bayley, Secretary of the Royal Photographic Society; Thomas Bedding, (THE BRITISH JOURNAL OF PHOTOGRAPHY); and James A. Sinclair. Two entries for the Special Society Competition have arrived from the Cape Town (South Africa) and Ottawa (Canada) Societies, so that this event also will be international. In view of the enormous number of entry forms still being applied for, in order to give more time for the arrival of exhibits from workers in Australia, New Zealand, Japan, and other distant parts, who have not had much time, and, finally, because I have sufficient time in hand (the Exhibition not opening until the 29th), I have decided to extend the time for receiving entry forms and exhibits to June 17."

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.—It was decided at the annual meeting (Leeds, February 14, 1895) that this year's summer excursion should be held at Matlock and District, Tuesday, June 11 and following days. Ladies are specially invited. The *Guide Book* will indicate briefly some of the beauties and attractions of this "Switzerland" of English scenery, which should be of special interest to photographers. It is imperative that we should know as soon as possible the names of members intending to join the excursion so as to provide for the comfort and enjoyment of all. Arrangements will then be made for special moderate tariff at good hotels. Excursions to Chatsworth, Haddon Hall, Dovedale—visits to the Tors, Caverns, &c. Boating and fishing. Mr. Hilder (Matlock Bath) and Mr. Statham (Matlock Bridge) have courteously promised to afford information and service to members of the National Association of Professional Photographers. W. Barry (Hull), President; D. J. O'Neill, Secretary, 47, Charlotte-road, Birmingham. Headquarters, Royal Hotel, Matlock Bath.

RECENT PATENTS.

PATENTS COMPLETED.

NEW OR IMPROVED METHOD AND MEANS OF EXPOSING AND CHANGING FLEXIBLE SENSITIVE SURFACES, USED AS A PACK, IN PHOTOGRAPHIC CAMERAS.

No. 11,387. HENRY HILL, 151, Fentiman-road, Clapham, London, S.W., and ARTHUR LEWIS ADAMS, 81, Aldersgate-street, London.—*April* 27, 1895.

HERETOFORE to enable a number of thin, flexible, sensitive surfaces (such as are known as "cut films") to be placed in a series or pack in a chamber for exposure in a photographic apparatus or camera, and there successively exposed (while held in said chamber), and thereafter removed from such chamber, it has been necessary or usual either to mount each such film on or in a light-tight back, or "sheath," or separate cards, or light-tight sheets have been interposed loosely between each of the films in such pack, and notching, or other special preparation of either the films or "backs" or both, or else special packing or arrangements of the films and backs have been used, in order to effect the separation and removal of each film after exposure, and other analogous means have been tried.

Now, our present invention is designed for the purpose of enabling films (and by the term "films" we intend to include any suitable flexible sensitive surface for receiving photographic impressions) to be used unaltered, *i.e.*, so that such films, just as same come from the manufacturer, can be placed in a suitable compartment in the photographic apparatus without interposing any material whatsoever between each of the films, these being consequently all laid together in a pack in said chamber, which latter corresponds in size and shape with the size and shape of the films, and may be of sufficient depth to hold, say, fifty or one hundred (or more or less) of said films, as desired, while the front of said chamber has a rebate down the two vertical sides thereof (or other well-known or suitable device), against which the front film bears, and is pressed by a spring or springs on the back of the pack, pressing the whole series forward, and thus bringing the front film "up to register," that is, into correct focal position to receive the exposure.

Now, according to our present invention, we select and separate the front film from the rest of the pack without removing said film from its said front position, and at same time prevent any light from penetrating beyond the actual front film during the exposure thereof, and thereafter remove said front film into another chamber (*i.e.*, the storage chamber), and thereby allow the next succeeding film to automatically come up to register, and so on in succession all through the pack, and for this purpose we proceed as follows:—

In a suitable case or camera we arrange a suitable compartment (which we may conveniently term the "exposing chamber") to receive the series of films for exposure, which are placed therein all facing towards the lens aperture in a pack all pressed forward by a spring or springs, the face of each film touching and pressing against the back of the next, except the foremost one, which bears against the aforesaid rebate, and is there brought up to register, while the bottom of this exposing chamber does not extend under this front film, but terminates clear of the bottom edge of same.

The aforesaid spring may advantageously be fixed to, or bear against, a rigid plate at the back of the pack, so as to evenly distribute the spring pressure over the back of the films, while, at its other end, it may advantageously be attached to the door or cover closing said chamber.

Parallel, and in the same plane (or thereabouts) with the position for exposure of the front film, we arrange and mount metal guide rails, or other suitable guideway, which is formed down each side of said exposing chamber, and this guideway continues below said chamber, and then is curved, and extends forwardly parallel or thereabouts to the bottom of said chamber.

In or on this guideway, on each side (or equivalent), travels a flexible carriage or light-tight backing and film-removing device (which, for brevity, we will hereinafter refer to as the "carriage"), of a size rather larger than the size of the film.

This carriage may be advantageously formed of a sheet of thin and very pliant metal, mounted on a series of laths or cross bars, the extreme ends of which latter are guided in or on said guideways, or the carriage may be formed otherwise than of one single sheet of metal, or other suitable material, provided same will remain light-tight and capable of passing round in a curve.

The said laths or cross bars may have shoulders formed thereon near their ends, so as to bear against the inside edge of said guideways, or other suitable means (such as blocks fixed on the back of the said carriage) may be adopted to prevent lateral movement, while the said ends which enter the channel forming the guideway do not extend beyond the exterior wall of said guideway, except one such cross bar (advantageously the top cross bar), the ends of which pass right through the guideway on each side, and are passed into a suitable slot in a draw lever, or otherwise suitably engage in or with a suitable operating lever down each side, terminating in a cross bar and knob, or other

suitable device, on the exterior of the camera or case by which to operate our apparatus.

On each of the guideways we arrange a rocking lever, pivoted to said guideway, or some other convenient part of the apparatus, each such lever being formed with a prolonged curved slot therein to form a camway, which is interposed in the path of travel of the said projecting cross-bar ends on each side, so that the curves of this camway lie across said guideway, whereby, when the said projecting ends travelling in said fixed guideway enter said camway, the said lever is consequently rocked on its pivot according to the nature of the curves of the camway, this rocking lever being normally kept pressed in one direction by a suitable spring or springs, and the mouth of the camway being of a suitable form to ensure the said travelling ends entering same.

Just in front of the bottom edge of the front film is a suitable stage or projecting platform on each side of the apparatus (or same may extend right across), and on such support is pivoted a film-pricking or stabbing device (towards each end of the film), which may be of any suitable character, and which are respectively actuated by the rocking levers just described, these latter being so arranged and mounted, and have the camway therein of such a form that, at the commencement of movement of the said carriage, to cause same to enter into its position behind the front film, thereby they (the rocking levers) impart motion to the film-prickers, which are thus caused to move towards the front film, which they stab, and then, while the lower front edge of the film is thus held impaled on these two prickers (or, instead of two, we may use any other suitable number thereof, or equivalents for same, for instance, suitable frictional surfaces instead of actually stabbing the film, although the latter is most advantageous, owing to its certainty of action) the latter continuing to move towards one another, thus force the bottom edge of the front film to bulge out towards the lens (and clear of the rest of the pack at the middle bottom edge, where said front film is bulged), and at this moment the top edge of the carriage, which is specially formed for this purpose (for instance, with a curved central projection thereon) comes in between the bulged part of the front film and the rest of the pack. The further movement of the carriage next causes the gradual insertion of the whole width of the top edge of the carriage between the front film and the whole pack, while, at the same time, such movement acting on the camway causes the rocking levers to now release the prickers from any engagement with said film, and said prickers retire quickly, leaving the carriage now introduced between the lower part of the film and the rest of the pack, and, as the movement of said carriage is continued to the top (where a suitable stop is or may be provided), it completely divides the front film from the rest of the pack, which latter it forces back a little, and thus forms a complete backing for the front film, which is now ready for exposure (in its original position, and held flat in and by said carriage), and, when this is given, no light can pass through to the rest of the pack.

To change the film, the reverse movement is imparted to the said carriage, whereby a lip or projection, or projections on the top inside edge thereof, engages the top edge of, and draws down, said film within the carriage, with which it passes round the curve into the horizontal position in the bottom of the case, and then, as the carriage is again moved up (to separate the next film ready for exposure), the film last exposed is stripped out of the carriage by a spring pawl, or other suitable device, at each side, which engage the top edge or other part of the film, and prevent its return with the carriage, and it is therefore thus stripped out of said carriage, and drops into the storage chamber, where it is kept light-tight (during the subsequent exposures of the other films in succession) by any suitable means for preventing admission of light to the said storage chamber.

In carrying our invention into practice, we have found that, to impart the requisite motion to the pricking appliances, a kind of elbow, pivoted to its support at its angle, and having one arm thereof engaging with, or connected to, the aforesaid rocking lever, and the end of the other arm formed as the film-pricker or stabbing device, forms a very good method of obtaining the impaling and bulging of the lower edge of the film as before described (and it is to be noted that such impaling devices must not be placed too wide apart nor yet too close together, otherwise same may not act properly); but we here wish to remark that we do not confine ourselves to the details hereinbefore described, inasmuch as it will be quite obvious that this momentary bulging-out movement to be imparted to the bottom edge of only the front film in order to permit the introduction of the carriage between same and pack, may be obtained in a variety of ways without departing from the true nature of our present invention; for instance, the motion may be imparted to the stabbing appliances by utilising the movement of the carriage in any suitable manner (other than that described) either direct or indirect, or by separate connexion with the operating handle; neither do we wish to confine ourselves to any particular device for stripping the exposed film out of the carriage after its removal from the front position.

When said carriage is being introduced, as before described, between the front film and the rest of the pack to prevent injury by the reciprocal movement of the carriage across the sensitive surface of the next film behind the front film, we arrange and mount along each side of the back of said carriage a flexible rib or swelling (for instance, a closely linked metallic chain, or a closely wound spiral spring), these ribs coming in contact with the sensitive surface of the film next behind the front one towards the extreme side edges thereof only (whereby the pack is forced back a little), and thus prevents the central part of the face of said next film from being touched or injured by the back of the carriage.

Any suitable device may be used to prevent light from penetrating to the storage chamber, for instance, a hinged flap (mounted at any suitable point, for instance, just below the bottom edge of the front film), which is forced by a spring or springs across the path of travel of the said carriage, and which is pushed by the latter out of its path—a protuberance or swelling on each side of said flap, bearing against the extreme side edges of the film held in said carriage while being removed therein, and thus keeping the flap from scraping or otherwise injuring the sensitive surface of the exposed film while it is being thus removed in said carriage.

Any suitable spring clips or other device may be used or arranged to act in the storage chamber (advantageously actuated by the movement of the carriage forcing same out of its way on entering the storage chamber to drop a film and releasing such device or devices on leaving said chamber again) so as to prevent the loose (exposed) films in such storage chamber from getting into such a position as to interfere with, or come in contact with, the carriage when same enters said chamber.

As a modification of the foregoing, the said carriage may be arranged to travel straight downwards in a perpendicular direction (or approximately so), and then have the film stripped therefrom as before described, or otherwise suitably discharges same into the storage chamber, which may be of any suitable form, to receive and hold said films in any suitable manner (for instance, vertically instead of horizontally, as before described), though this modified construction will probably be found to necessitate a rather increased size of the camera or case for holding a given number of films. Moreover, in such a case the carriage need not necessarily be formed flexible, as hereinbefore described, since it would not have to perform any part of its travel round a curve or curves.

As a further modification, flexible light-tight backings may be fixed on the back of each film, and in such case the "carriage" need not be light-tight, but will operate as before described, to select and separate each successive front film (with its attached backing), and remove same into the storage chamber.

Apparatus for Holding and Distending Photographic Films and the like.

No. 12,130. August Christian Kitz, Frankfort-on-Main, Germany. *April* 27, 1895.

This invention is intended to provide means for overcoming the difficulties attendant on the manipulation of photographic paper and other films in the developing and other baths, and due to the slippery and feebly resistant character of such films and paper when moist.

For this purpose the invention consists in certain improvements in clips or holders for such films and the like, whereby they may be suitable to hold the latter when undergoing the action of a bath.

The improvements consist in providing two clips with a connecting piece or handle, so constructed that the clips may severally grasp the film or the like along opposite edges, and be mounted in the connecting piece or handle in such a way that the film is kept distended, yet without tension thereon, or with such feeble spring tension that it is kept spread out, but is not liable to be torn or distorted, or the said clips may be used separately.

The clips are made preferably separate from this connecting piece or handle, so that they may be secured to the edge of the film in whatever place the latter may lie.

Where the film is of a nature to be very easily torn, split, or distorted, it may be held in the clip, together with a backing of some stronger material, which would effectually prevent any possible excessive divergence of the clips. The clips and the connecting piece may be made in any suitable shape or size, varying according to what they are intended for.

Each of the two clips may be composed of two plates hinged together, having the sides to one side of the hinge axis pressed apart by springs, so that the remainder of the plates are pressed together to clip the edges of the film or paper between them. The handle carries, pivoted to it, two socketed legs distended by a spring engaging on pins. Into the said sockets fit the tapered ends of one plate of each pair of plates respectively.

This combination thus forms a holder in which the edges of the film are held by the two clips, and kept distended by the spring in the handle, the clips having been brought into the same plane with the film to grasp its edges, before they are turned upward to be united with and by the connecting piece or handle.

Or the holding edges of the clips, which edges are of greater or less length, according to the strength of the film, may be in a plane at right or acute angles to the stems of the clips, and the stems are made to slide in each other for bringing the edges together. A plate spring holds the two portions of the clip together, and tends to press together their holding edges. This plate spring may as well be replaced by a spiral spring, constructed either for pressing or pulling. The one part of the clip is provided with a finger plate, and the other part with a rounded end. By pressing this finger plate and end together between the fingers and thumb, the clip is opened to engage the film. The connecting piece in this case is a piece of spiral wire, which may be fitted upon the ends of the clips, and gives a certain tension to distend the clips. This construction of holder permits the film to remain without bending at its edges, and is adapted to the holding of a rigid backing with the film. It will be evident that, in the case of using a sufficiently rigid backing, the before-mentioned connecting piece will not be absolutely necessary, as in this case the rigid backing acts as a connecting piece; it will, however, attribute to the comfort in handling.

The whole is made so that it can be readily taken to pieces for purposes of cleaning.

The above devices may be made of sheet metal or other sheet material, but if desired to make them of glass or similar material, the pressure of the parts of clips may be provided for by use of elastic bands, while the clips are held together by inserting their ends in the ends of a piece of rubber tubing of convenient length.

Improvements relating to Photographic Printing Frames.

No. 23,387. Henry James Spratt, Alfred Sidney Spratt, and George Albert Spratt, Tudor Works, Tudor-road, Hackney, London.—*April* 27, 1895.

Our invention relates to improvements in photographic printing frames.

The object of our said invention is to construct an improved printing frame, in which the ordinary pressure springs are substituted by springs which are fastened by the act of pressing them into position.

We do not limit ourselves to any particular form of spring catch, nor the particular manner of applying the same. Any convenient form may be employed, provided always that the spring catch shall automatically engage with the pressure springs when such pressure springs are depressed. For instance, a sliding spring bolt with a latch-shaped end, or any other similar device, might be substituted.

What we claim is:—1. Providing a photographic printing frame with pressure springs engaging with spring catches in such a manner that the act of depressing the pressure springs into position locks the same. 2. A photographic printing frame constructed substantially as hereinbefore described, and with reference to accompanying drawings.

Improvements in Shutters for Photographic Cameras.

No. 12,976. Edgar Pickard, Altrincham, Cheshire.—*May* 4, 1895.

This invention is designed with the object of providing a noiseless shutter, or one which will open to effect an exposure without any click or rattle, specially suitable for use in studios and for photographing animals, so that the attention of the person or animal will not be attracted until after the shutter has closed.

It consists essentially in constructing the shutter with two blinds meeting together to cover the aperture, mounted so as to roll up towards the opposite ends of the case or box, both blinds being rolled up simultaneously by a lever attached to a cord wound on the spindle of the rollers, and closed simultaneously and automatically by springs or spring rollers to which the free edges are connected by means of cords.

In carrying out the invention, I place inside the case or box of the shutter two blind rollers at opposite ends. To each of the rollers I attach a blind, each blind being of such a length as to reach a short distance beyond the centre of the aperture, so that when both are pulled down they overlap to close the shutter and produce a light-proof joint. No opening or slit is formed in either blind.

In addition to the two rollers upon which the blinds are rolled, two additional spring rollers are provided, one at each end, to which the free ends of the blinds are connected. The free ends of the blinds are connected to these spring rollers or to springs by means of cords attached to them. The cords are connected to the rollers by holes drilled in them and countersunk to receive a knot, and to the ends of the blinds by passing over or through a strut placed therein to keep the edges straight. The springs which actuate the rollers are preferably coiled or spiral springs, one end being attached to the roller, and the other fixed to the case to prevent rotation. As the blinds are wound up on the blind rollers to draw these edges apart and open the shutter, the springs are tightened by the cords being drawn off the spring rollers, and when the blind rollers are released the spring rollers wind up the cords again, and draw the edges of the two blinds together and close the shutter.

The cords of the two opposite blinds on their way from the edges of the blinds cross each other, which, when the blinds are closed, tend to hold the edges pressed together, rendering them more light-proof, or less liable to admit any rays of light.

A lever is attached to the edge of the case or box on the outside, raised by a pneumatic bulb. A cord from one end of each blind roller is attached to the lever. Each cord is wound round the spindle or pulley of the blind roller.

The raising of the lever and cords with it causes the rollers to rotate, rolling the blinds thereon, and causing the shutter to open the ends of the flexible blinds which meet in the centre receding from each other. When the lever is released, the springs draw the blinds together again until the edges overlap, and thus close the shutter.

A clip or catch is provided for attachment to the pneumatic tube, by which the tube can be bent or doubled in two, and so held for any length of time to prevent the passage of air through it after it has been compressed, and thus keep the shutter open for a prolonged exposure. The clip is made of a form or shape to grip the tube and to hold the two adjacent parts together when one is doubled down upon the other.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange Seavey's pedesta balustrade for table or chair 8 ft.×8 ft. interior in flatted oil for similar photographs.—Address, G. & J. Hall, Wakefield.

Will exchange handsome, pure-bred collie dog, twelve months old (had distemper), for half-plate camera with double backs.—Address, J. Phillips, 131, Tower Hamlets-road, Forest Gate.

Will exchange reversible balustrade with extra base and vase, cost 6*l*., also lady's gold signet ring, value 30s., both for good 12×10 or 15×12 rapid rectilinear lens by any good maker, or doublet.—Address, B. Pearce, Empire Studio, Machynlleth.

Will exchange four-back posing chair, upholstered in crimson plush, and 7½×5 camera with four double back slides (by Watson & Sons), for 15×12 rapid rectilinear lens (state maker) or 15×12 camera.—Address, C. Settle & Co., 11, Lumb-lane, Bradford.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
10	Norfolk and Norwich	
10	North Middlesex	*Photographic Journalism.* Alf. J. Johnson.
10	Richmond	
11	Birmingham Photo. Society	*Artistic Photography.* Charles Morgan.
11	Hackney	
11	Manchester Amateur	
11	Paisley	
11	Royal Photographic Society	*The Recording of High Temperatures by Photographic Means.* Prof. C. Roberts-Austen.—*Orthochromatics.* Captain Abney.
11	Stockton	
12	Croydon Camera Club	Printing on Collodio-chloride Paper.
12	Leytonstone	
12	Munster	
12	Photographic Club	Members' Open Night.
12	Southport	
12	Stockport	
13	Glossop Dale	
13	Hull	
13	London and Provincial	Paper by C. H. Oakden.
13	Manchester Photo. Society	
13	Oldham	
14	Cardiff	
14	Croydon Microscopical	
14	Halifax Camera Club	
14	Holborn	
14	Maidstone	
15	Ashton-under-Lyne	Excursion: Godley for Bottoms Hall Wood. Leader, S. A. Platt.
15	Croydon Camera Club	Excursion: West Brighton for Southwick and Shoreham, proceeding next day to Bramber, Steyning, &c. Leader, S. H. Wratten.
15	Croydon Microscopical	Excursion: Oxted, Tandridge, and Godstone. Leader, Mr. Baldock.
15	Hull	
15	South London	Excursion: Bexley. Leader, W. F. Slater.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

May 30,—Mr. J. E. Hodd in the chair.

The Hon. Secretary showed some photographs taken by means of two ordinary periscopic lenses roughly mounted in a tube so as to form a doublet. He also showed, for comparison, some prints produced by a bistigmat lens now in the market. He contended that, so long as a narrow angle only was used, that he was not warranted in buying the more expensive article.

Upon the question of such a lens being of universal application, Mr. W. E. Debenham pointed out that uncorrected lenses could not be used with orthochromatic plates and yellow screen, because of the colours coming to a focus at varying distances from the lens.

Mr. A. L. Henderson showed an old vignetting apparatus, the inner frames of which were all secured, together with the plate, by means of a single sliding lock-bolt, ingenious and effective. The vignetting was done by means of a pendulum swinging to and fro in the principal axis of the lens between the latter and the negative, and carrying a small vignetting opening.

The Chairman remarked that such an apparatus might be of use to bromide workers.

Mr. Henderson, in referring to the supposed green fog on Mr. Child Bayley's specimens of Lippmann's process, said that he had found a solvent for it in the fumes of a strong solution of cyanide of potassium. He had used it also for reduction before Mr. Howard Farmer's formula was published.

The Hon. Secretary said that a statement had been made that halation could be avoided by long exposures. His experience was to the contrary effect, and the prints shown to-night corroborated this.

Some conversation ensued upon the backing of plates, whether or not the plate would bear more exposure, in which Messrs. Debenham, R. Beckett, Bartlett, and the Hon. Secretary took part, the latter saying that the plate would bear twice the exposure.

Mr. Henderson, speaking of the "reversal" of the image, maintained that it was possible to develop plates without its showing. It was agreed that Mr. Debenham should expose some plates for Mr. Henderson to develop and thus prove his statement.

In answer to a query concerning the principle involved in anti-halation plates, Mr. Debenham replied that the light passing through the film was absorbed in the backing.

PHOTOGRAPHIC CLUB.

May 29,—Mr. Bellot in the chair.

Mr. Bedding announced the death of Mr. B. J. Sayce, of Liverpool, who was an honorary member of the Club, and proposed that a vote of condolence be sent to the family on behalf of the Club.

Mr. J. Nesbit seconded the proposition, which was carried.

The Chairman asked the opinion of members upon the following:—It was reported that Herr Max Wolf, of Heidelberg, was of opinion that gelatine dry plates increased in rapidity three or four times after keeping a few months, then diminished.

Mr. Dunmore was of opinion that a properly made plate would not alter in rapidity. Mr. Dunmore further said he had recently had a curious experience

—a plate which had been in a double back for twelve months appeared to be very greasy, the developer would not remain on the surface.

A similar experience had not befallen any member present.

Mr. Crofton showed what he thought to be a Daguerreotype.

Mr. FRY and Mr. COWAN thought it was a collodion picture on ferrotype.

Mr. NESBIT was of opinion that it was a genuine one, as also was Mr. BEDDING.

To settle the question, Mr. COWAN offered to rebind it if Mr. Crofton would allow it to be opened.

This was done, and it was found to be a silvered copper plate, showing that it was a Daguerreotype.

A question from the box read as follows: "Is it advisable to add ammonia to a chrome-alum solution in order to neutralise acidity before use? Does the ammonia destroy its efficacy in hardening gelatine?"

Mr. COWAN said it was not, and it would destroy its efficacy if much was added.

Mr. FRY said that chrome alum was an acid solution, and would remain so.

Mr. WELLINGTON questioned the advisability of using chrome alum. He preferred soda alum, for the reason that it was more soluble.

Mr. SINCLAIR asked what the ordinary alum was, and was answered that it was potash alum.

Hackney Photographic Society.—May 28, Mr. William Rawlings presiding.—Members' work was shown by Messrs. Dynam, Guest, Gardner, and Grant. In reference to some mezzotype prints shown, the CHAIRMAN said that mezzotype paper required not only strong negatives, but the subjects should be those consisting of broad masses and not of fine details. Mr. E. H. Hobbs, of the European Blair Camera Company, showed some of that firm's hand cameras, chief of which being various sizes of the "Hawkeye" and "Bullseye." Dr. GERARD SMITH then gave a lecture on the carbon process, and successfully demonstrated the single and double transfer methods. He said that many refrained from taking up this process on the supposition that it was difficult and entailed a lot of trouble. He thought so himself at first, but after mastering the details he found it not to be as difficult after all, and certainly thought that the results obtainable fully worth any trouble that might be taken to produce them.

North Middlesex Photographic Society.—May 27, the President (Mr. J. W. Marchant) in the chair.—Mr. W. E. DEBENHAM discoursed on *Lighting and Posing in Photographic Portraiture.* The lighting of the subject should be such that the form is shown both by contrast between lights and shadows and by full gradation between them. To secure these conditions the angle of light must be large, but not excessive. As examples of the two extremes, he mentioned the case of a man standing on an open heath and of a sitter illuminated by a point or flash of light, or by a distant window. Speaking first of the case of a man on the heath, he pointed out the modifications of effect caused by adjacent buildings, walls, or trees, until, in certain cases, as good effects might be obtained as in a studio. The case of a sitter in a private room was next considered, and the means indicated by which satisfactory portraits might be obtained in them. Several examples of this class of portraiture were shown. Studio lighting of the ordinary and of the Rembrandt style were described; examples of these were also shown. With regard to posing, several hints were given, both as to single figures and groups. Amongst the limitations, that to variations of size caused by perspective was dealt with, and the lecturer advised that portions in which the effect of perspective in proportion was very evident should be avoided, as, although they might be strictly true in perspective, still artists had not accustomed the public to see this perspective effect, and the public judge of pictorial representations not so much by referring them to nature, but to other pictorial representations to which they had been accustomed. At the conclusion of Mr. Debenham's paper a lengthy discussion ensued, the lecturer then coming in for a very warm vote of thanks, the attendance being a very large one, between sixty and seventy.

Liverpool Amateur Photographic Association.—An Extraordinary General Meeting of the above Association was held in the Club-rooms on Thursday evening, May 30, for the purpose of appointing a new Hon. Secretary in place of Mr. John H. Welch, resigned. Mr. F. A. Schierwatie was appointed to the vacant post. At the end of this meeting the ordinary monthly meeting of the Association was held, the President (Mr. George B. Newton) in the chair. The minutes of the last monthly meeting were read, confirmed, and signed by the Chairman. A vote of thanks to the retiring Secretary for his past services was carried unanimously. A letter was read from Mr. R. Rawlinson, proposing that an investigation Committee should be appointed, and the members were asked to think the matter over, and communicate their ideas to the Hon. Secretary. Mr. ALFRED TYRER referred to the loss the Association had sustained in the death of Mr. B. J. Sayce, and proposed the following resolution, which was seconded by Mr. PAUL LANGE and carried unanimously:—"That this meeting desires to express its sincere and heartfelt sympathy with the widow and family of the late Mr. B. J. Sayce, who was one of the founders of the Association, and at the time of his decease was a prominent and ever-welcome member, whose genial manner and kind assistance endeared him to old and young alike. That a copy of this resolution be forwarded to Mrs. Sayce." A letter was read from Mr. A. W. Beer also referring to the great loss the Association and the photographic world at large had sustained by the death of Mr. Sayce. The PRESIDENT regretted that he had another death to announce, that of Mr. J. Samuel, who died since the last meeting. Mrs. Lister was elected a member of the Association. Mr. GEORGE E. THOMPSON was then called upon to give his lecture entitled, *The Valley of the Wye.* Both the lecture and slides were in Mr. Thompson's well-known style, though the former was cut rather short on account of the close evening.

Photographic Society of Ireland.—The Annual Meeting of this Society was held in their rooms at 35, Dawson-street, on Thursday evening, May 23 Professor Scott presiding.—The SECRETARY (Mr. J. A. C. Ruthven) submitted the report of the proceedings for the year, and referred to the successful meeting of the Photographic Convention of the United Kingdom in Dublin last July. Afterwards the election of officers for the ensuing year took place with following result:—*President:* Mr. J. A. Scott, M.D.—*Vice-Presidents:* Messrs. Alfred Werner and Leonard Strangways, M.A.—*Council:* (five elected) Messrs. E. MacDowel Cosgrave, M.D., J. H. Hargrave, M.E., J. R. Simpson, V. E. Smyth, and H. Goodwille; (members of Council retaining their seats for another year) Messrs. R. M. Inglis, A. M. Geddis, F. J. Richardson J. H. Woodworth, and J. M. Keogh.—*Hon. Treasurer:* Mr. William Bewley B.A.—*Hon. Secretary:* Mr. J. A. C. Ruthven, M.I.C.E.

FORTHCOMING EXHIBITION.

1895.		
June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PAPER NEGATIVES.

To the EDITOR.

SIR,—I have noticed in THE BRITISH JOURNAL OF PHOTOGRAPHY one or two expressions of regret for the old negative paper which preceded the transparent film, and so much excelled it in the matter of permanent sensitiveness; and in my heart I responded, Amen. Finding in a drawer—where they had lain for years—rolls of the old Eastman negative paper, and the later stripping film, the former marked December, 1885, and the latter not less than six or seven years in my possession, I concluded to try them and test the keeping qualities. I enclose you the results of the four trials, two of each kind of paper, exposed by guess and developed with pyro, only taking the precaution to soak them well in the pyro solution with a few drops of bromide previous to adding any alkali, and then adding a little carbonate of potash. The development was done with no especial care, and rather in a hurry, so that the slight inequalities in the skies of one or two are probably due more to the development than any other cause. Will you allow them to be seen by any amateur who may be interested in the subject? and perhaps you may be disposed to express your own opinion on their merits—as material, and not as negatives—for they have no interest in the latter sense, being merely the view from the terrace of onr photographic club, where I usually test my plates and lenses. I do not know if the "strippers" would strip, or if there be any defect in the printing qualities of the paper, as I have not had time to print them, but I think that they work out about as they used to when new.—I am, yours, &c.,

W. J. STILLMAN.

[The paper negatives sent are exceedingly good.—ED.]

FIXING.

To the EDITOR.

SIR,—The following words occur in your leader of this week—"That very considerable traces of the developer remain in the body of the gelatine film after the comparatively short washing generally given to negatives previous to fixing is clearly demonstrated by the rapidity with which the fixing bath itself becomes discoloured." The idea of obtaining from the behaviour of the fixing bath itself, after the operation of fixing is over, indications of the successful character or otherwise of this operation has been present to my mind for some time, in relation to the fixation of albumen paper prints, and especially since the publication of the recent valuable researches into the various reactions in the hypo bath during and after fixing. In common perhaps with the great mass of professional men, I have for many years used the acetate of soda toning bath for albumenised paper, and it has been a matter of common experience to find the fixing bath if kept over for twenty-four hours become turbid and dirty-looking. The usual amount of washing given to prints after toning is frequently, I am afraid, much too scanty, and even when prolonged, there is probably something more than a trace of the acetate of soda carried into the fixing bath. To the effect of this on the hypo is probably due much of the turbidity noticed after keeping. May it not also be

responsible for the fading or yellowing of many prints? To neutralise the weak organic acid of the acetate, an addition to the fixing bath of some alkali, such as carbonate of soda or ammonia, has been recommended; but it has often struck me that an alkali bath, intermediate between the toning and fixing, would be much safer and more scientific. I have latterly therefore used a weak ammonia bath—about one ounce liquor ammoniæ to three gallons of water—and the result, as gauged by the appearance of the hypo bath the day after use, seems to show its usefulness, the discolouration and turbidity being much less. There is, however, one drawback; weak as the alkali is, it seems to affect the sizing of the paper, and the prints look more transparent whilst wet, and lose a little of their brilliancy when dry.

Have any of your readers experimented in this direction?—I am, yours, &c., P.

IDENTIFICATION BY PHOTOGRAPHY.

To the EDITOR.

SIR,—In relation to the sneer which is embodied in the paragraph appearing in the JOURNAL of May 31, it is not the intention of the present writer, at whom chiefly the shaft is aimed, to say one word in any shape or form. He begs only permission to tell the paragraphist that, although he is neither deaf nor blind to what is going forward, he elects at present to be *dumb* touching the very ostentatiously advertised "confession" of the Tichborne Claimant. A leaderette in *The People*, significantly alleges that the confession has "all the importance of a *State Paper*," and the *Westminster Gazette* supplements the information with the business-like observation that it has been obtained for a *consideration*. Thus the atmosphere becomes clearer, for both of these newspapers are undoubtedly well informed, and the source of the financing of the "confession" stands revealed. In any case, it must be admitted that the Claimant has now taken the politic course of averting approaching destitution by accepting the conditions imposed upon him by the negotiators.—I am, yours, &c.,

THE ORIGINATOR OF THE GEOMETRIC METHOD.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

FUGITIVE.—See leader on the subject on another page. A case almost identical with yours is referred to.

F. R. W. W.—Spotting colours specially prepared for the purpose are supplied. Mr. Rudowsky, Guildhall-chambers, E.C., and others supply them.

F. MOTLEY.—We should advise you to apply where the powder was supplied for the method of using it. We cannot say ourselves, and it is nothing whatever to do with photography.

R. C. T.—Better send us a sketch of the proposed studio, with the aspect and dimensions marked upon it; we shall then be able to give an opinion. From the description sent we are not at all clear as to what is proposed to be done in the way of alteration.

T. FORESTER.—Although the triplet lens is an excellent one for copying purposes, it is not considered so good for general outdoor work as the more modern lenses—"rapids." With outdoor work, under some conditions, the triplet is liable to give a flare spot.

F. HOLMES.—Refer to the ALMANAC for 1889; in that there are several formulæ for ferro-prussiate papers and for other iron printing processes, which are fully treated upon. As you do not mention how the sample of paper sent was prepared, we cannot say for what it is adapted.

GEO. SANDS says: "I should feel extremely obliged if you would give me a receipt for preparing an effective retouching medium for gelatine dry-plate negatives."—A formula for a retouching medium, and also one for a retouching varnish, are given in the ALMANAC for the current year.

BERKS.—The defect in the centre of the pictures is caused by the lens. It is what is known as a "flare spot." There are different ways of remedying it, but we should recommend you to return the lens with one or two of the photographs to the maker, and he will put the matter right for you.

C. TAYLOR.—The trouble is due to the sensitising bath being too weak. It may have been fifty grains to the ounce, but there is little doubt that it is not of that strength now, or at least when the paper was floated upon it. Test it and then make it up to the original strength. There appears to be no fault in the paper.

T. A. H.—If the camera has dropped to pieces through being stored in a hot place, we expect you will have to get a new one. With a twenty-five shilling set, all complete, very substantial work cannot be expected, neither can well-seasoned wood. We are afraid the maker will not make any allowance, considering you have had it a couple of years.

O. G.—1. The quantity depends upon the amount of acid in the chloride, but an excess of chalk does no harm. If the acetate of soda toning bath be made a day or two before it is used, there is no actual need for neutralisation. 2. It is not usual with the developer named for the image to be so long before it appears, supposing, of course, that it is sufficiently exposed.

H. H. H.—It is quite a fallacy to suppose that the fine reproductions of paintings produced on the Continent are photographed from monochromes specially painted for copying. That system was practised to a limited extent many years ago, or, at least, it was said to have been done. The reproductions in question are all from the original paintings, whatever you may be told to the contrary.

W. SIMPKINS.—The prints show no fault in the lens, even if there be any. The camera has moved so much in each case during the exposure that, however good the lens may be, the image is so blurred that all detail is destroyed. If there is any doubt about the lens, take a picture with it, accurately focussed, with a stand camera. Unless the camera is absolutely steady during the exposure, no lens can yield a sharp image.

A. JENKIN.—It is not at all necessary that an agreement should be drawn out by a solicitor to make it a legal document. Whether it is or is not, you agreed to its terms and signed it. Before departing from it, we should advise you to consult a solicitor. The distance you are prohibited from working in would very likely be considered an "undue restriction of trade." As for the stamp, if that is insufficient, a proper one can be affixed by paying a fee as a penalty.

XENO.—The portraits appear to be lighted by a nearly direct front light, and if they are a sample of your regular work, we must say we are not at all surprised that your sitters complain, or that they demur to pay for resittings. You cannot expect sitters who pay for their portraits to "make allowances for a young beginner." People expect good photographs when they pay for them. We should advise you to get instruction from some one who is proficient in portraiture.

AMATEUR says: "Will you kindly inform me which is the best lens to use to photograph a four-in-hand coach loaded with passengers, and also which is the best point of view to take it from? I have a rapid rectilinear lens—can I make use of that?"—In reply: 1. A lens of the rapid rectilinear type will do for the purpose. 2. Plant the camera a few yards to the right or left of the horses' heads, and take the picture in perspective.

PHANTOM writes as follows: "I am managing operator in a firm. Last Christmas I gave a friend of mine an enlargement of himself which I had executed at one of the enlarging firms, and which I paid for; all done with the knowledge of my employers. Now my friend (who has been staying with me for a fortnight) wishes me to do two more enlargements of friends of his for which he will pay me, as he (being very wealthy) wishes me to make something for myself out of it. What course should I adopt? If I pass the order through the firm they will get all (and do nothing), while I shall get twenty per cent. which I am entitled to on profit. If I get the order executed on my own responsibility and make something out of it, should I be acting within my rights? I should like to have your opinion on the above, also the opinion of others similarly situated."—In the above circumstances we do not see that our correspondent would not be within his rights; but it may be a matter of policy whether he acts upon them or not. Employers certainly do not expect their *employés* to trade on their own account, or at least without their consent.

CONTENTS.

	PAGE
THE INVENTION OF EMULSION PHOTOGRAPHY	353
GELATINE EMULSION FOR THE LIPPMANN COLOUR PROCESS	353
THE ACTION OF LIGHT ON COLOURS	355
THE CHANGES THAT PLATINUM PRINTS ARE LIABLE TO. By CHAPMAN JONES, F.I.C., F.C.S.	357
"A. P." JOTTINGS. By LESLIE SELBY	359
PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM	360
MEANS FOR MITIGATING THE FADING OF PIGMENTS. By CAPTAIN W. DE W. ABNEY, C.B., F.R.S.	361
THE DENNIS TAYLOR NEW LENS	363
OUR EDITORIAL TABLE	364
NEWS AND NOTES	364
RECENT PATENTS	364
EXCHANGE COLUMN	366
MEETINGS OF SOCIETIES	366
FORTHCOMING EXHIBITION	367
CORRESPONDENCE	367
ANSWERS TO CORRESPONDENTS	368

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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CONVENTION POSSIBILITIES.

We can see in the distance a cloud which may ultimately interfere with the fair sunshine which has all along attended the Photographic Convention of the United Kingdom. At present it is "no bigger than a man's hand," but it may spread and becloud Convention prospects to a serious extent if not provided against. We refer to the selection of places of meeting.

It is an open secret that the photographers of one important town, in which it had all but been decided the meeting of 1896 would be held, have "cried off" for the present, one reason for which has been hinted at, viz., the possible expense to which the Society may be put in entertaining their visitors, this being viewed in the light of the great generosity displayed at last year's Convention in Dublin, at which no expense, locally considered, was spared in order that the visitors might be right royally entertained, which they were, even to the extent of a handsome surplus being subsequently contributed to the Convention coffers.

The effect of this upon other societies whose financial position and prospects would not justify them in an increased expenditure, although their hearts may be warm towards the Convention, and the scenery in their neighbourhood all that is excellent, may readily be guessed. Their pride revolts at the idea of inviting the Convention to something less resplendent than that to which they imagine it has of late been accustomed. This feeling, although natural, is, we believe, not well grounded. But where lies the remedy?

It was one of the ideas of the founders of the Convention that the place of meeting should in the main be selected by such governing body as would afterwards be appointed, swayed largely by invitations from local photographers, should such be received; and, to test the working out of this idea, it was determined, while as yet the inchoate Convention only consisted of two individuals, that the first meeting should be held in Derby, and that some friend in that Midland town, the Secretary of the Society there by preference, should be requested to hire a suitable room at the cheapest possible rate in which to hold the meeting. How cordially the men of Derby received and acted upon the request, and how enjoyable the meeting turned out, both in the papers read and the excursions made, are now matters of history.

Here, then, is an idea worthy of falling back upon should need arise, which we hope will not be the case. In the event of no invitations, from whatever cause, being forthcoming, let the Convention itself fix its place of meeting after hearing all the pros and cons consequent on the, doubtless, numerous suggestions that will be made, and let the photographers, who are now as thick as blackberries *everywhere*, be made well aware that friendly service in the selection of rooms in which to meet will be thankfully received, and will entail no expense upon them either individually or collectively, the Convention Secretary or other delegate visiting the place selected previous to the date of meeting to arrange for or confirm details. Some such arrangement as we have foreshadowed would place the Convention in an independent position, and, while not losing sight of our larger cities and towns, would enable it to be held occasionally in such places as the Isle of Wight, where, we understand, there is no photographic society, or even in Jersey, where there is one, and in both of which photographers are numerous.

We have been told that it would further conduce to the success and practical character of the Convention if some of the papers read were devoted to short practical expositions of technical photography, in contradistinction to those of a more scientific nature. This leads us to inquire into the objects to be attained by Conventions. They are not intended for tuition in elementary photography. This goes as a matter of course in the presence of the numerous journals and societies now existing. They serve rather as a means for bringing together photographers from various parts of the Kingdom, and thus enabling personal acquaintance to be made with those whose names and writings are already well known, but with whose *personnel* such acquaintance is as yet the algebraical x. And we know that many pleasant acquaintances have been made at these Conventions, and in conversation many misconceptions have been dispelled. It is perfectly surprising how "chummy" some people have become who formerly imagined they were enemies, and all because, when they met and discussed their grievances, these, having been found to be without real foundation, were quickly cleared away by a *vivâ voce* interchange of sentiments.

Then the excursions! Is there nothing to be learnt by the less experienced in the artistic selection of subject by noting under what circumstances the masters in this department plant their cameras, to say nothing of the *camaraderie* that inevitably ensues when a number of good fellows are thrown together for some days in succession? The wonder would be were it otherwise. The flow of soul during the day is succeeded by the feast of reason in the evening, when one can

listen with pleasure to papers of a nature calculated to interest and instruct. A suggestion of a late member, whose death we all deplore—Mr. Adolphe Levy, C.E.—with regard to the class of papers that should be read, may perhaps be open to question. The idea of this *savant* was that the technical element in Convention papers should be discarded in favour of those of a more purely scientific nature. This has never worked well, if we judge by the reception of such papers at gatherings like those of the Royal Photographic Society, or the annual conferences of the Camera Club. Ordinary practical photographers are a little inclined to make themselves conspicuous by absence, and to vote them heavy to listen to. We have known the filling up of a blackboard with mathematical symbols, chemical notations, or curves, act upon an audience like a cry of fire. But we do not think that Mr. Levy's idea is at all likely to be carried out to any detrimental extent in the Convention. There is a middle course between what we have indicated and mere oaby twaddle through which the Council will steer their barque to the advantage of every one.

If any member believes he has something of novelty or interest to communicate to his fellow-members, he should lose no time in placing himself in communication with the Honorary Secretary.

PHOTOGRAPHING OIL PAINTINGS.

We have lately had the benefit of the experience of a photographer who has been commissioned to copy oil paintings in various parts of the country, and we think that a few hints, as to his working and manner of meeting the various difficulties in which this kind of work is so fertile, will be interesting and useful to many of our readers. Naturally, the first query we put to him was as to the actual value in practice of isochromatic plates. "They are invaluable," we were at once told. It is not found necessary to use them in all cases, but, as so many unexpected results are liable to crop up, there is no harm, and much possible benefit, from using them solely for the work. A little practice will soon show when a screen is needed, and to get the best results it is desirable to have two or three of different tones and depths of yellow, according to the predominance of yellow, green, or red, or the extent to which they are present in proportion to the rest of the picture. It is an open secret that the process-block makers, who obtain such beautiful and apparently impossible transcripts of most difficultly photographable pictures, do not produce a negative with the desired effects at once. More frequently a negative, as good as can be, with the aid of yellow or other screen, is first obtained, and a good print made from it. This print is then worked up, by a skilled hand in black and white, in such a way as to suggest the exact effect of the chiaroscuro, and of colour value of the original. It is then an easy matter to make a grain negative from which to make the block. This, however, being treatment of a subsidiary nature to that which we are specially illustrating, a passing allusion to it must suffice.

"What is the greatest difficulty you have to contend with?" we asked. "Reflections and dirt," was the ready reply. As to the latter, we were told that the amount of actual dirt on the surface of the average oil painting was surprising. That it must interfere with the brilliancy of the negative is self-evident. Every owner of oil paintings ought to have his pictures periodically—not less than once a year—subjected to a simple sponging with clean rain or distilled water by an experienced hand. Most pictures would be uninjured by any amount of judicious cleaning of this kind, but an occasional one might be met with which, if at all cracked, would suffer from the application of water. It is told of Nollekins, the great sculptor, that on one occasion, when his sitter was a King of England, he did, as usual with sculptors of permission, not keep the modelling clay moist by applying water with a syringe to the august effigy, but simply spat upon it. To similar lengths did our friend inform us that he went when photographing a painting, the owner of which literally declined to allow him to sponge it, though it was pointed out how great an accumulation of atmospheric deposit overlaid and hid the beauties of the colouring. Nothing but a clean linen cloth was allowed. Not to be beaten by a film of dirt, this enterprising photographer took from his pocket a clean handkerchief, and with it carefully dusted the picture, and the one moment the owner's back was turned Nollekins's experiment was resorted to with excellent effect, the owner of the picture, looking at it afterwards, pointing out with pride how perfectly sufficient his rule not to permit his picture to be moistened had acted in this instance!

"How about giving the painting a coating of stout, so strongly recommended by some operators?" we asked. "Those may adopt the plan who like," he said. "I never put anything saccharine or containing glycerine upon the picture, because it is, especially with old pictures, so difficult to know when the whole of the addition was removed after it had served its purpose, and a little glycerine or a little sugar left on the surface might lead to the infliction of ultimate irreparable injury. You ought to know something about oils before you tamper with them in any way." One very great difficulty frequently met with was a slight "chilling" of the surface of a varnished picture, sometimes in parts—the most troublesome form—at others over the whole surface. In the latter case, though it was not possible to obtain a first-rate negative, it would, at any rate, be even in its mode of reproduction, while, when a picture with an occasional streak or patch of chill was put before the camera, the result was a remarkable and objectionable effect of streak or patch, far away exceeding the trivial effect to the eye that the original gave. In most cases this trouble was overcome in the readiest way, but our interlocutor's views were pronounced, and they were to the effect that this or any remedy should never be undertaken without the express permission of the owner. If the photographer were one accustomed to the handling and treatment of paintings, the owner of the picture would place no difficulty in the way. If he were not so experienced, then, for his own and the owner's sake, he should leave it alone, for, though in nineteen cases out of twenty his interference would produce no evil, it might in the twentieth be hurtful to a greater or less degree.

A description of how the gentleman whose experience we are narrating proceeded in cases of "chilling" and other difficulties we shall leave to a future occasion.

The Photographic Star Map.—An account of the present state of this great undertaking is to be found in the third part of the *Bulletin* of the International Permanent Committee. An immense number of plates for catalogue purposes have been taken, 753 coming from Paris and 1562 from the Cape, among other places. For the actual map not one-third of the photographs are yet taken.

this being due to the long exposures needed for the efficient production of suitable negatives.

The Sun's Seasonal Power.—It is evident, from what we have written, that the personal equation will be the chief element in weather lore, but it is in the power of any one to collect data of a useful nature as they appear. Among them must be classed a year's observation of the sun's power, made at a Russian station, and recorded by J. Schukewitch. The results are unexpected; he finds the intensity of the sun's radiation, when unclouded at noon, to possess a maximum in April and a secondary maximum in September, the chief maximum being in November.

Classification of Glass as to Hardness.—Up to the present time there has been no recognised system of classifying the various degrees of the hardness of different glasses. As it may be interesting to some of our readers, we give details of a list, which, in an illustrated form, can be obtained from the dealers in apparatus:—No. 1, The softest glass in commerce—French crystal; 2, soft Thuringian glass used for artificial flowers, toys, &c.—English crystal; 3, hard Thuringian glass, used for thermometers, finer apparatus, &c.; 4, Jena normal thermometer glass—XVI.''' of Schott & Co.; 5. French hard crystal, used in Paris for normal thermometers; 6, Jena boro-silicate thermometer glass free from alkalies—122''' of Schott & Co.; 8, Cavalier's Bohemian crystal glass, used for combustion tubes.

The Shahzada and Photography.—Comments have been freely made in the daily press that our youthful visitor seems to take but little interest in what he sees. This, however, clearly does not apply to photography, for we learn that, on the occasion of some groups being taken at Dorchester House on his return from the City the other day, he was highly interested in the work. When shown a hand camera, and it being explained to him the picture was taken by merely pressing the small knob, he seemed a little sceptical, and insisted on putting the thing to the test by taking his little pageboy as he was coming down the steps. With strict Mohammedans photography is not much in favour, or used not to be, so far as portraiture is concerned. Some have the greatest objection to their portraits being taken, they considering that it was against the teaching of the Koran. However, more liberal views are now held by the majority. Photographers are to accompany the Shahzada on his provincial tour to secure mementoes of the visits.

Gas Cylinders at the Pole.—The funds required by M. Andree, the Swedish engineer, to equip his balloon expedition to the North Pole have now been raised. The balloon will, it is stated, be capable of carrying three people, four months' provisions, a sledge, boat, photographic apparatus, &c. The aeronaut estimates that from 1700 to 1800 cylinders of gas under a pressure of from 100 to 200 atmospheres will be required for the expedition, to fill up the balloon from time to time—rather a big order this. It is said that the balloon is to be sufficiently gas-tight to remain in the air for thirty days, at an altitude of 250 mètres. The balloon will be made with a double thickness of silk instead of the usual single thickness. Of course, such a novel expedition as this has brought forth many comments in the scientific world; and not a few are sceptical as toits success, while others are sanguine about it. Anyhow, it is a novel enterprise, and the result will be watched with interest.

Weather Forecasting.—Mr. Thos. Russell, U.S. Assistant Engineer, has recently published a work bearing upon this subject. The opinions he gives and the statement she makes, as regards the possibility of foretelling the probable weather are disappointing in the extreme. Could the science of meteorology be brought to the point of perfection hoped for and believed in by many, its advantages would be incalculable to the photographer, who sometimes has to wait for weeks in the daily hopes of getting suitable atmospheric conditions for his work, but who then would merely start when the weather prophet bid him look for a fine morrow. But Mr. Russell, working with data from an immense region, under conditions far superior to anything possible in this sea-girt isle, says there are not more than a dozen occasions in a twelvemonth when successful predictions can be made, and for some places successful predictions are never possible. This, be it remembered, in a country where there is a free and bounteous hand holding the purse strings, an extensive telegraphic system, and power of collecting data from a district wide enough to embrace the whole of a storm area. It is disappointing, but perhaps there may be some hope even yet of our wishes being realised.

The Orthochromatic Vendor.—Mr. Watmough Webster has evidently, as will have been seen from our correspondence columns, been a public benefactor in drawing attention to the wiles of this gentleman. He forwards us also the following letter which he has received, and which will, we should judge, effectually prevent further operations by this *chevalier*. For obvious reasons, the sender's name is omitted:—

"Dear Mr. Webster,—I was very much interested and amused to see your letter in last week's BRITISH JOURNAL OF PHOTOGRAPHY, as it reminded me so much of a "dear friend" who came to see me in 1891, in France. By this week's JOURNAL, I am sure he is one and the same as your Dr. Morway. I knew him in France under the name of Captain Morgan. He said that he was a friend of Captain Abney, and wanted me to send pictures to an Anglo-American Exhibition to be opened in London that autumn. He was two months afterwards arrested in Paris for not paying his hotel bills. I give you his history according to him, and given by him to the Paris police. He belongs to a noble Hungarian family, but had fallen out with his people. He can talk twelve languages (among others, the hind leg off a donkey). His card was as under:—'Captain Edward Morgan, officier d'Instruction publique, vice-président de la Société internationale Anglo-Américaine de Photographie, directeur de l'Académie de Photographie de Londres, etc.; Ministère de l'Instruction publique, South Kensington, Londres.' He also sold Ortho. solution.—Yours very truly, ———"

JOTTINGS.

I TRUST I may be pardoned for indulging in a quiet chuckle over the little duel that has been raging during the last few weeks between Mr. W. B. Bolton and Mr. G. E. Brown. My readers will remember that both gentlemen undertook to correct me and each other in reference to the calculation of the alkalimetrical equivalents, a table of which I gave some time ago. The original point at issue seems to have been lost sight of, and now these undoubtedly accomplished writers are strenuously attempting to prove that the other of the pair knows little or nothing about chemistry or chemical arithmetic and calculations. With all its faults and errors, Londe's table does not appear to be any more wide of the mark than is Mr. Bolton's (according to Mr. Brown) or Mr. Brown's (according to Mr. Bolton). Moral: Stick to your "Cosmos," gentle reader.

The publication, on page 347 (May 31), of the questions that were set at the examination in photography conducted by the City and Guilds of London Institute on May 1 last, affords photographers an opportunity of ascertaining what their would-be schoolmasters' ideas are in relation to what constitutes a "practical" photographic knowledge. I venture to think that very few practical or professional photographers will be moved to enthusiasm or admiration by the questions put in the "ordinary" and "honours" grades of the "Pure Photography" Section. On the other hand, those set for the Photo-mechanical Process Section bear the appearance of having emanated from somebody with considerably more than a mere theoretical smattering of knowledge to guide him in the selection of his questions.

Take question 7 (ordinary grade), and mark it well. To ask a candidate how he would pose a man in ordinary costume, with the

view of obtaining a full-length portrait of him, is, I suggest, an invitation to the candidate to retort, in the Socratic fashion, "Ask me another." If the question was intended to refer to a standing figure, it should have stated so much. In that case the candidate would have been justified in replying that he would not attempt to "pose" a standing figure of a man in ordinary costume. No photographer worth his salt attempts that kind of portraiture nowadays. It never is, it never was, in the least degree satisfactory either in the pictorial, picturesque, or photographic sense. But, if the question was meant to convey that the sitter should be seated, the not unimportant fact that the "pose" must necessarily be quite determined by (1) the taste of the photographer, as influenced by (2) the shape, size, make, and character of his sitter, renders delightfully plain the utter futility of expecting any but absolutely empirical, and therefore vague, answers, which could not possibly give a clue to the real "posing" powers of the candidate.

Question 10, of the same (or "ordinary") grade, implies that the tendency of a batch of plates to give "general flatness" may be obviated, *ab initio*, by aiming at obtaining greater density, presumably in development variations. Is not this rather a roundabout way of asking how the candidate would proceed when he found he was over-exposing? Or are we to take it that "general flatness" of image is a defect always traceable to the characteristic of the plate? The question is enveloped in fog. As to No. 9—"Why does the image, as seen on the ground glass of the camera, appear (*sic*) upside down?"—one is tempted, at sight of this solitary and ludicrous question relating to photographic optics, to ask oneself some such puzzle as "Why does a dog wag his tail? *Answer:* Because the tail can't wag the dog."

As to the nine questions set for the "honours" grade, I humbly submit that, if they were intended to test the knowledge of a candidate who had serious thoughts of engaging in photography as a profession, they, or most of them, are worse than useless. The examiner asks or the candidate's opinion as to the cause, prevention, and cure of "green" fog. Now, green fog is a phenomenon concerning which we have all our own pet opinions, and as to the cause of which no two persons are agreed, while, as to its prevention and cure, it is ridiculous to talk of the one and idle to suggest the other. Again, why on earth ask for a description of the "Diazotype" process—a process which never was, and possibly never will be, practically availed of? Why, too, ask for "the 'different' methods used for producing stereoscopic effect on the screen by means of the optical lantern" when it is well known to everybody (except the author of the question) that only *one* method, *i.e.*, Mr. John Anderton's, has been used for very many years past? Inasmuch as a practical examination is held, in addition to the paper, in each section, the only further comment I have to make upon these remarkable questions is that they might very well have been dispensed with. As tests for practical or theoretical knowledge they are quite unsatisfactory.

Colour photography, according to the Lippmann-Lumière method, has formed the subject of discussion at more than one recent Photographic Society meeting, and the point has been raised as to whether, granting the capability of the process for translating, with approximate correctness, the spectrum band, this qualifies it for being regarded as fulfilling the requirements of a process for nature subjects. Theoretically, the correct reproduction of the spectrum stamps the process as a scientifically practicable one, giving, as it were, the key to the ultimate solution of the direct colour-photograph problem. *Per contra*, it is argued, by those to whose opinions applied knowledge and practical skill impart weight, that, however well the process may come out in its attack on pure colours, it must, and should be judged only by its power to render nature subjects, that is, those with impure or rather mixed colours.

I would as soon write disrespectfully of the solar spectrum as of the equator or our grand and glorious constitution, but I must own to having considerable sympathy with the latter of the two views. The fact is, the spectrum finds its chief use in enabling the experimentalist to refute or substantiate the theories he sets himself to examine, and, however perfectly it may be reproduced by the Lippmann or any other plan, affords very little reliable indication as to how the process used will behave in practice. Mr. Andrew Pringle's remark (I quote from memory) that the spectrum does not hang on trees concentrates much practical wisdom in a small space, and was, if my memory serves me right, indirectly but thoroughly confirmed by the results which Messrs. Lumière sent over to this country last October twelve months. Among these was, I believe, a spectrum, with which, on the score of brilliancy and truth, little or no fault could be found; but the nature subjects, though they, on the whole, were remarkably good, were open to very serious objection in all respects save where the reproduction of the yellow was conserved.

The May number of *Jottings*, the Hackney Society's journal, contains a brief address to the members by the new President (Mr. Wall), from which I take leave to make a short quotation. He pleads for specialisation in photographic work, and the advice he gives is of universal application. "Photography," he says, "is far more interesting when you specialise. Take up the subject of river bridges, the forms of trees, plants, flowers, stereoscopic work, photo-micrography, copying of pictures, &c., anything, so long as you work with a purpose, and work earnestly. To do this, you must dip into contemporary sciences, into other fields, and your views are broadened, and you gain in education. Coming now to specialisation in technical work, I would say, Choose some process—take, for instance, a printing process—thrash the subject out, learn all you can about it, work at it till you are perfect, then take up some other branch and work at that in the same way; by doing so, you will become masters of more than one subject, and not Jack of all."

The modern amateur will find this good and sound advice. One has only to take a cursory glance at the many distinct and, so to say, antagonistic branches into which photography to-day has split itself up to realise the complete impossibility of one individual becoming master of all, or excelling in any but a comparatively small number. The best-known men, the most able, have succeeded by specialising their work and its aims. Even in the comparatively minor branch of photographic work, picture-making by photography, —it will be found that subdivided specialisation has led to the greatest individual successes. One man devotes himself to seascapes, another to landscapes with cattle, a third to figure and portrait work, a fourth to cloud studies; another to hand-camera studies; a sixth to architecture and interiors, and so on down the list. The man who dabbles in all these branches of pictorial work does not often leap into conspicuous success in any one of them.

The more utilitarian or scientific side of photography furnishes so many forcible illustrations of the value of specialisation in photographic work—the names of those who are noted for having mastered a particular subject by sticking to it, and it alone, will so readily occur to the reader—that it is unnecessary for me to give them here; but, in urging the new and the newest amateurs to go and do likewise, I also wish to place the hint in sight of our professional friends. To many of them, compelled by the hard necessities of their positions to undertake all or any kind of work they can get hold of, it would, I know, be sheer mockery to suggest specialisation; but to others on a somewhat higher plane—those whose businesses might be described as of the only fairly satisfactory or profitable kind—it is a moot point whether not only the quality of the work they turn out would not be improved, but also their bankers' balances, by an assiduous cultivation of fewer branches of work. The professional who undertakes every kind of photography is something like the amateur similarly affected—he rarely excels in any one department. At any rate, this is what my observation tells me.

I hope the summer excursion to Matlock and district of the National Association of Professional Photographers, which is being

held this week, has resulted in a large attendance and a pleasant time, although on the first score I have grave doubts. I cannot help thinking that the National Association of Professional Photographers would have done better to join forces with the Photographic Convention, the meetings of which are attended by many professionals, and so make the older reunion larger and more successful, instead of indulging in a hole-and-corner outing on their own account. I am sure the Convention would welcome the National Association of Professional Photographers, and I am equally sure that the members of the latter would carry with them through the year none but the pleasantest recollections of their Convention experiences. The dislike of the amateur, the antagonism to the dealer and manufacturer, which I suppose is at the bottom of the National Association of Professional Photographers' self-isolation, can do neither that misanthropic body nor professionals generally the least good—on the contrary, it does harm by perpetuating, as it were, hostile feelings between various classes of photographers, whose interests in the main are identical, and who should therefore unite in promoting the progress and well-being of the art we all love so well.

As I have endeavoured for a long time past to follow the successive developments of the Free Portrait scheme, and am anxious to make the record complete, I give the latest circular that is being distributed by guileless tradesmen as an inducement to their customers to buy early and often. Here it is:—

"Life-sized Portraits Given Away.—As a premium for cash trade, according to the following conditions: With every 2*l.* worth of cash purchases at our store you will be entitled, free, to one elegant life-sized Aerinda portrait, copied from any photo you may select, and finished in the most artistic manner, and of the same quality which commands, at retail, 3*l.* These Aerinda portraits we positively guarantee are all made by the Merchants' Portrait Company, Limited, 106 to 110, Kentish Town-road, London, N.W., who are the originators of the Aerinda portraits, and who, in order to guard against inferior imitations of their celebrated productions, have copyrighted the name 'Aerinda.' The reputation of this Company for portraiture of the highest excellence is unsurpassed, and, in order to further advertise their work, and upon our agreeing to use their Aerinda portraits exclusively in our business, they guarantee our customers not only as to the artistic merit of the work, but also the likeness and durability. Their work will please you and it will last. In order to see that their portraits are suitably and properly framed, this Company furnish their own frames, and have made it conditional upon us that with each portrait we sell a frame, an assortment of which we shall keep at 14*s.* each and upwards, subject to your own selection as to style and quality. We give you the portrait free. You pay for the frame only."

The *naïveté* and delicious charm of the last two lines defy betterment. I wonder how long a fond and foolish public will swallow this kind of thing, and why photographers, in every locality where the hydra-headed free-portraitist appears, do not combine to put the scheme before the world in the cold, true light of actuality?

Process Work, Messrs. Penrose & Co's admirable little monthly photo-mechanical bulletin, has a column devoted to process patents. The block comprising the title-piece depicts what is, I suppose, intended to suggest the entrance to the British Patent Office. Borrowing a hint from Dante's *Lasciate ogni speranza* inscription over the entrance to another (and warmer) place, Messrs. Penrose print the following legend above their Patent Office door, "Abandon hope, all ye who enter here." I suggest that this adjuration is of a needlessly disheartening and despondent character, and beg to submit an alternative inscription—thus, "Let hope spring eternal in the human (patentee's) breast." Under our supremely dishonest and indifferentist patent laws the best thing a man with a (to him) patentable idea can do is to take out his patent, trust to luck, and hope that it may never incur the disagreeable attentions or doubts of some inquisitive sceptic, such as the editor of The British J——, but no matter!

Cosmos.

GELATINO-CHLORIDE UP TO DATE.

There is little doubt but that much of the uncertainty complained of by a correspondent in the working of gelatino-chloride paper is rightly attributed by Mr. Dunmore to variations in the condition of the toning bath, both as to temperature and degree of ripeness; but, in addition, I would suggest that the preliminary washing has also a very material effect, not only on the character of the tone, but also on the extent of change that occurs in fixing.

With regard to the toning bath, my deductions from a number of experiments, made chiefly with the phosphate bath, are that a bath freshly made, and used within a few minutes, tones with great rapidity, and sometimes, though not always, to a good and even colour; but that the prints go down a great deal in fixing, and the tone also goes back in some cases from a rich purple to a dirty red brown. Moreover, although all may be right as regards colour and evenness before fixing, the prints are often what a friend described as "piebald" after; in other words, mealy and irregular.

A bath that has stood some hours tones very evenly and nicely, but too slowly; the colour stands in the fixing and the prints do not come down much, but it is difficult to get the deep shadows beyond a certain stage, and consequently the result is often warm shadows and grey lights. A happy medium in the age of the bath seems best, say, if newly made, from one to two hours. But I have adopted the practice of keeping my bath from day to day, and if uncoloured adding sufficient gold for the prints to be toned, and, so long as it tones satisfactorily, *no more phosphate.* Should the action get slow when I know the gold is not exhausted, I add a little more from the stock phosphate bottle and proceed. If the old solution is *much* discoloured, I add sufficient of it to the new bath to just faintly tint it and let it stand an hour, when the colour will have disappeared and the bath will be in capital working order.

As regards the proportion of phosphate of soda to gold, I have been using from twenty grains to as much as thirty grains of the former to one of the latter, making the solution up to ten ounces For some time I fancied I preferred the larger quantity, but I found my tones getting too blue after fixing, in fact, they seemed to go further instead of going back, so I have reduced my proportions to twenty-four grains to one of gold with beneficial results. One grain of gold to ten ounces of water is, to my thinking, quite strong enough and better than one to eight, being both more regular in action with out being much slower, and giving also better tones. What sort of tones are produced by those who use one grain of gold to two water I cannot imagine, but they must be easily satisfied.

By the way, before leaving this part of the question, the Solio people in their instructions recognise the importance of uniformity in the toning conditions, both as to temperature and alkalinity, and recommend the constant use of the thermometer and litmus paper for the other. Now, I have had a good deal to do with litmus paper, since the old bath days, and I know it is very useful for the purpos of telling whether your bath is acid or alkaline. But I should very much like to know how to use it, so as to tell *how* acid or *how* alkaline it is. In fact, I want to know how to keep the toning bath at a regular degree of alkalinity by the use of litmus paper. By titrating a measured quantity of the bath with a prepared standard solution of litmus, a *chemist* might make a guess somewhere near the mark, but not the ordinary photographer.

With regard to the preliminary washing, I feel sure this has more to do with the irregularities than perhaps the toning bath. Mr. W. K. Burton years ago showed that albumen prints not only took better tones, but stood the fixing bath better when thoroughly washed in plain water than when only partially washed or treated to a bath of salt. His experiments, I think, referred to ready-sensitised paper, that is to say, to paper closely resembling the gelatino-chloride in its composition. I have proved that exactly the same conditions prevail with regard to gelatine papers.

I for some time used the salt bath until I began to suspect it of causing a great falling away in the fixing bath; in fact, unless I printed *much* deeper than necessary, the proofs were quite "washed out" after fixing. I then cut four prints each into three sections, washed one piece of each in plain soft water, ten changes, another piece of each had only three changes, while the third had ten changes with a weak salt bath after the third. Each print was toned separately, that is to say, the three sections of each were placed in the toning bath and taken out together.

Result, the simply and thoroughly washed in every way the best; the salted came next, regular in tone, but much brought down; while the short washing resulted in irregularity and mealiness.

In conclusion, may I ask if there is any chance of the paper-makers responding to the suggestion made a short time back that they should give us trimmed sizes? They seem to purposely shirk the question. The first firm that does shall have my custom.

W. Lindsay.

THE EXHIBITION OF THE PARIS PHOTO CLUB, WITH SOME REMARKS UPON THE POSITION OF PICTORIAL PHOTOGRAPHY IN FRANCE.*

It may be said that I am endeavouring to accomplish a *tour de force* in noticing and criticising an exhibition which I have not seen. But I claim to do no more than draw attention to a few points of interest and general information which may easily be gathered from the knowledge which I have of a certain number of the exhibits, and from the notices in the Continental press which have passed through my hands. At any rate, in default of a better-informed report, I may be able to supply some general notes which may not be without value, concerning an exhibition which is decidedly of importance in the present condition of pictorial photography.

By common consent it is allowed that to our own country belongs the credit of the initiation and dissemination of ideas which have resulted in what is little else than a revolution in the current of feeling with which, nowadays, the pictorial photograph is regarded. We have, therefore, an especial interest in watching the effects produced in other countries by what we may, without undue pride, be permitted to call our teaching, exemplified as it has now been on several occasions by such exhibitions as those of Vienna, of Brussels, and, for the last two years, of Paris.

To begin with a few statistics. Out of a total of 620 works exhibited by 218 exhibitors, the very respectable number of 134 pictures was contributed by 44 English artists. For the most part these exhibitors and their works are well known to us in England—to the photographic world, at least—a fact, however, which does not, perhaps, imply such universal renown as we often fondly imagine. The full list of English exhibitors was as follows:—Anckhorn (2), Ashton (3), Baker (7), Bennington (2), H. W. Bennett (2), Bergheim (8), Brownrigg (5), Burchett (4), Mrs. Cadby (1), Cadby (3), Calland (2), Caswall Smith (2), Cembrano (3), Cohen (6), Craig Annan (7), Crooke (4), Davis (6), Davison (4), Fellows (1), Gambier Bolton (6), Gear (2), Greger (4), Griffiths (2), Hankins (3), H. M. Hastings (1), Horsley-Hinton (2), Job (1), Kapteyn (4), Lambert (2), Lintott (3), Selby (4), Lysaght (2), Maitland (2), Manly (2), Maskell (3), Moss (2), Norton (3), H. P. Robinson (1), Stoddart (2), Thomas (6), West (1), Wilkinson (1). It is understood that an enormous number of photographs were sent in to the Committee of Selection. I have not the figures at hand, but I believe I am not far wrong in placing them at five times the number selected. I cannot also be absolutely sure, but I think I am right in stating that none of those sent from England were rejected. The Jury of Admission was composed of 6 painters, 1 engraver, 1 sculptor, 1 inspector of fine arts, and 2 amateur photographers. Whether a selection committee of this kind (a system which we do not follow at home) is one likely to be the best qualified is, I think, doubtful, at any rate in the present condition of photographic art. It would, however, be interesting first to know whether capabilities in other graphic arts are general amongst photographers on the Continent as they undoubtedly are in no small degree amongst ourselves. The number of works permitted to be sent in by any one exhibitor was limited to ten. The catalogue was a handsomely printed volume in large octavo, illustrated with twenty-five process blocks of photographs; not, however, of pictures exhibited, but apparently selected for other reasons, possibly because the blocks already existed. Concerning these illustrations, the less said perhaps the better. Without exception they appeared to me to be more conspicuous as illustrative of what should *not* appear at an exhibition professedly devoted to art in photography than as examples of what we ought and might expect to see. For one who had only these specimens from which to form a judgment of pictorial photography at the exhibition of the Photo Club, an erroneous conclusion would be inevitable. For the most part purely topographical, or of the snap-shot order, there are some which, in such a connexion, can only be characterised as *ignobles*. Not one, it must be hoped, would have been allowed to figure on the walls. Why, then, place them prominently forward in the catalogue?

The exhibition was the second of the annual series inaugurated last year. This year a far better gallery was chosen. I had occasion in my short report of the first exhibition to remark upon the very inadequate manner in which the pictures were hung. They were loosely suspended on the walls, seemingly without arrangement of any kind, covering the space even down to the floor level. This year, I understand that great improvements were effected, but I notice that the catalogue still keeps to the alphabetical arrangement according to exhibitors' names. Such a plan inevitably causes confusion, and renders it difficult to discover the works of any particular artist we may be in search of without wading through a mass of others which probably present no interest. The exhibitions of the Photo Club are organized in many ways on the model of our own Salon, but although we ourselves have been reproached with admitting work which, in the interests of art it would be better to refuse, in Paris, if we may judge from the titles in the catalogue and from the critical notices, a good half of the 620 photographs exhibited would have honoured the gallery more by their absence. Landscapes with large bare expanses of false white sky are not nowadays seen with us even at exhibitions where manipulative skill apart from artistic may perhaps expect recognition, but I gathered that they were not infrequent in Paris.

Enlargement from snap-shots still appears to possess, for some minds, artistic merit by itself, a subject upon which I have had occasion to comment when noticing the preface to the catalogue, and one cannot help forming a conclusion as to the character of some exhibits from such frequent entries as, for instance, *The Mosque of Omar*, *Buckingham Palace*, *The Parthenon*, *Trouville*, *General View in Brittany*, and so on; fictitious titles, I admit, and possibly I may be in error and may be maligning works of high art. In making observations of the kind, I hope it will be understood that it is with the object of showing the difference in views held at two exhibitions which profess the same aim; I mean that of the Photo Club and that of our Salon. I do not propose to uphold the one or condemn the other.

The Photo Club rightly gives no medals or distinctions, and does not attempt to discriminate as to the respective merits of the works which it selects for exhibition. On the other hand, it sets an example of generosity which I fear we must acknowledge we have not the means at our disposal to emulate. Every exhibitor, both last year and this, receives a handsome and artistic plaquette in silvered bronze specially designed and executed for each exhibition, and engraved with his name. It is an oblong plaque with design in low relief, and, as a memento and honourable record, is all that could be desired; at the same time it must be mentioned that the cost to the donors amounts to considerably over 120*l*.

Before leaving the details of the organization of the exhibition, I must briefly refer to one more which is distinctly opposed to the ideas prevalent amongst ourselves regarding the principles which should govern an exhibition devoted to art alone. It is, that, in concession to ideas still prominent with our neighbours, it is thought necessary to give information in the catalogue concerning the methods by which prints exhibited are produced. Thus, it appears to be imperative that it should be stated that the process is carbon, platinum, silver, an enlargement, or what not. It might be of use perhaps to give the names of the dealers where brushes, developers, and the like might be procured, and we also, not long ago, were bitten with the same mania. But we may remember that we have now passed the stage when at meetings of the Camera Club or of similar societies it was usual to solemnly present to the members the latest thing in cameras or shutters, the latest developer or washing trough or tripod. Such a system still prevails at the Photo Club of Paris, and is duly recorded in its journal as of great importance. And yet we are told that the highest art conceals the methods; and undoubtedly they should not stare us in the face. There are still those who pride themselves on the neatnesss of their developing rooms, and, if they are not the most efficient in results, they are perhaps the most fervent, and we may look kindly upon them while the fever lasts.

It would occupy too much space in these columns were I to attempt to analyse the *comptes rendus* and criticisms of the exhibition given in the various newspapers of the capital, interesting and instructive though they might be. Nearly every journal, artistic or social, noticed it at length, and I think our own countrymen have reason to feel gratified at the numerous and flattering mentions which they received. The *Figaro* and the *Gil Blas* allude by name to nearly all the members of the Camera Club who sent their work. Another journal speaks of H. P. Robinson's *Storm Clearing Off* as a *haute expression de l'art;* of Craig Annan's pictures as *de toute beauté;* of Davison's *Coup de Vent* in the highest praise. The *Journal des Artistes*, in a very long article, compares photography of to-day to Whistler rather than to Friant. Another paper devoted to art combats the notion that photography is art, but, this reserve being made, admits that some (such as Annan's *Cattle* and *Venice*, and Davison's landscapes) have arrived at a *véritable trompe-l'œil*. On the other hand, in noticing the very foggy effect of a picture by Harold Baker, which caused considerable diversity of opinion at our last Salon, some critics are unsparing in their denunciations and contempt; others, on the contrary, are as unstinting in unqualified praise of the same work, and in the words of one, "*il faut faire effort pour penser que la machine a collaboré*" to produce such a work of art. Finally, *L'Art Français* expresses itself in terms with which, speaking generally, I find myself in sympathy, to the effect that "photography can claim the attribute of art on condition that it transforms itself some-

* Concluded from page 342.

times into the character of a wash drawing, sometimes to that of a drawing in charcoal or aquafortis or the like, and loses this attribute as soon as it becomes a simple and mechanical representation of objects. How they do it, how they bring it to feeling and taste is their secret." But this is what hasty people call imitation of other arts.

It would be easy to show, by numerous extracts from criticisms, that the revulsion of feeling which leads photographers towards what (I know that I am using an inadequate expression) I must condense in the term impressionism has gained considerable ground in France. It is to works of that character that the greatest attention and the largest amount of admiration were directed. Mechanism, however skilful, adroit, and careful, has lost ground; the credit due to the machine is passed over as too common and too easy an accomplishment in the mastery necessary to exercise it. It is evident that the quality to be desired is the faculty of forcing the machine to obey the wishes of its master, and to become a tool to be used with a freedom equivalent to that of the pencil or brush of other graphic methods.

I have been obliged to regret that I had no opportunity of inspecting the exhibition as a whole, but I cannot help expressing my satisfaction at finding that the simplest processes, such as those of direct pigment printing by the method reintroduced by MM. Rouillé-Ladevèze and Artigue, are making great way amongst our neighbours. Very notable is the work of M. Démachy, who, by the use of direct coating in pigment, has achieved a success which surprised me. His portraits, charming in themselves, are rendered still more so by the use which he has made of the freedom placed at his disposal by the simple method for which we owe much to M. Ladevèze, that in which a preparation of bichromated gum and pigment is applied to the paper and developed from the front. *En passant*, I may be allowed to remark once more, as I have already done in my paper read at last year's Salon, upon the unwillingness amongst our experts to admit even the possibility of this method. Our text-books still persist in their misstatements on the point. In noticing with high praise M. Démachy's portraits, one critic observes that they resemble a crayon drawing by Chaplin. Imitation again! Truly it is unfortunate that photography should find everything patented before it.

The May number of the *Bulletin du Photo Club* contains a further critical article of considerable length upon the exhibition. M. Dillaye holds that there is evidence of the formation of distinct and national schools in pictorial photography, and so far is he impressed with this idea that, in the case of our own country, he does not hesitate to discriminate between what he calls the Scotch school and the English school. Whether there is any reason to suppose that we have advanced so far as to claim the distinction of any schools whatever is open to doubt, but that such differences exist as to warrant the classification of the English and Scotch apart is certainly carrying the idea to the borders of the ridiculous. English pictorial art in photography is characterised, it would appear, by a *tonalité grise*. So far as it goes, one cannot, perhaps, find fault with a general criticism of this kind, but one is inclined to think that it is based by M. Dillaye rather upon an idea of what he is expected to say upon the question of anything English than upon the evidence which he could produce to support it in the works exhibited. At any rate, it is too sweeping and too general. Of course we find trotted out the time-honoured exaggerations and misconceptions concerning the mists and fogs of our country so dear to the traveller whose ideas of England are limited to the neighbourhood of Leicester-square. No patriotic Frenchman would wish to be convinced to the contrary. Somewhat gratuitously also, M. Dillaye quarrels with the narrow feeling of our artists who confine their types, figures, costumes, landscapes, and skies to the very local, very particular character proper to the insular soil of Great Britain. What would he have? Clearly this is not, at any rate, the fault of our art. That, as he says, the *flouistes* are more numerous than the pre-Raphaelites is an appreciation which, whether exact or not, probably shows at least which way the wind blows, and I have no wish to dispute his conclusion that the English school is the most complete and the most solidly constituted (*la mieux affirmée*) amongst those who have raised the standard of photographic art. After a somewhat unkind remark that for an Englishman nothing which is not English has any chance of salvation, M. Dillaye examines at some length the *Storm Clearing Off* of H. P. Robinson—*le grand maître*, as he terms him. In it he sees a contradiction of Nature, in spite of the cleverness employed to conceal it. The sky lowers itself into the second planes of the picture to a degree which suggests smoke rather than a natural atmosphere, and the lighting of the sky is at least equal to an angle of forty-five degrees, while that which lights the sheep is a much more acute one. Noticing the Rev. F. C. Lambert's *Fog on the River after Sunset*, M. Dillaye comes to a conclusion that it is nothing more than the effect of a spoilt negative, a genesis which, in fact, he attributes to more than one picture of the unphotographic kind which so displeases him. With regard to Davison he refuses to admit his fuzzinesses (*floueries*), and remarks that he neither knows nor desires to know whether people in England go into ecstasies over these things, but he would wager without fear of losing that never in France will his countrymen go into ecstasies over them. *Non, jamais en France, jamais l'Anglais ne régnera*, as has been sung before.

With regard to the Austrian school, M. Dillaye finds that the portrait is the predominant type; very correct, but somewhat monotonous. He mistakes, however, the nationality of Mr. Bergheim, who, although at present a resident in Vienna, is, nevertheless, an Englishman.

The French school, to accept for the moment Mr. Dillaye's term, is, of course, treated at length, and our critic firmly believes that it exists, and is very marked and typical. Life and colour—these are its two characteristics. I cannot say that my own observation would lead me to suppose that, at present at least, it possesses any formed or definite features, beyond an indication that it is beginning to free itself from the fascinations of the snap-shot and enlargement thereof, and that, where any individuality exists, it runs in the direction which is so abhorrent to M. Dillaye. There are certainly a few exceptions from the dull level of monotony; in the work, for instance, of MM. Démachy, Le Bègue, Puyo, and Ladevèze, men who, I believe, are experts with the brush as well as with the camera. It would be instructive to know how far such a double talent is prevalent in France amongst photographers. Monsieur Dillaye's appreciation of the characteristics of the French school of photographic Art is no doubt correctly put when he says that it exacts in its work the feeling only which he would call *plastic*, without troubling itself much about *æsthetic* feeling. So long as it continues to do so, or a section of it may continue to do so, it will, of course, essentially differ from the productions of the new movement in England.

ALFRED MASKELL.

A NOTE ON COLOUR-SENSITIVE PLATES AND SCREENS.

[Photographic Club.]

AT the present time, when so much has been written upon colour and photography, it is extremely difficult to say anything new or anything practical, and I have no doubt that I shall traverse ground that is fairly well known to you all.

Colour is due solely to the suppression of light, and all coloured objects have the power of suppressing certain of the constituent rays which when combined form white light. This is extremely easy of demonstration, and if we project a beam of parallel white light we can, by the introduction of a specially constructed prism, split up or analyse it into its ingredients. The only special feature about this prism is that it is what is called a direct-vision prism, being actually composed of five small prisms cemented together, so that the refraction, but not the dispersion, of the light is obviated, because, of course, you all know that a prism refracts as well as disperses the light, and to get over the nuisance of having to slew the lantern round at an angle to the screen we use a compound prism.

Lest some objection be taken to this spectrum as not being that of solar light, I may at once state that the difference between this and the solar spectrum is that this is a continuous spectrum, whereas the solar spectrum is crossed by numerous dark lines, the Frauenhofer lines, and also that the spectrum from limelight is somewhat poorer in ultra-violet or the invisible rays beyond the violet than sunlight; but, notwithstanding the great stress laid upon the ultra-violet rays in photography, they are considerably over-estimated. The peculiar dark transverse lines in the solar spectrum are extremely valuable, as they enable us to speak definitely of a particular colour, such as the yellow at D, for these lines are distinguished by the principal letters of the alphabet, and A is at the extreme end of the red; in fact, it is very frequently more often imagined than seen in small instruments. Then we have big B in the red, C in the orange, D in the yellow, E in the yellowish green, little *b* in the middle of the green, F in the blue, G in the indigo, and H in the violet, the extreme limit.

I will show you presently a negative of the solar spectrum with some of the Frauenhofer lines distinctly visible.

I have already said that one advantage of these dark lines is that we can immediately name any colour; thus, by using a screen with a fine

slit close to the emergent face of the prism, it can be shown practically that, when we talk of yellow on the D line, then we have a colour such as you see on the screen now, or, if we talk of the green at E ½ F, we get a colour as you see now, and there is no question when dealing with the spectrum as to what is the exact colour which is meant. But how difficult it is to name the colours of any object in the ordinary way, as, for instance, we can say that we have a red or a green tablecloth, but that conveys about as much information to an utter stranger who has never seen the particular cloth in question as to compare anything in size to a lump of chalk.

Now, before getting off the subject of the spectrum, I will endeavour to show you that my earlier statement that all coloured objects have the power of suppressing some of the constituent rays is perfectly true.

If we take a piece of coloured glass, which is a fine green, and place it in front of our slit, we see that it has suppressed, absorbed, or cut out certain colours, and the sum of the remainder is green. Precisely the same occurs with euery other substance, whether transparent or opaque, the only difference being that, in the one case, the light is transmitted and in the other reflected.

We now come to the question of the reproduction of these colours by photography. You will at once admit that to our eyes the yellow or yellowish green is the most brilliant colour; but, to the photographic plate—the ordinary plate—yellow appears black, and bright blue the brightest, and the whole value of the colour-sensitising plate is in making the silver salt sensitive to yellow, green, and red. This, as you know, is done by the incorporation of certain dyes with the emulsion when making the same, or by bathing the prepared plate. I will now show you some spectra photographed on ordinary plates on which to make them more distinct. I have ruled the positions of the principal Frauenhofer lines, and you will see that the sensitiveness of the plate falls off in a very striking manner in the green, is practically nothing in the yellow and in the red. Well, as we have seen, coloured objects reflect spectrum rays, and therefore the reproduction of a yellow or red flower, or the green of leaves, of grass, &c., by the photographic plate as too dark, is perfectly easy to understand.

Now, whilst we can sensitise our plate to some extent for green, yellow or red, still the inherent sensitiveness of the plate is so great to the blue that we use coloured screens or light-filters to cut down the blue, or absorb it to such an extent that the ratio between the deposit in the blue is to that in the yellow more equal to their relative visual brightness.

These screens may be either coloured glass or cells filled with solutions of dyes, or even glass coated with stained collodion. The collodion and the glass are, for practical work, far more convenient, though, of course theoretically, the cells with liquids are the best, because you can dilute the solution to any extent, or make it stronger by adding a drop or two of concentrated solution.

I have carefully examined all the commercial screens on the market and, whilst they fulfil their purpose practically, I venture to think they could be improved in one or two minor points. Taking all the commercial yellow screens, if they are not made by the same glass-maker, they are all made on practically the same lines. They have the same colour composition, which is, I think, an erroneous one.

Taking as an example the palest screen used, the composition of this is—

Black.		Orange.		Yellow.
·1	+	2·	+	5·9.

The colour composition of the darker is—

Black.		Orange.		Yellow.
·2	+	2·8	+	9·0.

Of Burchett's screen, green 7+5 yellow.

Now, the presence of black is doubtless unavoidable from the particular method of manufacture, but it is unfortunate, because it must simply mean a loss of light and an increase of exposure, which should not be required. The presence of orange, of course, dulls the green slightly. I propose to show you later on the action of these screens on the visible spectrum, but now will merely pass one or two slides, or rather negatives, through to show their action when used in front of the slit of the spectroscope.

As possibly my method of working may be of interest to some one, and give an idea of the simplest way to set about it, I will show you the whole apparatus. The spectroscope is a small direct-vision one by Browning, of the Strand, to which is attached a scale. This, however, is only useful for visual work, as in photographing it becomes more of a nuisance than use, and really, having once or twice determined the position of the lines, one recognises them instantly in the negative. The eyepiece of the spectroscope is removed, and it is attached to a Taylor, Taylor, & Hobson's flange, so that it can be used on my ordinary camera front, though for convenience I use a stereoscopic camera, 6½ × 4¼, and two quarter-plates, or the double quarter-plate can be used, and four or five comparison spectra obtained on one plate. The size of the spectra—that is, the length and width—is entirely dependent on the distance of the plate from the prisms. But there is another very important item to take into account, and that is the purity of the spectrum. This, however, I shall refer to later on; but, of course, the presence of the Frauenhofer lines is also dependent on the width of the slit, because if you widen out the slit the lines disappear altogether, and you get merely the broad band of colours; but, as the Frauenhofer lines are convenient mile-stones, we want some of the principal ones to show, and therefore we use as wide a slit as will give us these somewhere, and also it must be remembered that the wider the slit the shorter the exposure.

We have had lately some extremely interesting papers on the reproduction of colours in monochrome by photography, and if I refer to some of the statements made, which I think are erroneous, I hope I shall not be travelling beyond the title of my paper.

In the first place I take very strong exception to any colour chart, either printed or painted, being hawked round as the test for colour sensitiveness. As a practical proof of how far that particular chart can be more or less correctly rendered by a particular plate, I admit it; beyond that I say it is unfair to go. You cannot practically lay down any chart of colours on white paper by means of litho or printer's ink without white light being reflected from its surface, and, as I will endeavour to show you with our spectrum, you have merely to mix sufficient white light with your colour to get no colour at all.

It has been stated, and at the Camera Club too, that we did not get a spectrum hanging on every tree or on every coloured object, a statement which is perfectly true, but equally as misleading as telling a man that to get to Brighton from London he would have to travel right round the world by land and sea till he came to Brighton. What I contend is that, if you know the spectral sensitiveness of your plate, you merely have then to determine the colour composition of any colour by the Clerk Maxwell, Abney, or any other method, and you can at once say how your plate will reproduce it.

I have referred to commercial colour screens, and, after giving these and their manufacturers a back-handed slap, you may well ask, Have I anything else to place before you which is an improvement? I am glad to say that I can answer in the affirmative; and, further than that, I could guarantee that all the screens should be absolutely of the same depth of colour, whether bought now or two or three years hence. I will show you the screen and compare it with the commercial screens, and you will at once see the difference, both visually and on the spectrum.

Gentlemen, I might have treated the subject far more fully, only that I was afraid of boring you and of really going into matters which are just a little germane to my title. Captain Abney has lately stated that isochromatic plates gave practically in the middle of the day in the middle of summer no superior results to ordinary plates as regards colour rendering, a statement which has to a great extent been an accepted axiom, even by the makers of iso plates, for some time, and this is so because there is then so much white light mixed with the colours. On the other hand, this is just when a yellow screen should be used, and you will at once get a different rendering; but as the sun sinks lower, and the light gets yellower, the colour sensitive plate proves its superiority, as it does also in the early spring and autumn, and under such circumstances one must be careful not to over-correct by using too deep a screen; because, take a landscape illuminated by a low sun, the light is distinctly yellow wherever the sun falls, but the shadows are illuminated by blue light, which is reflected from the sky. To us a screen under such circumstances would mean simply that you would intensify your shadows, and therefore get a negative with far too much bare glass or too full of contrast.

For copying pictures and coloured objects sunlight is best, but next to this magnesium. Where you have much red and orange, then a deep screen of such a depth as to practically cut out the whole of the blue should be used, and by giving a long exposure with this, your plate being sensitised, of course, for colours, and then giving a brief exposure without a screen, or with a very pale tint, so as to give the blues a chance to act, you will be able to get a faithful rendering of the subject.

E. J. Wall.

THE EQUIVALENCE OF THE ALKALIES.

It will have been observed by those who have read the article on this subject in the issue of May 24 that the writer of the article

makes no attempt to correct or to justify the accuracy of the table which he published in the issue of May 3, and which, he points out, is identical, except as regards a single point, with a table published in the ALMANAC for 1885. I judge that he has recalculated the figures, and has arrived at the same results as before. It would perhaps have been more convincing had he handed over the table to some chemical friend for confirmation, since in monotonous calculations of this kind it is extremely easy to repeat the same errors. The writer of the article, however, sees no necessity to alter any of the figures, and it is therefore my unwelcome duty to lay before my readers an outline of the calculation by which the figures in my own table were obtained. In most cases the figures in the two tables bear a very simple numerical ratio to each other, many of those in that in the issue of May 3 being half or double the correct values. I must first point out with some distinctness the meaning which the writer of the article attaches to the figures in his table. On page 277 he says: "The figures fairly represent the comparative combining values of the different alkalies; that is to say, they show in a concise form the relative quantities of each required to neutralise a given quantity of, say, sulphuric acid; but that they necessarily represent the relative developing values of the separate substances is far from being as readily conceded." These words are explicit, and do not seem to admit of any other interpretation. The table is a table showing the relative *acid-neutralising* values of the various alkalies; it is not intended to show the relative *developing* values of the various alkalies. I must really keep the writer of the article to his definition as here stated, because he subsequently seems inclined to depart from it, and to regard the figures as expressing the relative developing values, and not the relative acid-neutralising values (*vide* page 327, line 49, and page 328, line 35).

The writer points out—and, possibly, some people will be inclined to agree with him—that, in comparing the developing powers of the caustic alkalies, the alkalimetric value of each alkali affords a fairly safe basis of calculation on which to substitute one for the other; that the same remark is true for alkaline carbonates among themselves, but that the alkalimetric value is no guide when substituting caustic for carbonated alkalies. But with the writer's statement, that the various alkalimetric values of the alkalies are represented by the numerical table which he gives, no one, I feel sure, will agree. Taking the most liberal view possible, there are, out of the total of sixty-four values given, at least thirty-five which are absolutely incorrect. Let us see the proof of this somewhat sweeping assertion. The writer says that the figures represent the relative quantities of each alkali required to neutralise a given weight of, say, sulphuric acid. Let us adopt this specification as a test of the correctness or otherwise of the table, and let us calculate the relative quantities of each alkali required to neutralise, say, ninety-eight parts by weight of sulphuric acid, a quantity which is represented by the formula H_2SO_4.

The weights needed in each case should, if the writer's calculations be correct, stand in the ratio of

$$1 : 1{\cdot}400 : {\cdot}425 : 2{\cdot}650 : 7{\cdot}150 : 3{\cdot}450 : 4{\cdot}350 : 2{\cdot}115.$$

When ninety-eight parts of sulphuric acid are neutralised by caustic soda, the proportions of reacting substances are represented by the equation—

$$\underset{98}{H_2SO_4} + \underset{80}{2NaHO} = Na_2SO_4 + 2H_2O.$$

Hence the quantity of caustic soda required is 80 parts. Similarly 112 parts of caustic potash are required to neutralise the same weight of sulphuric acid. When ninety-eight parts of sulphuric acid are neutralised by carbonate of soda, the proportions of each substance entering into the reaction are represented in the equation—

$$\underset{98}{H_2SO_4} + \underset{106}{Na_2CO_3} = Na_2SO_4 + H_2O + CO_2.$$

Hence 106 parts of anhydrous sodium carbonate are required.

A precisely similar method of calculation shows that 34 parts of ammonia gas, 286 parts of crystallised carbonate of soda, 138 parts of anhydrous carbonate of potash, or 174 of crystallised carbonate of potash, are necessary to neutralise 98 parts of sulphuric acid.

I now come to sesquicarbonate of ammonia, in regard to which Mr. Bolton states that my table is incorrect. I am free to admit that my figures are based on the formula of the anhydrous carbonate, and that it would have been nearer the truth to have included the two molecules of water of crystallisation. I may add, however, that chemical literature is not unanimous on this point.

Now, when sulphuric acid is neutralised with sequicarbonate of ammonia, what takes place? Surely the action is represented by this equation—

$$\underset{290}{(NH_4)_2CO_3{\cdot}2(NH_4HCO_3){\cdot}2H_2O} + \underset{196}{2H_2SO_4} = 2(NH_4)_2SO_4 + 3CO_2 + 5H_2O$$

In other words, 196 parts of sulphuric acid require for neutralisation 290 or 98 parts, 145 parts of hydrated sesquicarbonate. Employing the formula of the anhydrous carbonate, eighteen units must be subtracted, leaving a number 127, representing the weight of anhydrous carbonate which just neutralises 98 parts of sulphuric acid. The alkalimetric equivalent of anhydrous sesqui-carbonate is half this last number, or 63·5. The method adopted by the writer of the article of arriving at the chemical equivalent of a a carbonate, viz., by dividing the molecular weight of the carbonate by the mumber of molecules of carbon dioxide displaced, may, by some happy chance, give the chemical equivalent of some bodies. In most cases, however, it does not. It fully explains all the errors made by Mr. Bolton in the compilation of the table.

We have now obtained the parts by weight of the various alkalies required to neutralise ninety-eight parts of sulphuric acid. It will be seen that the numbers we have obtained, viz., 80, 112, 34, 106, 286, 138, 174, and 127, stand to one another in the ratio—

$$1 : 1{\cdot}400 : {\cdot}425 : 1{\cdot}325 : 3{\cdot}575 : 1{\cdot}725 : 2{\cdot}174 : 1{\cdot}587.$$

Turning to Mr. Bolton's table, it will be noticed that figures expressing carbonates in terms of caustics are exactly double the right value, while, conversely, those expressing caustics in terms of carbonates are exactly half the right value. The figures for sesquicarbonate of ammonia are also uniformly in error.

I think I may now claim to have shown that the table on page 277 does not express the relative quantities of alkali required to neutralise a given weight of any acid, and, although Mr. Bolton has stated in most specific terms, in the passage I have quoted, that such is the meaning which he attaches to the figures, yet, when reading the conclusion of his second article, I am almost persuaded that he is inclined to let that specific definition go for nothing, and to maintain that these numbers do not represent neutralising values at all; that they stand for the relative weights of the various alkalies which communicate to a solution of pyrogallol or hydroquinone the same degree of developing power. That such is the light in which Mr. Bolton latterly regards the numbers is surely the only inference to be drawn from his reference to Mr. Stillman's letter in the issue of May 3.

But what is the real function of the alkali in development, and who can measure the intensity of its action? It is true that many developers contain, as preservatives of the essential developing agent, considerable quantities of acid or of such acid salts as potassium metabisulphite. When the alkali is added to the developer, it first neutralises this free acid; it does so according to fixed and invariable stoechimetric laws; but, when all the acid has been neutralised and free alkali is present in the developer, the case is entirely different. The energy of the alkali is no longer to be measured by its alkalimetric equivalent except in the case of the same alkalies differently hydrated. Caustic potash, for example, is in many chemical reactions a far more energetic substance than an equivalent or even an equal weight of caustic soda, although the acid-neutralising power of the soda is much greater than that of the potash. As Mr. Bolton says, in alkaline development we are not concerned with the neutralisation of acid, we are concerned with the impetus which is communicated to the pyrogallol by the chemical energy of the molecule of the alkali.

It is impossible to compare the developing powers of caustic and carbonated alkalies on the basis of their respective combining weights; in fact, it is impossible to compare the developing powers of the different caustic alkalies on the same data. The figures advanced by Mr. Stillman do not depend on alkalimetric equivalents. They are the result of practical experiments in development and the comparison of negatives, and possess a practical interest. But what can we say of Mr. Bolton's figures? I have shown that they are not relative alkalimetric values, for they are based on incorrect equivalents. If they are intended to represent the relative weights, communicating the same energy to a developer, then let me ask the question, Upon what data do they rest? That they involve some hazy notion of equivalence is evident, but their compiler must be aware that the equivalence of combination and the equivalence of chemical energy are two distinct conceptions, and that there is not, so far as we know, a simple relation between the two.

The equivalents of the various alkalies in development are only to be ascertained by empirical practical experiments. There are, however, many instances, such as the preparation of solutions of

salts, &c., in which a knowledge of the alkalimetric equivalents of the alkalies is of great value to the photographer. For that reason I have pointed out that Mr. Bolton's table is very far removed from the truth.

Concerning the utility of the tables for expressing the relative developing powers of the alkalies, I might say to Mr. Bolton,—

"I think not much of yours or of mine,"

but I *do* maintain that the table which followed the publication of Mr. Bolton's *does* represent the alkalimetric equivalents of the alkalies, and that his table does not do so.

G. E. Brown, A.I.C.

COLLODIO-CHLORIDE PAPER.

[Amateur Photographic Association of Victoria.]

A year or two ago I received a sample of collodio-chloride paper from a German manufacturing house, in order to test it and to ascertain its keeping qualities, and whether it was capable of enduring a sea voyage through the tropics. Three different kinds of paper were included in the sample, each being carefully marked to distinguish it from the other.

Upon opening the packages the sensitive paper was found to be enclosed, first in a soft paper wrapper, then in thick waxed paper over which was a non-actinic paper, the whole being covered with brown paper.

All the sensitive paper was more or less discoloured, most of the sheets so badly so that they were unfit for use; however, a few of the best from two of the packets were selected and tried, and, at a meeting held some time after, some of the members were supplied by me with samples of the material.

Only one of these two samples was workable, and even it was not in first-class condition; the contents of the third packet were valueless.

The sheets tested by myself were placed in printing frames in contact with selected negatives and printed to the depth usual with gelatino-chloride emulsion papers. They were then soaked in a mixture of methylated spirit, 1 ounce, water, 2 ounces to soften the film which after desiccation had become exceedingly horny; this was perhaps hardly to be wondered at, considering that the paper had been made for three months or more and had experienced very warm and dry weather.

After a few minutes' soaking in the dilute alcohol the prints were transferred to a dish of water face downwards, care being taken not to have a greater depth of water than about three quarters of an inch, and to press the prints well down on to the bottom of the dish in order to keep them flat, as they show in the early stages of washing a strong tendency to curl up somewhat similarly to a roll of Eastman film.

Having been treated to five or six changes of water, they were placed in the ordinary acetate toning bath (acetate of soda 30 grains, chloride of gold 1 grain, water 8 ounces, made up twenty-four hours before use), the toning was slow and the film showed an inclination to leave the paper at the edges; after toning, the prints were subjected to a couple of changes of water and then introduced into the fixing bath, which consisted of hyposulphite of soda 3½ ounces, water 20 ounces, which had been made up two or three hours previously in order to allow the temperature to rise to about the normal point; fixing was allowed to proceed for twenty minutes, during which time the prints were constantly turned over and kept moving.

The operation of fixing developed some of the eccentricities of the paper; sample No. 2 exhibited very few signs of a divorce between paper and film beyond the before-mentioned fraying at the edges, but sample No. 3 behaved in such a manner as to completely shame even a good blistering piece of albumenised paper, for patches of the film as large as half-a-crown left the paper, and, by the time the final washing had been completed, one or two of the prints from this sample were quite separated from the paper, which was perfectly blank, while the films were floating about in the dish.

Sample No. 2 stood the ordeal better, and, after a somewhat extensive cutting down so as to get rid of the damaged edges, was fit for mounting; the tone was satisfactory, and the gradation and detail good, the only drawback being the appearance of slight cracks after drying, the film having left the paper in places.

I carefully noted the behaviour of these papers, as I had been asked by the manufacturers to subject them to as severe a test as I thought fit, for they wished to ascertain how the papers withstood treatment after so long a time.

Some time after my reply to the makers had been forwarded, I received another communication from them; in this they mentioned that the results which I had obtained were almost what they had expected, and with their letter was forwarded another sample, which had been so prepared as to eliminate the objectionable feature of discolouration, cracking and slipping of the film.

This new sample arrived in almost perfect condition and worked much better than the old, but it possessed the same horny characteristic, which was not thoroughly absent from it even after toning, fixing, and drying.

Through the courtesy of the Editor of the *Australian Photographic Journal* I received a few months ago a sample of American collodio-chloride paper which equalled the best German in every respect.

I think this is all I can say about the paper; if it can be produced more cheaply and is used fresh, say within two or three weeks of coating, I think it will be a valuable article, especially in the summer months and the warmer parts of Australia, for in some of these places the use of the gelatine papers has been attended with so much difficulty and risk that many are abandoning them and returning to the use of albumen.

Price also will have a great effect on their popularity; the lowest price quoted by the German manufacturers were in excess of the ruling prices for gelatine papers, and this is an important consideration.

If the price is lowered and the paper is supplied new, I am of opinion that many will gladly use it in place of albumenised and gelatine papers.

The solutions recommended by the makers are practically the same as for gelatine-chloride papers, they advise sulphocyanide toning baths or any of the standard baths where separate toning and fixing is used, and, where combined toning and fixing is preferred, they say that any of the ordinary formulæ are suitable; I, however, for various reasons, prefer the separate acetate of soda bath for toning, and fix the prints afterwards, and I was perfectly satisfied with the results.

I must, before closing, call attention to a peculiar fact, and that is, that these prints which I am now treating were made some months ago, and have been since that time stowed away in a portfolio between some untoned prints on gelatino-chloride paper; it will be noticed that they are comparatively fresh-looking—not much discoloured.

Three pieces of the same paper which had been left in contact in the original packet (though two of them were placed face to face) appeared on examination as red as dark mahogany.

It would appear that the gelatine paper has actually exercised a preservative influence on the collodion emulsion greater than the latter has on itself; this circumstance is curious and is worthy of consideration, for we may have here some help towards a solution of the difficulty of the preservation of the paper.

J. H. Harvey.

PRIZE FOR PHOTOGRAVURE.

[Society of Arts.]

Report of the Committee.

The Committee are glad to be able to report a successful result of the offer by the Society of prizes for the best photogravure plates and negatives. The following were the prizes offered:—

(1). A prize of twenty pounds (with a silver medal) or a gold medal for the best reproduction of a selected picture by a photogravure process.

(2). A prize of ten pounds and a silver medal for the best photographic negative of a selected picture, suitable for reproduction by a photogravure process.

Competitors were required to send in a reproduction of Mulready's picture, *Choosing the Wedding Gown*, now in the South Kensington Museum, this picture having been selected on account of the difficulties it presents to reproduction by purely photographic and mechanical means. It contains a great variety of colours with strong contrasts, and many of the tints are precisely those of which it is more difficult to render the values in light and shade by photography.

The Committee demanded, for prize No. 1 a plate produced without any hand work at all, and for prize No. 2 an untouched negative. They quite recognised the fact that the best results have hitherto not been produced without hand work, but their object was to ascertain how far a satisfactory reproduction of an artist's work could be obtained without the intervention of another and different personality, and they think that their demand has been justified by the result.

There were in all nineteen competitors, of whom five entered only for prize No. 2.

The following Committee was nominated by the Council to draw up the conditions of the award, and to judge the works sent in:—Major-General Sir John Donnelly, K.C.B., Chairman of the Council; Sir Frederic Leighton, Bart., P.R.A., H. T. Wells, R.A., E. J. Poynter, R.A., Francis Cobb, Thomas Armstrong, Captain W. de W. Abney, C.B., F.R.S., and Sir Henry Trueman Wood, Secretary. Sir Frederic Leighton and Mr. Poynter were not able to take part in the adjudication.

The Committee were greatly impressed by the excellence of much of the work sent in, a great deal of which was quite up to a standard that might have justified the award of the prize. In judging of the relative merits of the pictures they laid especial stress on the truthful rendering of the colour values. and they consider that the selected competitors have been very successful in this difficult task.

The Committee recommend that the prize of a gold medal (or twenty pounds and a silver medal) be awarded to A. Ernest Smith, 5, Coldershaw-road, Ealing Dean, W.

They also consider the work sent in by A. S. Handford, 3, Coldershaw-road, Ealing Dean, W., is worthy of high commendation.

They recommend that the prize of a silver medal and ten pounds be awarded to The Swan Engraving Company, 116, Charing-cross-road, W.C., for the negative sent in by them.

The Committee consider that the Society is greatly indebted to the Science and Art department, which granted facilities for the copying of the picture, and also to the officials of the department upon whom, in

carrying out the necessary arrangements, a good deal of trouble was thrown.

The Committee think it desirable that the works sent in should be exhibited for a short time in the Society's house.

An Exhibition of the photogravure prints, plates and negatives, received in the above competition, will be held till Saturday, June 15, from ten to four o'clock. Admission by ticket, which may be obtained on application to Sir H. Trueman Wood, Secretary.

Our Editorial Table.

FALLOWFIELD'S *Photographic Remembrancer* for June has reached us. As usual, it includes details of all the most recent novelties in apparatus, to which it forms a capital guide.

THE "VENUS" PAPER.

Milne & Co., 1A, Ramsden-road, Balham, S.W.

THIS is a new matt surface printing-out paper. It is claimed to be prepared by a totally different process to any other now in the market, and, although the image is well on the surface as far as appearance is concerned, it is stated that it really goes very deeply into the paper, in fact very nearly through to the back. At present it is made on rough paper and a fine smooth surface, can be toned by any process to any desired colour, and may be placed in very hot water to eliminate hypo without any injury, dried between blotting-paper or by heat. We submitted both kinds of the "Venus" paper to practical trial, and were much pleased with its readiness to take good and agreeable tones in separate toning and fixing baths. The results upon it are highly effective, and, now that there is such a considerable call for rough-surface papers, we have no doubt that the new claimant for public favour will be highly appreciated.

A DICTIONARY OF PHOTOGRAPHY.

By E. J. WALL, F.R.P.S. London: Hazell, Watson, & Viney, Limited.

THIS is the sixth edition of a work which has deservedly proved popular, and we do not require the announcement in the preface to let us know that it is an improvement on the previous editions, in the sense of its having been largely rewritten and enlarged, for a glance through its pages (of which there are 630) shows that it has been brought quite up to date. A considerable amount of time and research must have been bestowed upon the work, which has been well and conscientiously written.

In addition to brief dissertations and various articles descriptive of chemicals and processes to be found under their particular headings, we have a variety of useful tabulated matter distributed throughout the book and condensed in an appendix, a consultation of which will prove highly instructive. A feature also of utility is a numerous collection of synonyms, in which nearly every term employed in photography has its counterpart in German and French terms arranged alphabetically.

When we contrast Mr. Wall's book with another of similar import but of American inception, which we had occasion to notice a few weeks since, we conclude that in the possession of both volumes we have both the past and the present of photography in their most pronounced forms. The present one has several drawings, in a large degree illustrative of the optics of the art. Why, oh, why, Mr. Wall, when finding space to treat so eloquently on hand cameras, have you left stereoscopic cameras and all appertaining to stereoscopic photography out in the cold? (Price 7*s.* 6*d.*, crown 8vo., cloth.)

FITCH'S FILMS.

E. H. Fitch & Co., Seldon House, Fulwood's-rents.

IT is no exaggeration to say that the handling of Messrs. Fitch's films is attended with no more difficulty than the manipulation of glass plates; they are so exceedingly flat that they obviate the employment of carriers, and are, indeed, best placed in the dark slide in the ordinary way. As for the technical qualities and properties of the sensitive layer, we have always found these above reproach. Recently a trial of Messrs. Fitch's extra-rapid films proved, by the comparative practical test of the camera, that a very high degree of sensitiveness has been attained, while in all other respects they render development a pleasure.

PHOTO-CERAMICS.

By W. ETHELBERT HENRY, C.E., and H. SNOWDEN WARD.

IN the prospect of a possible revival of the photo-ceramic art, a manual devoted to the process will prove acceptable. In this handbook the authors confine themselves mainly to the production of ceramics by what has long been known as the "dusting-on" method, and give detailed directions as to what they have found the best means for carrying it into effect. The other system, known as the substitution method, is also described by a cutting from Mr. Nelson K. Cherhill's article on the subject in a *Year-Book* of ten years since. But how is it that the substitution process is attributed to Mr. Watson, of Hull? We thought that every one had been aware that "it was first worked out by" M. Lafon de Camarsac; nor, in the hands of a capable man, can it be beset with the difficulties surmised by the authors, for we have seen ceramics turned out by the substitution process by Mr. A. L. Henderson in rapid succession, and of great technical excellence.

There are, however, many useful hints in this handbook. Price 1*s.*, and 1*s.* 6*d.* in cloth.

SENSITIVE FINGER COVERS.

MESSRS. MARION & Co., Soho-square, have had manufactured for them exceedingly thin rubber finger covers, which on account of their thinness they designate "sensitive," for the sensitiveness of the touch when worn on the fingers is not in any way impaired. The cut shows the manner of using them on the thumb and the two first



fingers. They may be had of all dealers throughout the country at 6*d.* a box, containing a set of three. After this, who would have fingers stained by chemicals?

CATALOGUES.

A NEW and somewhat imposing catalogue of 154 pages has been issued by W. Tylar, Aston, Birmingham. It contains a great number of the novelties for the introduction of which Mr. Tylar has justly acquired fame. It is embellished with photographs in stereoscopic, panoramic, duplicated and ordinary form. Post free, 4*d.*

A CATALOGUE of cameras, lenses, and chemical preparations is received from W. Hume, Edinburgh. Needless to say, his well-known Cantilever enlarging apparatus is given a prominent position in the collection.

FROM Airs & Co., Farringdon-road, W.C., we have received a sample and description of their Bessus Film-holder, of a new design suitable for rollable or cut films.

FUERST BROS., 17, Philpot-lane, E.C., have sent us a compendious price-list of the Lumière plates and preparations in which they deal.

MESSRS. MORGAN & KIDD, of Richmond, send us their trade catalogue for 1895–6. It gives prices and particulars of the firm's various bromide papers, dry plates, enlargements in many styles, carbon enlargements, collotype prints and half-tone blocks, ceramic enamels (the newest of the firm's specialities), frames, &c.

News and Notes.

THE Home Secretary has requested the following gentlemen to inquire into and report on the manufacture, filling, and use of gas cylinders:—Professor C. V. Boys, Professor H. B. Dixon, Dr. A. Dupré, the Rev. F. J. Smith, and Professor W. C. Unwin. Mr. Robert F. Reynard, of the Home Office, will act as secretary to these gentlemen.

Cassell's Saturday Journal paints the following glowing and fanciful picture of the retouching profession:—"The art of portraiture has several branches, and perhaps the least known, and consequently least understood, is the art of retouching effectively each negative. One of the best retouchers recently

assured a representative of this *Journal* that the work, though tedious, is certainly lucrative. 'The essentials,' says our informant, 'are few, but important. A man must must have a steady hand, good sight, a thorough and complete knowledge of anatomy, and artistic taste. Given these qualities, combined with perseverance, he will, other things being equal, succeed. There is good money to be made at this class of business. A clever retoucher can earn his pound a day very easily. It is possible for *a smart man to get through six to eight cabinet portraits in an hour*, for which he probably receives one shilling a piece. The work, however, is very trying to the sight, and no man ought to sit at it more than four or five hours daily; it entails a deal of patient labour. One can never be too competent. It took me four years to thoroughly master the business, and I have known some persons from five to six years attempting to learn it, and then give it up in despair. Like the poet, a retoucher must be born to his art. If he has really an aptitude for the work, keeps steady, and is persevering, he can, when he has overcome the initial difficulties, make a steady income ranging from 200*l.* to 500*l.* a year.'"

THE STEREO-KINETOSCOPE.—The description of the arrangement of Mr. Edison calls to my recollection some experiments in this direction made by myself in the year 1852. It then occurred to me that if the series of figures in the zoetrope, or wheel of life, were taken photographically and duplicated as in the stereoscope, and both series viewed simultaneously with each eye, that, instead of a mere flat moving diagram, we should obtain the effect of a solid figure in motion. Accordingly, two large circular millboard discs were mounted on spindles rotated in opposite directions by means of a crossed band of common clock chain running on spiked pulleys on the spindles. The next step was to take the photographs. This, being the early days of the collodion process, was a tedious operation, as from eight to ten seconds were required for each exposure. The camera used was a stereoscopic one, giving two pictures simultaneously. Ten pairs of negatives were taken, from which twenty prints were obtained. Ten of these were mounted at equal distances on each of the flat discs for the commencing half of the movement of the figure, and the corresponding ten of the receding one, so that there were twenty pictures on each disc, the first starting from zero, and the last again reverting to the first. In each of the intervals between the pictures a slit was cut for securing a momentary vision of each, and the whole was rotated with the pictures well lighted and facing a looking-glass. The subject selected was a little man with a head so bald that it was aptly compared to a bladder of lard; he was seated in a chair in sunlight. Before him was placed a garden vase to represent a mortar; a pestle was extemporised. At the end of this was nailed a lath about fifteen inches long, marked off in ten divisions. In the first position our sitter rested the end of this lath on the bottom of the mortar; a pair of stereoscopic pictures were then taken. Next, one-tenth was sawn off the end of the lath for another picture, and so on through the ten divisions. The finished prints were then carefully spaced and mounted on the two discs. On rotating these before the looking-glass, the effect was extremely grotesque. The whole of the little man's body, while frantically pounding in the mortar, was in a state of quivering and violent motion, and his bald shining head bobbing up and down gave the whole display such a ludicrous effect as invariably to elicit roars of laughter, and the astonished sitter remarked, "I never worked like that." Another set of stereoscopic pictures were produced on a larger scale. A hand saw was marked off in divisions, and side-view pictures on each, of a carpenter sawing a deal on a stool, were taken. This was intended for a public exhibition, but circumstances prevented the arrangement from being completed; and, after all, unless the pictures are very numerous, there is the usual tremulous motion common to all zoetropes, and the subject is scarcely one of much scientific interest. The converse of this is to take a portrait, while the sensitised plate is moved uniformly from a radius during the time of exposure. The result is a horrible smear, having no recognisable likeness; but, if a print from this picture—or, better still, any number of them—is mounted on a rotating disc of similar radius, and, while in rotation, viewed through a small aperture, the effect of the motion is to foreshorten the picture in the direction of the transit, and reproduce it in due proportion. —Mr. F. H. WENHAM in the *English Mechanic*.

COLOUR AND SOUND.—The address which Mr. Wallace Rimington delivered to a large audience in St. James's Hall, on Thursday night, and the experiments which he showed in illustration of the title of his address, *Colour Music, a New Art*, were interesting, fantastic, pretty. The experiments delighted the witnesses of them as much as if they had been a pack of children, and the lengthy explanation sandwiched between the experiments was listened to with a patience that was the more exemplary on account of the conditions of heat and space under which its audience heard it—for apparently Mr. Rimington had invited twice as many people as the Great Hall would hold, and two-thirds of them had accepted. He observed, apologetically, in the course of his address, that he had not expected quite so many. The basis of Mr. Rimington's "new art," the groundwork of his experiments, as we should prefer to call it, is as follows:—Light is produeed by the vibration many millions of times a second of waves of energy; so lower down the scale is radiant heat and electro-magnetism, and so is sound. All these waves, as Mr. Preece pointed out the other day, are subject to the same laws of reflection, refraction, and polarisation. Now, white light, as we know, is capable of being split up into what we call the spectrum band, that is to say, into lights varying from violet through blue and green and yellow and orange to red. Beyond these visible colours there are invisible rays—rays which, beyond the violet, may be detected by the photographic plate, and beyond the red, as the latest developments of spectroscopic science show, by the electric thermometer. Taking the spectrum band as the basis of all colour, there are two remarkable points of resemblance between it and the musical octave. Of the first we have spoken—of their common origin in wave vibrations. The other point of resemblance is that which Mr. Rimington sets forth, and which we repeat for what it is worth. If, he says, we measure the rate of vibration at the first visible point at the red end of the spectrum, we shall find it is approximately one-half of what it is at the extreme violet end. Now, in music this relationship is the same. If we take the first and last notes of an octave, the latter has nearly double the number of air vibrations, and the first note of the new octave has exactly double. This is the case also with the spectrum band so far as the one octave is concerned; the lowest red stands for the first note of the octave, and the highest—violet—for the twelfth, or last note. Further than this, the blue end of the spectrum shows a tendency to a return to red in the violet, and the red end of the spectrum shows a similar tendency to a reappearance of blue, in the fact that it passes from scarlet to carmine before it fades away. So that Sir John Herschell and others may have been right when they surmised that, if our eyes could see them, the colours of the visible spectrum would probably repeat themselves in successive octaves in the great invisible portions beyond the red and the violet. This, then, is what Mr. Rimington does. He divides the spectrum band into diatonic intervals or notes on the same plan as that of the musical scale. These divisions are unequal, because the rays of the spectrum are unequally refrangible, but the colour notes are, as nearly as can be calculated, separated by equal intervals of vibration. He has perfected a keyboard which is similar to the musical one, and which renders it possible to write colour compositions upon the same scale of notation. By this he was able, on Thursday evening, to translate, so to speak, musical scores into colour, and to make use of rhythmical works already in existence for the development of his experiments. The mechanical effects are simple of description. A large sheet, gracefully draped and so surrounded by other draperies as to present an oval surface hung from roof to floor of St. James's Hall. The colour organ, a combination of piano and electric-light magic lantern, was placed at a fitting distance from it, and cast a flood of coloured light upon the sheet when a note or a chord was struck. The Hall was darkened, and one of Chopin's preludes was played, while every colour of light that one may see in earth or sea or sky, or upon the music-hall stage during the progress of a serpentine dance, chased one another over the screen. The effect was original, it was delightful to the senses, and when the last chord ended with a blood-red glow which seemed to have come from a sunset in the Krakatoa volcano year, the spectators burst into an applause many times repeated.—*Daily Graphic*.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,084.—"Improvements in Apparatus for Holding and Displaying Photographs, Pictures, Advertisements, and the like." F. G. PIERPOINT.—*Dated June*, 1895.

No. 11,092.—"A Machine or Apparatus for Mounting Photographs and the like." C. HODDLE.—*Dated June*, 1895.

No. 11,098.—"Improvement in Photographic Cameras." F. OSTERMANN.—*Dated June*, 1895.

No. 11,160.—"Improvements connected with Optical or Magic Lanterns." A. WRENCH.—*Dated June*, 1895.

No. 11,194.—"Improvements in or connected with Photographic Apparatuses." Complete specification. G. FRANKE.—*Dated June*, 1895.

No. 11,197.—"Improvements in Photographic Shutters." S. D. MCKELLEN.—*Dated Jane*, 1895.

No. 11,302.—"Improvements in Photographic Cameras." J. ZION.—*Dated June*, 1895.

No. 10,474.—"Improved Apparatus for enabling Photographic Images to be Taken, Projected, or Viewed in Rapid Succession." B. ACRES.—*Dated June*, 1895.

No. 10,484. — "An Improved form of Photographic Camera." J. W. COLLINGS.—*Dated June*, 1895.

No. 10,492.— "Improvements in or connected with the Production of Photographs." H. W. SEARLE.—*Dated June*, 1895.

No. 10,657.—"Improvements in Compounds for use in Pyrotechny and Photography." J. PAIN.—*Dated June*, 1895.

No. 10,666.—"Improvements in the Manufacture of Stripping Films for Photographic Purposes." J. B. B. WELLINGTON.—*Dated June*, 1895.

No. 10,712.—"Improvements in Oxyhydrogen Multiple Jet Apparatus." Complete specification. H. BRIER and THE SCOTCH AND IRISH OXYGEN COMPANY, Limited.—*Dated June*, 1895.

No. 10,725.—"A Method of Developing and Fixing Photographic Negatives or Prints by means of Rollers, Cylinders, or Pads. J. W. COLLINGS.—*Dated June*, 1895.

No. 10,730.—"Improvements in Photometers." F. H. NALDER, C. W. S. CRAWLEY, A. SOAMES, and A. P. TROTTER.—*Dated June*, 1895.

No. 10,749.—"Improvements in and relating to Method of and Apparatus for the Production of Coloured Photographs." Communicated by M. Anderson. Complete specification. P. JENSEN.—*Dated June*, 1895.

No. 10,784.—"Improved Photographic Dishes for Development of Films and Papers." R. J. PARKER.—*Dated June*, 1895.

PATENTS COMPLETED.

AN IMPROVED PROCESS OF AND APPARATUS FOR PRODUCING AND LIQUEFYING ACETYLENE GAS.

(Communicated by Edward Nicoll Dickerson, 64 East Thirty-fourth-street, in the City, County, and State of New York, and Julius John Suckert, corner of Prospect and Hudson-streets, Ridgewood, Bergen County, State of New Jersey, both in the United States of America.)

No. 5730. HENRY HARRIS LAKE, 45, Southampton-buildings, London, W.C. *April* 20, 1895.

ACETYLENE gas, when produced by the decomposition of the carbides of the alkali and alkaline earth metals with water, has reduced the cost of its pro-

duction to such an extent as to render it commercially applicable to illuminating and other purposes.

When an alkali metal carbide is used, the following formula will explain the chemical reaction :—$Ka_2C_2 + H_2O = Ka_2O + C_2H_2$, and, in the case of alkaline earth metal carbides, $CaC_2 + H_2O = CaO + C_2H_2$.

In the former case potassium carbide decomposes one molecule of water, forming potassium oxide and acetylene, in the latter calcium carbide and one molecule of water forms calcium oxide and acetylene gas.

If an excess of water is present, the hydrates of the oxides of the various metals are formed.

The object of this invention is to produce the liquefaction of acetylene gas at ordinary temperatures by the pressure exerted when this gas is generated by the decomposition of the above-named carbides by bringing them in contact with water, or its vapour, or with compounds containing an easily separated water molecule, such as hydrates.

In the practical application of this process we prefer, for economical reasons, to use the calcium carbide for the generation of the acetylene gas under pressure, and have found that with condensing water at a temperature of 56° Fahr. the liquefaction of the gas takes place at about 485 pounds gauge pressure.

With condensing water at an average temperature of 68°, 610 pounds pressure are required for its liquefaction.

We further find that to ensure ready liquefaction and a pure liquefied gas, necessitates the separation of air, non-condensible gases and water from the acetylene gas prior to or during its liquefaction, all of which can be accomplished with the apparatus herein described.

It is also advantageous to render the liberation of the gas regular and continuous, and to provide proper means for drawing off the liquefied gas into suitable receivers for transportation.

By bringing a properly regulated and continuous stream of water in contact with the carbide, the acetylene is generated and passes from the generator in a continuous current, although it can also be generated in intermittent quantities with the apparatus shown.

[A drawing represents a diagrammatic representation of the apparatus, partly in section, showing the general connexion of the parts with each other.]

The claims include :—1. The process of generating and liquefying acetylene gas by the decomposition of an alkali metal or alkaline earth metal carbide with water, thereby generating acetylene gas, and then liquefying said gas at suitable temperatures under the pressure developed by the generated gas, substantially as described. 2. The process of generating acetylene gas by the decomposition of an alkali metal or alkaline earth metal carbide with water, thereby generating acetylene gas, and then drying the generated gas by contact with said carbide, substantially as described. 3. The process of generating and liquefying acetylene gas by the decomposition of an alkali metal or alkaline earth metal carbide with water, thereby generating acetylene gas, then drying the generated gas by contact with said carbide, and liquefying the same by means of the pressure developed by the generated gas, substantially as described. 4. The process of generating and liquefying acetylene gas from an alkali metal or alkaline earth metal carbide by contact with water, thereby producing acetylene gas, then drying and increasing the quantity of said gas by renewed contact with said carbide, and liquefying the combined gase, substantially as described. 5. The process of continuously generating and liquefying acetylene gas from an alkali metal or alkaline earth metal carbide, by bringing in continuous contact therewith predetermined quantities of water, thereby producing acetylene gas, liquefying said gas continuously, and removing the liquefying gas as necessary, substantially as described. 6. The process of generating and liquefying acetylene gas by the decomposition of an alkali metal or alkaline earth metal carbide with water, thereby producing acetylene gas, and then liquefying said gas, in part by the pressure produced by the combination of the water and the carbide, and in part by pressure applied to said gas by mechanical means, substantially as described. 7. The process of producing, liquefying, and subsequently utilising acetylene gas for commercial purposes by the decomposition of an alkaline metal or alkaline earth metal carbide with water, thereby producing acetylene gas, then drying the gas so produced by renewed contact with said carbide, then liquefying said gas and introducing the same into receptacles which can be separated from the liquefying apparatus and used for transportation purposes, substantially as described. 8. The process of continuously producing and liquefying acetylene gas, which consists in first producing the gas by the decomposition of an alkali metal or alkaline earth metal carbide with water, forcing the air from the apparatus by means of such acetylene, then increasing the pressure to the liquefying pressure under the conditions of the process, continuously removing the moisture from the generated gas into a suitable receptacle, then drying the gas by contact with a drying material, and finally liquefying the gas in an artificially cooled condenser, substantially as described. 9. The process of generating acetylene gas by the decomposition of an alkali metal or alkaline earth metal carbide with water, by bringing the same in contact in a suitable generating chamber; in drying, cooling, and liquefying the acetylene gas until the charge in the decomposing chamber is practically exhausted; in then exhausting said chamber by an exhaust and compression pump, which removes the remaining gas and forces the same into the cooling and liquefying system, which, during said operation, is separated from the generating chamber excepting through said compression pump, substantially as described.

Exchange Column.

Will exchange new mahogany camera, one double dark slide, all brass bound, with symmetrical lens, worth 20*l.*, for first-class bicycle with Dunlop pneumatic tyres, in good order, not under thirty pounds' weight.—Address, L. Scoffield, Sudbrook, Grantham.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
17	Leeds Photo. Society	
17	Liverpool Amateur	Exc.: Trefriw and Gwydir. Leader, Mr. Beer.
17	North Middlesex	*Intensification of Negatives.* J. McIntosh.
17	Richmond	
17	South London	Social Evening.
18	Birmingham Photo. Society	Excursion: Buildwas and Much Wenlock. Leader, W. Jones.
18	Brixton and Clapham	
18	Hackney	
18	Hastings and St. Leonards	
18	North London	
18	Paisley	
18	Rochester	
19	Bury	
19	Leytonstone	
19	Photographic Club	*The Safety of Gas Cylinders.*
19	Southport	
19	Southsea	
20	Glossop Dale	
20	Gospel Oak	Results of Competition.
20	Handsworth	*Skies* versus *Blanks.* H. C. Manton.
20	Hull	
20	London and Provincial	*Spirit Photographs: Should they command Belief?* P. Everitt.
20	Oldham	
20	Oxford Photo. Society	
21	Cardiff	
21	Croydon Microscopical	
21	Holborn	
21	Leamington	
21	Maidstone	
21	North Kent	
22	Croydon Camera Club	Excursion: Oxted for Broadham Green. Leader, The President.
22	Hull	
22	Liverpool Amateur	Exc.: Caergwrle. Leader, Dr. Ellis.
22	North Middlesex	Excursion: Guildford.
22	Oldham	Exc.: Miller's Dale. Leader, B. J. Holt.

ROYAL PHOTOGRAPHIC SOCIETY.

June 11,—Ordinary Meeting, held at 12, Hanover-square,—The President (Sir H. Trueman Wood, M.A.) in the chair.

The President congratulated the members on the acquisition of the new premises, which he thought much superior to the old ones, and trusted that increased prosperity awaited the Society.

The nomination papers of many new candidates for admission to the Society were read for the first time, and the ballot was taken for several others, all of whom were elected.

It was announced that the following members had been admitted Fellows of the Society :—Messrs. W. K. Burton, W. Taverner, C. B. Keene, and F. Marsh.

The Hon. Secretary stated that Mr. F. P. Cembrano, Mr. E. J. Wall, and Mr. W. England had been elected the Selecting Committee for the forthcoming Exhibition, and that the Hanging Committee was to consist of Mr. Cembrano, Mr. A. Mackie, and Mr. J. A. Hodges, the officers of the Society being *ex-officio* members of both committees.

The hours during which the Society's rooms will be open will, in future, be as follows :—Mondays, Tuesdays, Thursdays, Fridays, ten to four; Saturdays, ten to one; Wednesdays, ten to eight. On meeting nights the rooms will reopen at seven.

Orthochromatics.

Captain Abney read a paper on this subject, illustrated by numerous lantern slides, spectrum experiments with the electric light, &c. Addressing himself to the question of the reproduction of paintings, &c., he commenced by exhibiting a chart of four simple colours—red, yellow, green, and blue—and said it was essential for their purposes that the luminosities of those colours should be ascertained. He pointed out that their luminosities varied according to the light by which they were illuminated. It was therefore necessary to find the theoretical plate which was sensitive to the different luminosities, and not simply to the pure spectrum colours. Having shown slides illustrative of the luminosities of various colours, he incidentally remarked that the electric light was the most useful by which to work in these experiments, and then, by the aid of a projected spectrum, and red, green, and blue glasses, proceeded to illustrate the fact that, by the filtering action of those glasses, the spectrum was, as it were, split up into three distinct parts, and proceeded to lay down the proposition that the sum of their different sensitivenesses to light is equal to the whole when mixed, and consequently, if one knew the sensitiveness of a plate to the entire spectrum, its sensitiveness to different parts of the spectrum could also be determined. A plate could be tested for colour sensitiveness, without employing the spectrum at all, by using a row of small colour glasses—white, blue, green, yellow, red (although it was only really necessary to have red, green, and blue)—and exposing the plate behind them, it being previously necessary to measure the luminosities of the various colours. Thus a scale of densities would be obtained by which the colour sensitiveness of a plate could be measured. To reduce the luminosities of the various colours, he employed a rotating disc of irregular shape, which acted by cutting out. To obtain equal colour sensitiveness throughout the spectrum when photographing with a screen, he employed an aqueous solution of naphthol green in conjunction with an orange screen. Captain Abney concluded by remarking that his aim had been to provide the practical photographer with a method of ascertaining the colour sensitives

ness of his plates and a screen which, when once obtained, would answer for all purposes.

A brief discussion followed, most of the speakers expressing an anxiety to see the paper, which is to form one of a series, in print.

Mr. J. CADETT said that, while one might get by orthochromatic plates the true luminosity of a subject, one did not get colour contrast, which, he appeared to think, should be aimed at.

Mr. J. FUERST was of opinion that Captain Abney's paper would be of great value in disposing of the idea that ordinary plates were of any value for colour work.

Mr. W. E. DEBENHAM, in the course of a few remarks, hoped the paper would dissipate the notion that one must have different screens according to the subject to be photographed.

The PRESIDENT, in reference to Mr. Cadett's observation, said it was impossible to obtain the proper contrast of colour by means of photography, otherwise it would simply mean the reproduction of the colours themselves. He thought the practical value of the paper, which pointed out how to obtain the correct relative translations in monochrome, was very great.

Mr. Warnerke, Mr. Chapman Jones, Mr. Spiller, and Mr. Sebastian Davis having made remarks, Captain ABNEY replied to them, and was accorded a hearty vote of thanks.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 6,—Mr. G. W. Atkins in the chair.

STEREOSCOPIC PHOTOGRAPHY.

Mr. THOMAS BEDDING, F.R.P.S., gave an address on this subject. Having briefly explained just so much of the theory of binocular vision as was essential for the stereographer to comprehend, he pointed out that stereoscopy antedated the introduction of photography, two dissimilar drawings being made, which on being viewed binocularly gave the impression of solidity. The various methods of employing one lens for securing the binocular negative, viz., the movement of the camera, the lateral movement of the lens, and the displacement of a sitter were next described, and the latest plan, that of employing a frame holding two inclined mirrors which transmit two images through the lens, was also detailed. All these systems he described as more or less of a makeshift character, and he strongly advised the photographer to employ a pair of lenses for the purpose. The camera, septum, shutter, and lenses were next referred to, a separation of three inches for general work being advised, and the imperativeness of the lenses having identical foci and apertures being pointed out. Iris diaphragms, on account of their liability to give unequal apertures, were not recommended. He incidentally mentioned that stereoscopic work demanded the highest definition all over the picture, and thus allowed of no eccentricities in the way of focal treatment. Discussing the cutting, trimming, and mounting of the prints, he laid down the importance of the foreground centres not exceeding three inches; the nearer they were to two and a half inches, the more readily the images coalesced in the stereoscope. The method of making stereoscopic transparencies by contact in a printing frame was next illustrated. Adverting to the stereoscope itself, he quoted Brewster as remarking that, "as very few persons have the power of uniting by the eyes alone the two dissimilar pictures of the object, the stereoscope has been contrived to enable them to combine them, but it is not the stereoscope, as has been imagined, that gives the relief. The instrument is merely a substitute for the muscular power which brings the two pictures together. The relief is produced . . . . solely by the . . . . play of the optic axes," and condemned most of the stereoscopes on the market as being deficient in the necessary lateral and vertical movement of the eyepieces. They should also, he thought, have screw-focussing adjustments. Inasmuch as the principal function of the stereoscope was a magnifying one, he recommended photographers to acquire the faculty of seeing stereoscopic photographs stereoscopically without the aid of a stereoscope. This, he said, could be done by taking a binocular print, cutting it, holding the cut halves, with the centres at, say, two inches, at a distance of about twenty inches from the eyes and looking over the prints at a remote object. A third image would apparently be formed in the centre, and, when this could be seen in relief, the prints should be separated a little more and the operation repeated several times. He concluded by advancing a plea for stereoscopic hand-camera work, and passed round a large number of prints illustrative of the defects to be met with and avoided, and showing the adaptability of stereoscopy to portraiture, interior work, book illustrations (collotype), &c.

A discussion followed, in which Messrs. Everitt, Hodd, Debenham, Child Bayley, Henderson, and others took part.

PHOTOGRAPHIC CLUB.

JUNE 5, Mr. R. P. Drage in the chair.

Mr. E. J. WALL read a paper upon *The Use of Coloured Screens in Photography* [see page 375], illustrated by many experiments with a projected spectrum.

Mr. J. HOWSON, referring to a remark of Mr. Wall's, that an optically worked screen was not absolutely necessary when copying a picture, asked if Mr. Wall held the same opinion concerning a landscape?

Mr. WALL agreed that an optically worked screen was necessary for landscape.

Mr. CADETT said that it was his aim, and he thought it was also that of other plate-makers, to make a plate that could be used without a screen; but, when this was arrived at, the plates would practically have to be worked in darkness. He confirmed Mr. Wall's remark that it was a mistake to depend on printed colour charts when testing plates.

Mr. BEDDING asked if practical experience had confirmed Mr. Wall's statement that the new screen he had spoken of did not increase the exposure?

Mr. WALL replied that this was the case.

Mr. BARNES, referring to Mr. Wall's remark that at mid-day in summer a screen was not necessary, said that his results must be entirely wrong, for they did not agree with Mr. Wall's. He added that, in many cases, when photographing flowers, a screen was necessary.

Mr. BIRT ACRES, Mr. FRY, and other gentlemen also made remarks, and Mr. Wall was accorded a hearty vote of thanks.

Hackney Photographic Society.—June 4, Mr. R. Beckett presiding.—After the preliminary business had been transacted, demonstrations on development were given by Messrs. Grant, Self, and Hudson. Mr. Grant's method was as follows:—Make up stock soda solution by dissolving two ounces of washing soda in sixteen ounces of water. For use, take half ounce of this and make up to two ounces with water, then add a small quantity of dry pyro—say one grain. When all detail has appeared on the plate, if necessary, a solution stronger in pyro may be used to get density; but, with this developer, great density is not desirable, as, on account of the yellow stain, the negatives print well, even though the image be thin. Mr. Self uses a mixture of metol and hydroquinone as follows:—Solution A: Metol, 40 grains; hydroquinone, 40 grains; soda sulphite, 120 grains; water, 8 ounces; dissolve in order given. Solution B:—Potass carbonate, 1 ounce; water, 1 quart. For normal exposure, take one part A, two parts B. For over-exposure, less of B; dilute with water, or add a few drops of bromide, but only the latter when the plate is much over-exposed, as bromide acts very powerfully in this developer, and gives great contrast. For under-exposure, use up to four parts of B.

Bath Photographic Society.—The summer excursions of this Society commenced on Wednesday last with a trip by road to Stourton, adjoining Stourhead, the seat of Sir Henry Hoare. By a previous arrangement, several members of the Selborne Society joined the photographers on the occasion, the subjects of interest being equally numerous for each. Permission was readily granted to the organizers by Sir Henry, who is in readiness. Descending to the hamlet, the most noticeable thing is the church, almost imbedded in trees and surrounding foliage, facing which are some pretty cottages, and the entrance to the pleasure grounds. The first important feature within the gate is the old High Cross of Bristol, erected in College-green about 1373, and removed hence about a hundred years ago. It is now under process of complete restoration. Almost immediately the lake is reached—a fine body of water some thirty acres in extent, and skirted by delightful woodland groves fully two miles in length, with here and there a bridge, a temple, or massive grotto work to enhance the scene, the whole lying in the bosom of wooded hills and perfect landscape. Passing round the lake and through the principal grotto, where, in one of the recesses, reclines a marble nymph, "with appropriate lines" of A. Pope inscribed in the rock; and in another recess is a figure of the river god, from whose urn the Stour, collected from the six wells, is poured forth. Just beyond, is a fine temple, having a portico the exact copy of the Pantheon at Rome, and within its walls are several statues, and other works of art. The chief, however, is an antique marble of Livia Augusta in the character of Ceres. This work, in perfect preservation, is a relic of Pompeii. Just now the rhododendrons are in full bloom, which adds greatly to the variety of colour from any given point of view in the grounds. A capital tea was served at the Spread Eagle Hotel, Stourton, and at seven p.m. a start was made on the return journey. The excursion was altogether an enjoyable one, and included a drive of nearly fifty miles.

Leeds Camera Club.—About a score members turned up at the Leeds Central Station at the early hour of 4.30 a.m. on Monday last, to undertake the long journey to Windermere, with a view of obtaining some impressions of the Lake District. Windermere was reached about ten a.m., and after partaking of light refreshments the party broke up into two sections. Several members, including the President, drove to Grasmere by *char-à-banc*, and on arrival about midday, were met by a small contingent of the Leeds Camera Club, who had been spending the holidays at Keswick. Cameras were soon brought out, and, although the weather was not as favourable as one could have desired, yet numerous exposures were made on the ancient church at Grasmere, the lake, the village, Rydal Water, and other beautiful bits with which the district abounds. The party walked from Grasmere to Ambleside, and by this means managed to obtain some of the most picturesque spots in Lakeland. The other section, in the meantime, had climbed Orrest Head, from which one of the finest views of Windermere Lake is obtained. After this they rowed up the lake to Waterhead, and then visited Stock Gyhll waterfall, where several good views were secured. The members of both sections were photographed during the day. One of the secretaries of the Lake District Camera Club, with which society the Leeds Club has recently become affiliated as honorary members, met the party on arrival at Windermere in the morning, with the object of giving all the information he could as where and how to spend the time to best advantage, and obtain what each one desired—beautiful reminiscences of the Leeds Club's visit to Lakeland.

ON Whit Tuesday several members of the Club visited the picturesque village of Barwick-in-Elmet, to witness the raising of the May-pole on the village green. Delightful weather favoured the party, and some excellent negatives were secured.

A NUMBER of members paid an informal visit to the Isle of Man on Saturday last, returning on Wednesday. They, of course, made Douglas their headquarters, but during the stay Injebreck, Sully Glen, Grondle, Laxey, Port Soderic were "worked" and satisfactory results obtained.

Leeds Photographic Society.—The Ordinary Meeting of this Society was held in its rooms on Thursday evening last, when the PRESIDENT (Mr. J. H. Walker) lectured on the *Tele-photo Lens*. By means of illustrations on the screen the advantages to be derived from the use of such a lens were illustrated, and also the different factors which governed the exposure. On the conclusion of the lecture, an animated discussion ensued, in which Messrs. Addyman, Wahburton, and Pearson took part, the latter explaining new features in connexion with the latest Zeiss lens. Subsequently, lantern slides taken on the joint trip with the Sheffield Society some few weeks previously were thrown on the screen, amongst them being some very successful sets by Messrs. H. Denison, the President, and Dr. Thresh.

FORTHCOMING EXHIBITION.

1895. June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

ELECTRIC LIGHT FOR THE LANTERN.

To the EDITOR.

SIR,—On reading the article in this week's JOURNAL on *Electric Light for Lanterns*, it reminded me of the very pretty and simple arrangement used by our old friend Hart in Edinburgh. You may recollect that he had the upper carbon—the wasting one—attached to an iron rod which was supported, magnetically, in a coil of wire. The current passed through the coil when the carbons touched and when the light was produced, if anything disturbed the current, the rod dropped and the carbons touched, and in an instant it jumped up to the proper distance for producing the light. I saw it used by Professor Smyth at the Society of Arts for showing some of his pictures, and, so far as I recollect, it was remarkably steady, while the occasional breaking and remaking of the contact was so instantaneous as to be scarcely observable. There was no machinery or complication about the burner, and I have often wondered why it is not used in preference to the complicated Siemens and other burners of the present day. But, as I am no electrician, I may be gabbling about things that I do not understand.—I am, yours, &c.

Brook Cottage, Ashburton, South Devon. GEO. H. SLIGHT.

"TRADE PRICES."

To the EDITOR.

SIR,—My attention has been called to an article in a pamphlet entitled *Autotype Notes*, in which it is stated that the firm of Elliott & Son, of Barnet, have endeavoured to secure work from those outside the profession at trade prices, at the same time pretending to work exclusively for the profession. I therefore take this opportunity of contradicting this statement.

When I joined the firm, my instructions were that *trade prices* should *only* be quoted to professional photographers and recognised dealers in photographic material, and these instructions I religiously carried out. As I had the entire business control of the works, I am in a position to most positively assert that every precaution was taken to prevent the firm's net price-list falling into the hands of outsiders, and, in all cases where an order was received from any person unknown to the firm, such person was, per return of post, asked for his business card, and if this was not forthcoming such work was quoted at fifty per cent. (fifty per centum) higher than the prices charged to the profession. This invariably led to the work being taken out of Elliott & Son's hands, and placed with some of the less scrupulous trade enlargers.

Under the circumstances, I trust that you will give this letter publicity in your columns, as I consider it regrettable that a firm which has sacrificed a large amount of outside trade solely in the interest of the profession should have untrue accusations levelled against them by such a responsible firm as the Autotype Campany.—I am, yours, &c.,

BIRT ACRES, LATE *General Manager, Elliott & Son, Barnet.*

Clovelly Cottage, Barnet, Herts, June 7, 1895.

[We may add that since receiving the above letter we have seen the head of the firm of Elliott & Son, who most emphatically endorses the statements of Mr. Acres, and, who says that the quoting of their price-lists, as alleged, has been done entirely without their knowledge or consent.—ED.]

LENS TERMS.

To the EDITOR.

SIR,—While I am quite aware that photographic lenses are tested, and the limits of their performance certified at Kew Observatory, and that certain manufacturers accurately describe their goods, I think that the vague terms now in use regarding lenses should be abolished altogether.

The mounts, the screens, and the diaphragms have been accurately standardised, but the much more vital functions are described in language the very reverse of *crisp*. There may be reasons for this consensus of "fuzziness," for it is by no means confined to one stratum of photographic writers. In the hope that an abler pen than mine will advocate "a code," I refrain from illustrating the present outer darkness.—I am sir, yours, &c.,

OPTICIAN.

AUTO-ORTHO-CHROMATIC—ANOTHER EPISODE.

To the EDITOR.

SIR,—I, too, have been honoured (?) with a visit from the flippant scientist of slight build, blue eyes, fair complexion, who speaks English very fluently, but with a foreign accent. Yes, very fluently; thus he gives himself away, as he glibly rattles off the names of all those who have studied and worked in the field of colour photography, in company with himself at this university and that university.

I felt quite overpowered by his white waistcoat, crossed by a gold-coloured chain, with a pedometer at the end of it (as I afterwards found out), his bright leather boots, expensive light pants, and faultless fitting coat, all a little worse for wear.

"And you have never heard of my name?" slipped out of his flexible mouth.

"No," I replied, "but I have heard of all the others."

I now began to feel more possessed in his presence, and took up an adamant sort of position, as what little penetrating power I possess began to realise the man's calibre and the hollowness of his pretensions, and I anticipated the request which eventually came from him.

"Could I give him a little too assist, as zey had kept all my instruments and dings at ze hotel, and I pawn dis? No; it is of little value not being a vatch," as he produced the pedometer at the end of his chain.

This concluded our conversation, and to get rid of him my adamantine front dissolved, and he departed one shilling the richer, after after setting my brains in a whirl with all the high-sounding names of recent and ancient research in the chemical world, samples of which, each and all, were in durance at "ze hotel," probably the monococylmetadihydroxyl-benzolzirconallylauromethylphtalem compound among the number.

And thus the ever changing kaleidoscope of character rolls before our eyes, and talent is wasted, for clever he was in the *rôle* he had taken up.—I am, yours, &c., W. BARRY.

Hull.

THE PHOTOGRAPHERS' BENEVOLENT.

To the EDITOR.

SIR,—A great deal of correspondence has appeared during the last few weeks in your columns respecting this society, and for this last ten or twelve years, to my knowledge, assistants as well as masters have practically ignored its existence and noble aims. What I think at the present time is wanted is to turn the Association into a sick benefit and self-help society; assistants as well as masters are very loth to ask for charity in time of need, and, as at present constituted, the Benevolent savours very much of this. A society I belong to, besides giving sick benefit, also acts as a savings bank at the same time, giving members interest yearly on their deposits, and at the age of sixty-five years members withdraw all capital with interest standing to their credit, or may purchase an annuity for the rest of their lives. Members can join at the age of sixteen years and up to sixty years, and can take from half a share up to as many as three shares, so that they obtain various sums in sickness from five shillings per week for half a share ten shillings for one share fifteen shillings for one and a half shares, twenty shillings for two shares, and thirty shillings for three shares. Every member is put upon an equal footing, if a young man joins, say, at sixteen years, and pays sixpence per week, the next year he pays sevenpence, and so on, increasing his payments by one penny each year, for every year he remains a member. Should a member die, a levy is made among the members to meet this, members who have ten pounds standing to their credit in the society are exempt from this levy. Should it be a member's wife whose death takes place, every member of the society subscribes to this levy. Members can at any time withdraw from the society by leaving two years' contribution, withdrawing all other capital standing to their credit, but can still remain a member if they wish it.

Now, sir, I think you will admit that a society formed on these lines is one of the finest self-help sick benefit societies in existence, and I commend it to both masters and assistants alike; perhaps I may be met with the argument that most assistance belong to some benefit society, such as the Foresters or Oddfellows. This, no doubt, is quite true, but, then, there is not the benefits, and besides, sir, there are the rising generation to be thought of. As to helping members of the society in distress, this could still be carried on by forming a benevolent fund, to be met by levy among the members. The way this could be carried out would, of course, be left to the committee of management, but I would suggest one penny per month for the first twelve months, till a fund was obtained for this purpose; then, as occasion might require according to amount of distress to be met, every new member joining should be required to subscribe to this levy for the first twelve months. If, sir, you will kindly insert this in the next issue of the JOURNAL, no doubt the gentlemen of the Committe of the Photographic Benevolent will give my suggestion careful attention, and so raise the present existing society from a state of apathy (for want of funds) to one of affluence. Anything I can do to help such a society, by becoming a member myself or persuading others to join, I will willingly do; in conclusion, may I ask your readers,

masters as well as assistants, this question, If the Society is reformed on these lines, who will join? I hope my professional brethren will have made a point of attending at the White Swan on June 11, to discuss the future of the Benevolent with its founder, Mr. Wilkinson. I enclose my card, and am, yours, &c., A WELL-WISHER OF THE PHOTOGRAPHERS' BENEVOLENT.

MESSRS. CADETT & NEALL'S INTERNATIONAL COMPETITION.

To the EDITOR.

SIR,—We shall be extremely obliged if you will mention in your columns that the last day for receiving prints for the International Prize Competition for Professional Photographers closes on the 30th inst.

Thanking you in anticipation,—We are, yours, &c.,

Ashtead, Surrey, June 7, 1895. CADETT & NEALL.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PROFESSIONAL.—The subject is one that cannot well be discussed in these columns.

F. L. S.—To reduce a negative that has been over-intensified by mercury and ammonia, treat it again with mercury alone.

M. I. ASKEW.—The high lights may be reduced by an ink-eraser, or by scraping them out with a penknife. We know of no more effectual method.

A. B. C.—1. You cannot do better than employ the Platinotype Company's salt. 2. Presumably because they are more suitable for the development of that paper.

M. W.—One can scarcely be surprised at the dish behaving as it did. Probably you are not aware that xylonite and celluloid—an analogous compound—are soluble in spirit.

D. A. B.—1. Yes; instead of the ammonia, you can blacken the bleached image with sulphite of soda or ferrous oxalate.—2. See the ALMANAC, which has several formulæ for intensifiers.

£ *s. d.*—There is not the slightest possibility of your being able to dispose of the old negatives to any of the plate-makers for the glass. You will have to seek some other market for the two-and-a-half gross of quarter-plate negatives.

J. WOODS.—If the gelatino-chloride paper got so damp that the sheets have stuck together, the only thing we can suggest is to throw it away. If you succeed, by redamping it, in separating the sheets, they will be of no use for printing upon.

H. STONEMAN.—Unless you are a certified chemist you will not be allowed to sell the poisons scheduled in the Act, even if they are sold in solution for photographic purposes. It would be illegal to sell a solution of cyanide of potassium, for example.

J. W. R.—We should say the trouble is not with the silver, but with the water in which it is dissolved. The price paid for the nitrate was such as would secure a good article from a good house. Perhaps you are not aware how cheap silver is at the present time.

CELLULOID.—If the thin film negatives are smaller at the top and bottom edges than they are in the middle, there will be great difficulty in securing perfect contact all over the picture in the printing. That is not an uncommon trouble with some of the thinner films. The only thing to do is to use plenty of pressure in the printing.

C. CHARLES.—Although many negatives are printed from without their being varnished, there is great risk in doing so unless the negatives are well washed and the paper is perfectly dry. Many a valuable negative has become stained and spotty, and quite ruined, through not being varnished. The trouble of varnishing the negatives is next to nothing.

B. O. W.—There is no novelty in the fact that sandarac by itself dissolved in methylated spirit makes a varnish that can be used for negatives. It must, however, be kept in mind that such a varnish is by no means a durable one, as it will not stand much rough usage. Either of the varnishes given in the ALMANAC will be better than a simple solution of sandarac.

N. W.—Carbon enlargements can be made direct from the small negative, but not in the way you suggest. The tissue is not sensitive enough to be used by diffused daylight even from a direct north sky. To obtain direct carbon enlargements, a solar camera is required, and the objection to its use is the scarcity of continued sunlight in this country—particularly in London.

G. ELLIOTT.—1. The coated side of the paper usually curls inwards; if that which you use fails to do this, apply the tongue to the surface at the corner, and the presence of the gelatine will thus be detected. 2. If you only want a general idea, see the *English Mechanic* for May 31. 3. We cannot help you here without fuller particulars. Probably insufficient washing or some other defect in the manipulation.

E. H. HAZELL says: "Can you give me a remedy to prevent the glass in my show-case from veiling over, owing to water or damp condensing upon it? I have airholes, one inch in diameter, covered with muslin, but this does not seem to be of any use. I may mention, the back of it is exposed to the sun; also the front early in the morning only."—Try the effect of treating the surface of the glass with glycerine.

WALES.—It is impossible to say whether you will be able to sell the negatives you are going to take on your holiday trip. If the work is good and artistic, it can be submitted to some of the publishing houses; but, unless the negatives are first-class, artistic, and of views of interest, there is no prospect of their buying them. They must be very much better than the general run of amateur photography to meet with a purchaser.

F. A. W. E.—Unless it can be proved that the mounts are the cause of fading, it will be useless to expect the agent who supplied them to refund the amount paid for them, and pay you 10*l.* as damages for the injury to your business. Because many prints mounted on these cards have faded, it is no proof whatever that the cards are the cause. There are many causes for the fading of silver prints besides mounts, and these mounts have not been even tested to see if there is anything wrong with them.

C. C. H. says: "A traveller, a few months back, came into my shop (a stationer's) and offered me some scraps—silver prints—copies of pictures. As the price was low, I bought a good number of them. The other day another traveller called on me, and saw some of them, and told me they were piracies, being reproductions of the copies of pictures which are copyright. Will you please tell me if I run any risk in selling what I have left, as I bought them in good faith, and it will be a great loss to me if I do not sell them?"—By selling the prints, you render yourself liable to a penalty for each one, as well as for damages in addition. Ignorance is no bar to the actions,

T. HILLWAY says: "I have read somewhere that, by shortening the tube of a rapid rectilinear lens, it will include a wider angle; I mean that it will then cover a larger plate than it was intended for. Will you please say if that is correct?"—It is quite correct that, by placing the glasses closer together, the lens can be made to cover a larger field, but only at the expense of some of the qualities of the instrument. Its field will be rounder, and it will have to be worked with a smaller stop than would be otherwise required. Instead of mutilating the present mount, we should advise to have a new mount made into which to screw the lenses as occasion may require, keeping the original one intact.

A. says: "I should take it as a great favour if you could inform me whether it is lawful to do the following: I was in the public park here this afternoon taking views, &c., when I came across a party of Maypole dancers who were in a position for having their photographs taken by some one else. Thinking I should like to have them, I set my camera and took them at the same time. After I had done this, the other person who had taken them said that I should not have to exhibit same. Could you please say whether he can stop me from exhibiting or selling these photographs, because I think that, seeing the park is a public one, I have as much right as him to exhibit or sell these photographs?"—In reply: Possibly, as the park is public, you were within your legal rights in photographing the group; but, from the moral point of view, you ought to be ashamed of yourself for interfering in another man's business or pleasure.

W. H. M. says: "I should feel extremely obliged if you could favour me with the developing formula for dry plates given, if I am not mistaken, in your BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for 1886, page 139 or 141, by W. Bishop, being modified from one given in the previous year by H. Pratt. It is one that I have worked by ever since published, but some little while back I had the misfortune to lose it. The alkali, as far as my memory serves, was: Carbonate of potash, 8 ounces or 16 ounces (carbonate of soda, 8 ounces); sulphite soda, 8 ounces; water, 8 ounces; the pyro solution preserved with 10 minims nitric acid. I merely give all this as some guide as to the formula I want."—In reply: The following is the formula required:—No. 1.—Soda solution.—Carbonate of soda, 16 drachms; sulphite of soda, 8 drachms; water, 8 ounces. No. 2.—Potash solution.—Carbonate of potash, 16 drachms; sulphate of soda, 8 drachms; water, 8 ounces. No. 3.—Pyro solution.—Pyro, 80 grains; bromide of potassium, 40 grains; sulphite of soda, 20 grains; nitric acid, 10 minims; water, 5 ounces.

CONTENTS.

	Page
CONVENTION POSSIBILITIES	369
PHOTOGRAPHING OIL PAINTINGS	370
JOTTINGS. By COSMOS	371
GELATINO-CHLORIDE UP TO DATE. By W. LINDSAY	373
THE EXHIBITION OF THE PARIS PHOTO CLUB, WITH SOME REMARKS UPON THE POSITION OF PICTORIAL PHOTOGRAPHY IN FRANCE. By ALFRED MASKELL	374
A NOTE ON COLOUR-SENSITIVE PLATES AND SCREENS. By E. J. WALL	375
THE EQUIVALENCE OF THE ALKALIES. By G. E. BROWN, A.I.C.	377
COLLODIO-CHLORIDE PAPER. By J. H. HARVEY	378
PRIZE FOR PHOTOGRAVURE	378
OUR EDITORIAL TABLE	379
NEWS AND NOTES	379
RECENT PATENTS	380
EXCHANGE COLUMN	381
MEETINGS OF SOCIETIES	381
FORTHCOMING EXHIBITION	383
CORRESPONDENCE	383
ANSWERS TO CORRESPONDENTS	384

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A TELESCOPIC FOCUSSING FINDER.

Some time has elapsed since, at the Derby Convention in 1886, we submitted for examination a method by which, with the aid of a small pocket telescope, any moving object could be focussed with the acme of sharpness, ready at any moment to be "snap-shotted," for the ground-glass focussing screen of the camera is not required, and the sensitive plate in its slide may remain uncovered until the precise moment for pressing the pneumatic ball.

From letters which reach us frequently, we infer that this useful method is but imperfectly known, even by some opticians, and therefore, in the interests of many, both of the optical and lay world, we will give such a description of it as cannot fail to be understood by even a reader of obtuse intellect, if such there be.

It is founded on the obvious principle that a corrected lens, when directed to any scene, produces at its focus an aerial model of that scene, each portion of which presents the same relative distance to or from any other as do the same portions of the original. In a lens of short focus the whole of this aerial model is on a scale so diminutive and compressed, that, except such portions as are close at hand, the distance relations between the others are too close to enable the eye to distinguish easily between them, and hence we say that everything beyond a certain distance is in equal sharpness. This certain distance being nearer to the lens, the shorter is its focus; but, conversely, the longer is the focus of the lens, the greater is the separation of the component parts of the subject that is being examined, and the farther is that distance beyond which everything is practically sharp.

A little pocket telescope must be obtained, the focus of its object-glass being the same as that of the photographic lens that is being employed. This is of more importance than the fine finish of the telescope body and fittings. To adapt it to the camera it is only necessary that, when the camera has been distended, so that any object shall be focussed on the ground glass as sharply as possible, the telescope must then be focussed on the *same* object, and laid down upon the top of the camera, the eyepiece end being in a position so that the eye can be easily and comfortably applied to it when in subsequent use. It is here, and only here, that the smallest modicum of mechanical skill is required. Our readers will see, each for himself, whether he is equal to the herculean task. It is that the eye end of the telescope be fixed to the ground-glass end of the camera, and the object-glass end to the lens end or front of the camera, the telescope itself being pointed to the object at or near the centre of the ground glass. We do this by sticking a short pin erect in the front and end frame, measuring the precise distance between them, and piercing holes to suit these pins, one each in the ends of the telescope. The telescope must have its sliding fittings made to work so easily that the racking in or out of the camera shall ensure the sliding tubes of the telescope acting in perfect harmony and simultaneity, so that, optically speaking, the pair of lens systems—the photographic and the telescopic—are twin lenses. The simple fitting here described is all that is needed, and, this having been effected, the telescope may be put up, and carried in the pocket, ready to be used at any moment when desired.

How is it to be used, and on what class of subject? Let us suppose it to be a ship leaving or approaching harbour, but constantly increasing or decreasing its distance from the camera; or suppose it to be a group of cricketers or other athletes on a field, some being near and others rather far from the camera. The dark slide is in its place, and the plate is uncovered save for the instantaneous shutter operated by the pneumatic ball. The telescope is placed in its situation and the eye is applied to the eyepiece, the focussing being secured by the rack and pinion of the camera. When the special object is seen to be sharp, it is at once known that such object is sharply focussed in the camera and is in the centre of the plate. The exposure thus can be made at a moment without having to manipulate the dark slide containing the plate.

We have on previous occasions, both in this Journal and elsewhere, spoken of the facility with which the object-glass of the telescope may be made to work in absolute harmony with that of the camera; hence, in this article, we merely assume that both are of the same focus. To again explain the means, simple in themselves, by which both are to be brought to a state of similarity, would require more space than we can at present afford. Suffice it to say that we have one small telescope fitted with optical adapters, each costing but little, but which enable the same telescope to be different cameras and lenses fitted with any lens ranging between five inches and twelve inches in focus. But, owing to the greater range of definition of a short-focus lens objective compared with one of long focus, it will be among those of the latter class that this arrangement for accurate focussing will have its greatest success.

PROFESSIONAL PORTRAITURE: A BUSINESS MATTER.

MIDSUMMER is with us, and it may be opportune now to look at the present state of the portrait business and its future prospects. Although the portrait season is yet young, we are pleased to learn that, on the whole, "things are looking up," particularly in the higher-class studios. This is a subject for congratulation after the general depression of the last two or three years—may the improvement continue, and still further increase. Portrait photography, as a business, it is to be feared, will never again see the palmy days of thirty or so years ago; nor can it well be expected—there are too many professionals in the field for that. Gelatine has advanced photography, as a business, in every direction but in portraiture. Here it has done just the reverse by overstocking the market.

When collodion was *the* process, a certain degree of skill was necessary to produce a presentable negative. Now, when the plates are supplied ready for the camera, the case is materially different. Hence the simplicity of the work, and the imaginary enormous profits to be made by it have brought a great influx into the business, with the result to be so generally deplored. However, there is an old adage, "What can't be cured," &c. The only thing to be done is to look upon the bright side of things, and endeavour to improve them as much as possible. It has frequently been said that what is required to give a fillip to business is some new style of portrait, or picture, to create some such *furore* as did the *carte-de-visite* when it was introduced. Unfortunately, however, no such novelty appears to be forthcoming in the near future. There is no reason, however, why professionals should not introduce more in the shape of novelties than the majority do. Although the introduction of them may not largely increase the returns, every little is a help in hard times. But what novelties are there to be introduced? That is not a question easy of answer. Suggestions are being made in some quarters to once more reintroduce ceramic photography, and we sincerely wish it every success, though we must confess we are not at all sanguine in the matter.

It is by no means necessary that a thing be new to be brought forward as a novelty if it be reintroduced at the right time. The practice of ceramic photography is not at all difficult, neither are the appliances for its working, for sizes up to four or five inches on soft enamels, at all costly. It is now something over forty years ago that Lafon de Carmasac produced excellent burnt-in photographs that have never yet been surpassed, and from that time, or soon afterwards, up to the present, others have done equally as good work. Yet it has never proved any great commercial success, although the number of workers has always been exceedingly limited. It is doubtful if the number working the process contemporaneously at any one time in England could not be counted on the fingers—possibly of one hand only. Some firms at home and abroad, with agents here, have taken up the subject vigorously to work for the trade, in sizes up to fifteen inches and more, on enamels, porcelain, plaques, and earthenware, but eventually they gave it up, because they found that, beyond orders for specimens, the business did not extend.

It was surmised by some of the sanguine ones that, when the Princess of Wales had some of her photographs put on to a tea service, it would, by setting a fashion, give an impetus to ceramic photography, but it did not. The commercial failure of ceramic photography has not been on account of the quality of the work produced, but simply because there has been no demand for it. The general public, from the very first, have never taken to it. One thing to be considered in connexion with the introduction of any novelty is the ultimate disposal of the picture. Ceramics cannot be put into albums, and they are scarcely adapted for framing. Brooches and lockets, with miniatures in them, which used to be so much in fashion when enamel photographs were first introduced, are now things of the past. It is for these reasons that we are, as we have just said, not very sanguine as to the commercial success of ceramic photography.

There is a style of picture that, at the present time, portraitists might do well to consider the resuscitation of, particularly as it can be done at once—this season—without anything to learn or any outlay for appliances. We allude to stereoscopic portraiture. Those of our older readers will well remember the charming stereoscopic Daguerreotypes that used to be taken by Williams, Kilburn, Claudet, Paine, and others, and the prices they charged for them. Many of the present generation of sitters have never seen a stereoscopic portrait, and the stereoscope is now seldom seen in a photographer's reception-room, and, when perchance it is, it is not in connexion with portraiture. After the Daguerreotypes became extinct, stereoscopic portraits were produced on paper, but the results were not pleasing, on account of the rough surface of the albumen paper then employed. The case would be different now with the highly glazed paper of the present day; but, what would be far preferable to paper prints, and what we would recommend, are transparencies on glass of a pleasing tone, and they would be the greater novelty.

It might be said that every one nowadays does not possess a stereoscope; but that is of little moment, as there are in the market very useful hand stereoscopes that are sold for about eighteenpence or so, and these the photographer might supply as well as the portraits. It is very probable that, if some good and striking specimens were shown in reception-rooms with an inexpensive, though efficient, form of stereoscope, such as those just alluded to, it would be the means of increasing the returns of many. The present may be an opportune time for the experiment, seeing that stereoscopic photography is so steadily progressing amongst amateurs, and that there are few families that do not include one or more of them within their circle.

Wood-engravings *versus* Process Blocks.—"Seeing is believing," says an old proverb. We quote it *àpropos* of an article in the current issue of *Wilson's Photographic Magazine*, in which the editor, speaking of some remarks made by us a few years since relative to the superiority of well-executed wood-engravings over process blocks for book illustration, clenches the matter by showing, almost side by side, four pictures from the same negatives, two printed from the wood, the others from process blocks. The subjects selected are from a series taken by the editor (Edward L. Wilson) when on a tour in the Holy Land several years since, and are respectively a view of the *Mount of Olives* and of the *River Jordan*. We had inquired, "Does not a well-executed engraving on wood, after all, form a better pictorial illustration than a phototype?" and we went on to say that, while this latter, including heliogravures, process blocks, *et hoc genus omne*, were invaluable as showing the whole thing, and nothing but the thing contained in the negative, including stains, spots, dark corners and all, the skilful engraver, while adhering strictly to his principal theme, and reproducing *it* with an accuracy that was marvellous, does not perpetuate the small excrescences and defects which may sometimes be found on even the most valuable

negatives. In this respect a wood-engraving, conscientiously prepared and well printed, may be made to take a far higher rank than a photograph printed in facsimile. This view is confirmed by a comparison of the two sets of pictures above named. Take the *Mount of Olives*, for instance. The one is a photograph, accurate, without doubt, in every detail, and just as any one could see it for himself. The other is all this, but it is also a work of art, while conveying a better idea of the not very lovely, although interesting, scene than the bare photograph. This also applies to the view of the *River Jordan*. The artistic and executive skill of the higher class of New York engravers, and the admirable manner in which their productions are printed have long been recognised in this country; and, when we state that the translation of Dr. Wilson's photographs into line have been made by the skilled engravers of the Century Company, New York, for use in the *Century Magazine*, and subsequently in the valuable volume *In Scripture Lands*, all wonder at their accuracy and excellence will cease. The prices paid for illustrating a book in America by the joint agency of photography and engraving are very high; and, considering the remarkably moderate prices at which such books are sold, it indicates great enterprise and enormous circulation. We specially direct attention to the following paragraph.

The Illustrated Press and Photography.—The opinions of a man like Sir W. Ingram, the director of the *Illustrated London News* and other well-known pictorial publications, with reference to the use, for illustration purposes, of reproduced photographs, must command much attention at this juncture. He was the subject (or victim) of an interview recently published in the *Publishers' Circular*, and here are his utterances on the question immediately concerned:—

"'What is your opinion about photo-process work, Sir William?'

"'I think that the public will in time become tired of mere reproductions of photographs.'

"'You think, then, there is a good time coming for artists?'

"'Yes, and there will arise a new school of artists who will be required to compose drawings from photographs. These photographs may be portraits or photographs of events. Of course, this will not cause the former demand for wood-engraving at once to revive, as, in many cases, these original drawings will be reproduced by what is called the etching process. At the same time, it is my intention to introduce into the pages of the *Illustrated London News* more wood-engravings than have appeared for some time past.'"

The opinion that the public will in time tire of reproduced photographs has been more than once expressed in these pages. Sir William's determination to make an increased use of wood-engravings is just what an intelligent student of the better-illustrated papers might have expected, in view of the enormous number of indifferent photographs which have lately been used for reproduction purposes. Some illustrated newspaper conductors appear to think that any photograph is good enough to be reproduced—or is it that really good photographs are not forthcoming in sufficient numbers?

Measuring Stellar Photographs.—In reading of the measurement of the photographs taken for the great map, a non-expert would see no difficulty in the matter. But such is not the case; the work is difficult, and the apparatus expensive. At a recent meeting of the British Astronomical Association, Professor H. H. Turner, in a paper which he had forwarded, described a simple apparatus for measuring stellar photographs. In the course of some general remarks he pointed out the importance of amateurs choosing and working at a small spot in the sky. Various forms of microscope micrometers, he said, had been proposed for the measurement of position of objects on the photograph, but the simplest of these used in large observatories would cost at least 20*l*. Suggestions for reducing an item of expenditure of this magnitude would probably, therefore, be welcome. A *réseau* was almost indispensable, but the expense of one for an individual would be serious. But why should not the Association purchase such a *réseau* or *réseaux*, and furnish photographic copies to its members? In the actual measurement some microscope must be used, but most of them could find an old microscope somewhere, and it was only further necessary to place a small scale in the common forms of the objective and eyepiece. He gave directions for making such a scale photographically, and, concluding his paper, he said a complete outfit for taking and measuring stellar photographs was well within the resources of any one, and that there was work to be done with it at the present time unlimited in scope, and certain to produce good results.

Scientific Photographs *versus* Fancy Engravings.—Our views on this subject are well known, and the remarks anent it made at the meeting above mentioned bear in the same direction as our own opinions. Mr. Edwin Holmes could come to no other conclusion than that the wood-engraver and the lithographic artist often had their own ideas of how the planets ought to look, and that they touched up the poor amateur's attempts out of pity for his want of skill. The personal equation of the observer they could not hope to eliminate, but he submitted that they could get rid of t... ore objectionable personal equation of the lithographer by substituting the collotype process. Mr. Adams considered that Mr. Holmes had touched on a very tender point. He (the speaker) did not think the reproductions of some sketches in various journals was all that could be desired. This was due in a large measure, no doubt, to the matter of pounds, shillings, and pence; but he did feel that the artist who reproduced these things put a little of "number one" into them.

Photography at Greenwich.—According to custom, the annual visitation was made at Greenwich upon the first Saturday of this month, and many points of interest photographically were touched upon. It was mentioned in the last report that a new photographic telescope of twenty-six inch aperture, the generous gift of Sir Henry Thompson, had been ordered for the Observatory from Sir Howard Grubb. The object-glass had been made and delivered, and good progress had been made with the mechanical work. The work for the great star chart does not seem to have been so successful as might be expected from skilled observers, for we read that, while with the astrographic equatorial of the International Photographic Survey 595 plates have been taken on 125 nights, of these 162 have been rejected from atmospheric or other accidental causes. The region of the heavens allotted to Greenwich for the survey is that within 25° of the North Pole, and the work is now far advanced, at least so far as the plates of the Catalogue series, to show stars down to the eleventh magnitude, are concerned. In the case of the plates for the chart of stars down to the fourteenth magnitude, which require forty minutes' exposure, progress has, for obvious reasons, been somewhat less rapid. Besides the routine work for the survey, several miscellaneous photographs have been taken. Weather has in general been unfavourable for photography during the past year.

Relative Energy of the Spectrum Rays.—At the Berlin Physical Society Professor König spoke on the experiments which, in conjunction with Dr. Rubens, he had made on the distribution of energy in the spectrum of a triplex burner. Dealing with great detail on all the points involved to obtain exact results, he said they had found that the energy of the extreme red was more than a thousand times that of the blue, and even in an amyl-acetate lamp the energy was three hundred times greater.

THE DEVELOPING EQUIVALENTS OF THE ALKALIES.

I AM rather at a loss to decide whether Mr. G. E. Brown is genuine in his belief in the accuracy of his table or whether he is trailing the red herring across the scent with a view of retiring as gracefully as possible from a position which he finds to be untenable. I am rather inclined to the former view, in consequence of the manner in which, in his article last week, he gets himself even more hopelessly mixed than he was before, though the way in which he deliberately attempts

to misinterpret one would lead one to suppose his object lay in the latter direction.

The writer is good enough to quote a passage from my article at page 277, to which he states he must "really keep" me, as I subsequently show an inclination to depart from it. Far from such being the case, I am prepared to stand by the so-called "definition" if Mr. Brown will kindly read it in the light in which it was written. I must again remind him that before he entered into this discussion it was limited to the consideration of the development values of the different alkalies, and was not intended to extend to their alkalimetric estimation from a purely chemical point of view. Mr. Brown interferes without having studied the question, and volunteers what he terms a "correction," which it will be my duty to show in terms plain enough, I hope, even for his comprehension, is a hopeless mass of inaccuracy, and in doing so I shall be as brief as I possibly can. Fortunately I need not wade through or repeat the very elementary calculation and equation which Mr. Brown has introduced into his last article, as with his own figures in the first two he fully proves my case.

Let me, therefore, place those two equations in juxtaposition:—

$$(1)\ \underset{98}{H_2SO_4} + \underset{80}{2NaHO} = Na_2SO_4 + 2H_2O.$$

$$(2)\ \underset{98}{H_2SO_4} + \underset{106}{Na_2CO_3} = Na_2SO_4 + H_2O + CO_2.$$

Now, here it will be observed that the writer, taking *his own* equivalent quantities of sodium hydrate and sodium carbonate, treats each with a like quantity of sulphuric acid, and mark what is the result. In the case of the hydrate the result is a *neutral* salt *plus* a little water; in the case of the carbonate, the result is the same neutral salt and water, but *plus* one equivalent of liberated *carbonic acid*. If the latter were a fixed instead of a volatile acid, the result would be a highly acid solution instead of a neutral one. In any case, unless boiled for some time, a portion of the carbonic acid would remain in solution; but that matters not, for the comparison of the two equations shows that double the quantity of sulphuric acid, or half the quantity of sodium hydrate, would have to be employed in the first equation in order to produce identical results in both cases. In other words, Mr. Brown shows, beyond any possibility of contention, that my figures—*forty* parts of sodium hydrate—and not *eighty*, as he states, are equal, for developing purposes, to 106 parts of anhydrous sodium carbonate.

It is very easy to see where Mr. Brown has, in the first instance, "run his head against the wall," and I cannot help thinking it would have shown a more manly, as well as a more truly scientific, spirit if he had acknowledged his error when he discovered it, instead of attempting to slide off at a tangent. I have an idea that a glimmering of the fact that he was wrong, even in his own figures, must have reached him, as he says, at page 377. "The alkalimetric equivalent of anhydrous sesquicarbonate" (of ammonium) "is half this last number, or 63·5." Now, if he found it necessary to take the half of the figures 127, which head one of the columns in his valuable (?) table, why not extend the process to the others, 80, 112, and 34? But, truly, the vagaries of *some* chemists are inexplicable.

For the sake of those photographers who, not being sufficiently versed in chemistry to follow this discussion may perhaps think that the matter is but a difference of opinion between Mr. Brown and myself, I should like, in a few words, to make clear his line of argument and to show the utter worthlessness, the culpably misleading character of the table he still professes to call accurate. These are strong words; but, if Mr. Brown or my other readers can imagine any stronger, they may consider them applied, for surely, after the explanatory equations I have just given, it is clear to the meanest comprehension that his figures for the caustic alkalies are throughout double of what they ought to be.

The science of alkalimetry consists in the estimation of the total quantity of alkali, whether in the caustic or combined state, contained in any particular sample. The value of an alkali for development purposes depends upon the quantity of oxide or hydrate present either in the caustic state or in the loosely combined state in which it exists in the normal carbonate. The diacid, or bicarbonates, although judged from the chemical point of view alkalies, are really acid salts in most cases; feebly so, it is true, but readily converted into active alkalies. From a photographic or developing point of view, they are quite valueless, or even act as restrainers, and in many solutions, consisting wholly or in part of bicarbonates, the latter may be wholly ignored so far as any developing energy is concerned, although their restraining action has still to be reckoned with.

The figures Mr. Brown has given represent the equivalent quantities of the different alkalies from which a given quantity of sulphuric acid will expel the whole of the carbonic acid in the case of a carbonate or exactly neutralise a hydrate. The figures I have given in my table of developing values represent the equivalents which with the same quantities of acid will be reduced to such a condition that there still remains one uncombined atom of hydrate, or, in other words, until there is a definite and measurable developing action left.

When the hydrates and carbonates come to be compared in these two different manners, it will be found that their relative values differ as do the figures in Mr. Brown's table and my own, because, in the latter, two equivalents of the hydrate are in combination with a dyad acid—Na_2CO_3, and it requires therefore two equivalents of NaHO to neutralise the same quantity of acid; but in the solution of carbonate only one of the atoms of NaHO is available for developing purposes, the other being entirely masked by the acid, and therefore for developing purposes an equivalent of carbonate is only equal to one of the hydrate and not two. A glance at the next equation will tend to further explain the composition of a solution of normal carbonate of soda.

$$(6)\ \underset{\substack{106\\ \text{sodium}\\ \text{carbonate}}}{Na_2CO_3} + \underset{18}{H_2O} = \underset{\substack{84\\ \text{sodium}\\ \text{bicarbonate}}}{NaHCO_3} + \underset{\substack{40\\ \text{sodium}\\ \text{hydrate}}}{NaHO}$$

That is to say, 106 grains of sodium carbonate dissolved in water is precisely similar in character and action to a solution made up of or containing eighty-four grains of bicarbonate and forty grains of hydrate. Therefore, forty grains of the latter alone must be *at least* equal in developing value to 106 grains of the carbonate, in which the same quantity of the hydrate is held in check by the restraining bicarbonate. The funniest part of Mr. Brown's argument is, that if he were correct *eighty parts of caustic soda without any restrainer would only be equal in developing value to eighty-four parts of bicarbonate!* Oh, dear!

W. B. Bolton.

[The discussion of the above subject has now exceeded the extreme limits of its interest and value, and we therefore do not invite our friends further to continue it.—Ed.]

EMULSION FOR THE LIPPMANN PROCESS.

In an editorial article in The British Journal of Photography for June 7, this subject is dealt with at some length, and, while the article makes many suggestions, some of which are likely to prove very valuable to the experimenter in this direction, it has, I am afraid, not quite grasped the excessively fine state of division which is necessary to success in the process, and, at the same time, exhibits greater readiness than I should care to in assuming that in such films the degree of coarseness depends upon the same conditions, no more and no less, as it seems, as far as we can tell, to do in the case of more rapid gelatino-bromide emulsions.

Both Mr. A. L. Henderson and the article in question agree in stating that in the jelly stage "the particles of silver haloid undergo no further change," and, in this matter, point out that they differ entirely from me. Had I been writing about the emulsions to which most experimenters are accustomed, I should certainly have used some such expression as these authorities do. They are undoubtedly correct in saying that in the *comparatively coarse* and granular emulsions, such as the finest of those in general use are, the particles do not increase perceptibly in size, even when kept for prolonged periods in the condition of jelly. With the exceedingly fine grain which the process of MM. Lumière yields, the case is very different, and I am driven to the conclusion that the degree of fineness necessary has not been grasped, especially when the expression, the "blue or granular stage," is used, as if any stage but the "blue" was not a granular stage. For the purposes of interference experiments the "ruby" stage would be hopelessly coarse and useless.

The emulsion prepared by the method laid down by MM. Lumière is, at the moment of emulsification, quite clear and transparent, and in this condition is in the finest state of subdivision; this is the most desirable form in which to employ it. To realise its appearance without seeing it, all ideas gathered in the manufacture of the usual forms of emulsion must be put on one side, since by visual examination it might be taken to be simply a solution of gelatine. This appearance is due *not* merely to the small proportion of silver bromide present, since, if an ordinary emulsion is diluted with gelatine solution to the same extent, it would be anything but transparent, but it is due to the excessively fine division of the salt. If this emulsion is set and washed in the usual way, or if it is precipitated with alcohol and washed, it will be found, in the course of either operation, to grow gradually opalescent, until in time, in spite of the fact that it contains so small a proportion of silver to the ounce, it is almost as opaque as an emulsion prepared with a view to speed. If, instead of washing the emulsion in the jelly form, it is stood on one side for a day or two, it will be found in the same way to become gradually opalescent and coarse. Let me here repeat, however, that by coarse I do *not* mean visibly granular, but merely too coarse for the interference process. The best test for coarseness is simply that the film, to be sufficiently fine for the most successful results must be perfectly transparent, and to obtain this the only way I know is to proceed on the lines laid down by the brothers Lumière. That, contrary to the opinion of Mr. A. L. Henderson, and that expressed in your article, a change in the direction of coarseness takes place while the emulsion is kept in the jelly form can easily be shown to be the case by simply making such an emulsion carefully, observing it closely at the time of manufacture, and then allowing it to set. It will probably be opalescent and useless in twenty-four hours. In every case in which I have kept an emulsion anything more than a few minutes the change has set in. So rapid is it in the fluid emulsion at 40° C. that, in coating a number of plates, the appearance of the emulsion is distinctly different when the last is coated to that which it presented at the commencement of the operation.

It is, moreover, objected in your article that the method of washing the plates rather than the emulsion in bulk, which is referred to as a comparatively roundabout method, and one in which there is danger of mechanical damage. What there is "roundabout" in a process which allows, nay, compels, a couple of dozen plates to be made and dry within an hour and a half of the emulsification is difficult to see, while the great rapidity with which the operations can be carried out reduces the time during which there is any danger of mechanical injury to a minimum. In the same way, when one realises the treatment that the gelatine undergoes—being dissolved at a temperature not exceeding 40° C., coated, immersed for half a minute in alcohol, rinsed in cold water for ten minutes, dried in about half an hour, for these thin films rarely take longer—the sample of that substance must be a particularly bad one for there to be any real chance of decomposition setting in during drying, which is apparently feared in your article.

That article contains suggestions of processes for obtaining fine-grain films, which I shall certainly attempt. It is by reason, indeed, of its value that I lose no time in writing to point out the misunderstanding that appears to have arisen, which turns, I think, upon the use of the word "granularity" by me in the sense of everything coarser than the degree of fineness represented by transparency rather than in its generally accepted sense of a degree of coarseness undesirable in a photographic film for ordinary work. I cannot help thinking it unwise, moreover, to conclude too quickly that the growth of the particles in these excessively fine films takes place exactly in the same way as it appears to us to do in the very much more granular films in every-day use.

R. Child Bayley.

A PROMISING PRINTING PROCESS.

[Croydon Camera Club.]

Two reasons have impelled me to bring before your notice a paper, and a particular method of toning it, regarding which I ask the favour of your attention.

The first reason is that my own experiences and the observation of other people's experiences have led me to be very much dissatisfied with the gelatino-chloride paper at present so largely used. Without entering deeply into all the objections to the above paper present to my mind, enough that they include a considerable tendency to double tones, an oftentime unpleasing colour of tone, and a frequent inclination to give hard prints where negatives of full pluckiness, such as are usable with platinotype or albumenised paper, are printed from. Above all, however, is the feeling that no reliability can be placed upon the permanency of the image impressed on the gelatine paper, of which more anon.

The second reason which led me to address you is that my attention was very forcibly directed to the advantages possessed by collodio-chloride paper by our much-esteemed member, Mr. Harry Letts. Lately returned from a prolonged stay in Switzerland, he favoured me with an inspection of a number of whole-plate Alpine views—many of which have been reproduced in the sixpenny illustrated London weeklies—which at first sight I took to be platinotypes of remarkably high quality, as regards full range of vigour and fine rendering of the nicer passages of half-tone. Mr. Letts, however, quickly disabused my mind, informing me that nine-tenths of his collection were collodio-chloride prints toned by the method I shall presently explain to you. I could have wished that my task had been undertaken by Mr. Letts himself, who was most willing to take it upon himself, but pressing engagements have called for his presence in a distant part of the country. I have therefore refreshed my memory regarding this particular paper, and have made some trial of the brand of paper and the system of working it which Mr. Letts has adopted with so much success.

It will, perhaps, be not amiss if, at the outset, I say a few words respecting the comparative virtues of collodion and of gelatine sensitised papers. It should never be lost sight of that, as Mr. W. J. Wilson points out, the disadvantages of gelatine chloride paper are due partly to the physical and partly to the chemical properties of gelatine; thus it absorbs water with great avidity, the film freely swelling and softening when wetted; hence not only is the surface liable to injury until bone dry, but the interstices of the swollen layer of gelatine become difficult of access to the washing water, which cannot readily, if at all, remove all the soluble matter which should come away; this same physical characteristic is partially the reason why uneven toning frequently ensues.

The light half-shadows lying more upon the surface of the gelatine film are soonest reached by the toning agent, whence toning not only begins, but is finished, before the fluid employed in the toning has permeated far enough into the congested mass of gelatine to reach the deeper-lying parts of the image which composes the dark shadows. It follows that, in order to tone the latter, the treatment is so prolonged that the half-lights become grossly over-toned, with the usual result of an unpleasant, flat, and cold appearance.

Collodio-chloride paper is coated with a film which is of a non-absorbent, non-swelling character, and is one of considerable thinness as compared with the gelatine papers. Hence preliminary washing being unimpeded is thoroughly carried out in a short time, little or no unacted-upon silver being left in the film, for the same reasons the hypo is much more quickly and thoroughly eliminated; moreover, the toning bath is able to act with facility and simultaneity upon all parts of the image.

As regards the purely chemical advantages of the collodion over the gelatine paper, it is here enough to state that gelatine has a strong tendency to enter into chemical combination with the soluble salts of silver; such combinations are of imperfectly known character, but frequently produce undesirable results. On the other hand, collodion associated with the silver salt forms a comparatively stable combination, practically entirely free from the objection urged against gelatine, and also in part against albumenised paper.

The experiments and tests which I have applied to the paper used by Mr. Letts—which is known as the Paget collodio-chloride matt paper—were directed to elucidating: (1) With what facility and regularity the toning of prints could be effected; (2) what scale of tonality the paper possessed in comparison with other papers in ordinary use for printing.

The sample I tried printed slightly quicker than the ordinary gelatine papers on the market. In my hands—that is with the negatives that I employed—there was a slight tendency in some cases to discolouration of the high lights, due to the fact that the negatives were not fully suited to the paper.

In the course of the first washing the prints seemed to lose less vigour than usual with gelatino-chloride prints. The toning I found to be notable for its rapidity and for the regularity with which all portions of the print were affected. The sulphocyanide bath used between toning and fixing did not palpably reduce the strength of image, nor did the fixing bath to anything like the extent to which gelatino-chloride prints are so affected.

The procedure is quite simple to understand and perfectly easy to manipulate. The following stock solutions are used:—

Platinum Stock.

Potassium chloro-platinite	15 grains.
Dilute phosphoric acid (B.P.)	3 ounces.
Water *up to*	15 ounces.

Gold Stock.

Gold chloride	15 grains.
Dilute hydrochloric acid (B.P.)	8 drachms.
Water up to	15 ounces.

For use of each twelve parts take—of gold stock, 1; platinum stock, 3; water, 8.

The print is washed for not exceeding five minutes either in running water or by means of several changes, using two dishes.

It is then immersed in the toning bath. Several prints may be manipulated at once, providing care is used. In my own case, on more than one occasion small portions of the collodion chipped off, due to the more or less rough handling inevitable where a number of prints are treated all at once in a small dish. The toning is complete in about two or three minutes, more or less; there is, therefore, small reason for filling a dish with an unmanageable mass of prints.

Having washed the prints for not less than five minutes, they are soaked in a bath consisting of

Sulphocyanide of ammonia	½ ounce,
Water	1 pint,

for three or four minutes. The object of this last is to clear the whites. *Without further washing*, the prints are fixed in

Hyposulphite of soda	3 ounces,
Bicarbonate of soda	small teaspoonful,
Water	1 pint.

About ten minutes is time enough for fixing. If too long in the bath, a reduction of the image takes place.

Finally wash from two to four hours.

In all the above operations I have to caution the photographer not to allow anything to act roughly upon the surface of the print, as there is a distinct liability of the film to suffer abrasion. Thus, a powerful stream of water falling upon a batch of prints may cause pieces of the collodion to chip off, either in consequence of the edge of one print violently striking the face of another or through the heavy impinging of a jet of water.

A considerable merit in the eyes of many is that the paper may be rapidly dried by blotting off and mounted right away, or moderate heat may be applied to hasten the drying.

The second point which I directed attention to, viz., how the tonality of this paper compares with others, I tested by obtaining two prints from the same negative upon the collodion paper, and the other upon platinotype paper, normally developed in the cold bath.

The conclusion I arrive at is, that the collodion paper yields a softer image than does the platinotype. In other words, where a negative is slightly too hard to give a quite satisfactory print with platinotype, the collodion paper will give one just about right. I present for your inspection the two prints above referred to, and taking as a standard common to both the white linen object drying on the wedge, which is the highest light, and which comes white in both prints, and the perfect blackness of the barn door, also fully rendered in the two, you will notice that the scale of high-light tones is somewhat shorter with the collodion than with the platinotype. At the same time I consider the range between half-light and half-shadow is more extended in the collodion than the platinotype; this is a quality to be much commended.

Our worthy Secretary, Mr. H. E. Holland, has undertaken to bring to your notice to-night some trials which he has given to this same paper, using an ordinary sulphocyanide and gold bath; for you must know that, although I have confined myself to the platinum gold toning, the paper is freely amenable to almost any bath, and tones in ordinary baths all the more easily because there is no need, as is necessary in manufacturing gelatine paper, to add any acid as a preservative to the film; hence the paper itself does not tend to acidify the gold bath, which, as you are aware, would *pro ratâ* help retard the toning action of the alkaline solution usually employed.

Before proceeding with my demonstration, I would, in conclusion, add that so far as an examination of the theoretical advantages of collodion compared with gelatine goes, and so far as a practical and careful trial carries me, I am inclined to predict that it is to collodio-chloride paper we must look for the printing medium of the future.

The merits which are likely to carry it into favour are ease of manipulation, certainty of resulting tone, rapidity with which the print can be finished off, and, lastly, the assurance that its permanency is far in advance of the average of gelatino-chloride or albumenised prints.

HECTON MACLEAN, F.G.S.

LABORATORY NOTES AND NOTIONS.

FORMALIN, or formic aldehyde, which is recommended as a convenient and effectual means of rendering gelatine insoluble, bids fair to have a much more extended sphere of usefulness. As an antiseptic, according to a recent number of the *Chemical News*, it is more powerful than a mixture of equivalent parts of boric acid and borax, and prevents decomposition, even in such unstable (and uncertain) compositions as the morning's milk. The addition of only eight and three-quarter grains of a forty per cent. commercial sample of formalin to a gallon of milk is said to have preserved it sweet for a period of six weeks, and a sample, on analysis, gave precisely the same results at the end of that period as at the beginning. Judging from this, it would be a most useful addition to the starch, or whatever other substance is employed as a mountant for photographs in the studio.

BUT in the more purely chemical point of view, formalin will probably become of importance to the photographer. The *Bulletin Chemical Soc., Paris*, has a communication from Messrs. Brichet and Cambier, who have utilised the interaction which takes place between formalin and ammonium chloride in the formation of methylamine hydrochloride. The method is said to give good results and almost a theoretical yield. Two kilogrammes of formalin of forty per cent. and one of ammonium chloride are placed in a flask of three litres' capacity. A vigorous action ensues, and, when it is complete, the mixture is subjected to distillation, when a large quantity of methylal—$HCH(CHO_3)$—which is produced by the condensation of the formaldehyde with methyl alcohol used as the solvent, passes over. The residue is further concentrated by evaporation until the ammonium chloride in excess just begins to separate, when it is allowed to cool and then passed through the filter. The filtrate is almost pure methylamine hydrochloride. The two kilos of formalin used yielded 850 grammes, or about ninety-five per cent. of the theoretical quantity.

ANY simpler and easier method of making the amido compounds is of special interest in photography. Nearly the whole of the recent numerous additions to our developers are members of the NH_2, or amido group of hydrocarbons. The general method of manufacture hitherto employed is of a roundabout and somewhat troublesome character. First, a nitroso compound of the base had to be formed, and this had afterwards to be reduced by nascent hydrogen to NH_2, when followed precipitation of the by-products formed by this operation—often a difficult task.

THE above method of forming methylamine hydrochloride is almost on the same line with that of Curtius, who, a year or two ago, published a new method of obtaining hydrazine, or diamidogen N_2H_4. For this purpose he employed the ammonia addition product of acetic aldehyde $CH_3C\begin{cases} H \\ OH \\ NH_2 \end{cases}$. About 300 grammes of the aldehyde ammonia were dissolved in ice-cold water, and neutralised with cold dilute sulphuric acid. About 40 c. c. more of dilute acid was added, and afterwards a concentrated solution of sodium nitrite in iced water. The liquid at once becomes turbid from the separation of minute yellow globules of a nitroso compound termed paraldimine. This was reduced in the usual way by acetic acid and zinc, with the production of hydrazine sulphate. From this the hydrazine hydrate was easily isolated.

IT is often a matter of surprise to me that our chemists should so persistently explore the vast and intricate regions of the complex carbon compounds in search of new amido compounds to serve as reducers or developers, when basic amidogen or its hydroxide are so easily got at. The immense value of NH_2 as a developer goes without saying, but the more complex the base to which it is attached, the more uncertain and unsatisfactory it is in its use and application. Taking, say, one of the earliest of those introduced, eikonogen, as an example. This, as is well known, is the sodium salt of naphthol-sulphonic acid combined with one or two molecules of NH_2. Its chemical formula is said to be C_{10},H_5HSO_3OH,NH_2Na. Here we have a total atomic weight of 262, of which the actual active ingredient NH_2 only weighs 16. The naphthaline nucleus acts as a carrier to the easily oxidised NH_2, and when this latter is exhausted the whole is thrown away. The proportion of sand in the sugar is here very large, but not exceptionally so. The same holds good with all the aromatic compounds.

What has become of our old friend hydroxylamine? Dealers do not seem to keep it in stock, and I dare say many of them even don't know what it is. Yet those who have used it will remember the beautiful clean development it gave without ever becoming discoloured by use, since it has no carbon base to be precipitated as a stain or dye. Yet it seems to have almost disappeared from the photographer's laboratory. As a developer for collodion emulsion plates it is simply perfection. Unfortunately, with gelatine plates or paper it is found to have a drawback, which probably will account for its disappearance. Reduction of the silver haloid in the film by development is accompanied by oxidation of the developer in precisely equal proportion. The result of oxidation of NH_2 is the production of N_2O, or nitrogen monoxide, which does not combine with the alkali of the developer. With the porous collodion film this is of no consequence, but with the closer and more homogeneous film of gelatine the gas is imprisoned in the film, giving rise to innumerable blisters, and, in case of prolonged development, even loosens the film from the glass altogether. But, knowing the cause, the remedy is easy. In the hydrocarbon amides the N_2O is absorbed by combination with the carbon base. The addition of an easily oxidisable substance to the hydroxylamine solution, such as grape sugar, acts in the same manner, and completely cures the fault.

It might be asked, Where is the benefit if a hydrocarbon has to be used after all? At any rate you have the satisfaction of knowing that, when you are buying an ounce of hydroxylamine, you are buying nearly an ounce of developer, and not an ounce of hydrocarbon with a small amount of developer thrown in. Although I mentioned grape sugar as being a safe cure for the blistering and loosening of the film, it is by no means the only one. I think it was some time in the seventies (I have not the exact date) that Mr. M. Cary Lea contributed a valuable article to The British Journal of Photography on new substances capable of developing the latent image. Amongst others, he pointed out that a solution of cuprous oxide in ammonia, which forms a colourless solution when pure, acted as a powerful reducer, developing an image with the rapidity of pyro itself. Its affinity for oxygen is, however, so strong that it absorbs it from the atmosphere, even whilst dropping from the bottle, as was evidenced by the blue colouration of cupric oxide formed. The addition of gallic acid in a great measure prevented this, and thus a workable developing solution was made. Cuprous oxide Cu_2O is as freely soluble in NH_3 as in ammonia, and forms a very much more stable compound, and contains no organic matter. Here the result of oxidation is first absorbed by the cuprous oxide to form an equally soluble cupric oxide, and when the N_2O molecule is formed, this also readily combines with the copper, and thus no trouble arises from the production of blisters, and the development is very energetic, yet clear. Other combinations will readily suggest themselves to the investigator.

Hydroxylamine NH_2OH, or, as I think it should be written, $N_2H_4(OH)_2$, is usually sold as a hydrochloride or sulphate. Of these, the sulphate is the best when it can be obtained, and requires just enough alkali to be added to combine with the acid and liberate the base, when development will go on. It will compare favourably with any other reducer for staying power and energy. It can be produced cheaply were the demand for it to increase, but even at its present price it is, looking at it from an economical point, quite as cheap as any other reducing agent.

Hydrazin, or its solution in water, is not, I believe, an article of commerce as yet. Possibly the sulphate or hydrochloride might be obtained, but I have not heard of its having been tested as a developer by any of our experimentalists. It is the most powerful reducing agent known to the chemist. It is a fuming liquid, and its hot concentrated solution rapidly attacks glass or indiarubber. Applied to a bromide plate, it instantly reduces the whole of the silver haloid to metal; but, if exceedingly dilute and restrained by a bromide, a vigorous development takes place, with the usual production of N_2O and N. Cuprous oxide dissolves freely in it, and forms a colourless and fairly stable solution, which, if carefully neutralised by acids, gives double salts of cuprous amide. As to its utility as a developer, the quantity I have had is too small to enable me to come to a definite conclusion, but here is a great field that is worthy of exploration.

Cuprous oxide, Cu_2O, is simply and easily made. Take of

Copper sulphate	1 part.
Cream of tartar	1 „
Grape sugar	1½ „
Water	12 parts.

Place in a porcelain boiling basin, and heat until the whole are dissolved, then add

Soda hydrate	1½ part,

and boil until the supernatant fluid is colourless. The precipitated cuprous oxide will appear as a crystalline carmine-coloured powder, and should be washed in several changes of water and kept moist.

E. Banks.

THE NEW PHOTOMETRIC STANDARD.

At last the Board of Trade Committee on Standards for Testing the Illuminating Power of Coal Gas has issued its report. It is, including the appendix, a very interesting document of some eighty pages, which goes thoroughly into the question of the unreliability of candles, and the finding of a substitute that shall be at once reliable, easily reproducible, and not subject to variation.

The report, which is signed by such men as Dr. Odling, Frankland, Vernon Harcourt, Dibdin, begins by saying: "Having been constituted a Committee by the Board of Trade on December 23, 1891, to inquire into and report to them upon the subject of the Standards to be used for Testing the Illuminating Power of Coal Gas, we have the honour to submit to you the following report," and goes on to say: "The method at present in use for measuring the illuminative value of coal gas consists in comparing the light of the gas, when burning from a particular burner at a specified rate, with the light of a sperm candle, burning also at a specified rate, which last is taken as the standard. We have satisfied ourselves, for reasons set forth in the appendix, that the flame of a sperm candle does not furnish a satisfactory standard, by reason of the amount of light which it affords varying over a wide range."

A few of the objections referred to are variations in the method of manufacture, the way a candle is lighted, the length of time it has been burning, the curvature of the wick, the position of the wick towards the photometer disc, the temperature of the air; these are all factors which seriously affect the light-giving value of a candle flame, and would render it an unreliable standard of light, even if the most absolute uniformity could be ensured in the manufacture of candles.

It would appear, then, from this that the standard sperm candle, which is a standard only in name, is now to disappear, and with it a prolific source of error to all who have occasion to use a photometer, for, if the elaborate precautions contained in the referees' instructions to gas examiners are not sufficient to make candles a reliable standard, no one using a candle without these precautions, the chief of which is weighing, can expect to get even an approximation to a correct result; in fact, the error may easily be as high as twenty-five per cent.

The report then goes on to say: "We find that the one-candle-light flame proposed by Mr. Vernon Harcourt as giving a standard light, and commonly known as the Harcourt pentane air-gas flame, when used under the conditions defined, does constitute a very exact standard, capable of being reproduced at any time without variation of illuminative value.'

This one-candle light is made by burning in a special burner, gas prepared as follows: three cubic inches of liquid pentane (pentane is a paraffin boiling at 28° C.) are placed in a gas-holder containing one cubic foot of air; the pentane, which is very volatile, diffuses into the air, and produces a gas which burns with a luminous flame, and with a fixed size of flame it has been found to give a light equal to one standard candle.

This standard light was considered by the Committee to be unsuitable for practical work at the testing stations, and has been retained as a means of producing a light of one-candle power for the verification of the proposed new standard.

This is the invention of Mr. Dibdin, and is well known to photometrists as "Dibdin's ten-candle pentane Argand." It consists of a reservoir filled with pentane forming the bottom of the stand, and over which either coal gas or air is passed from a gas-holder, this pentane carburetting the gas in the same manner as an ether saturator. On the top of the reservoir, supported by a column up which the carburetted gas passes, is fixed an Argand burner of special pattern, the top of the flame being cut off by a screen, which

is fixed at 2·15 inches from the steatite ring forming the top of the burner; and it has been found, by a long series of experiments, that the height of the flame may vary from 2·5 to 4·5 inches without affecting the value of the light emitted by the part of the flame used as the standard, and, to quote the words of the report:—

"We therefore recommend that the pentane air flame furnished by a Dibdin Argand burner, having the form and dimensions set forth in the appendix, and used in the manner there defined, be accepted as giving the light of ten standard candles, and that this flame be authorised and prescribed for official use in testing the illuminating power of the gas supplied by the London gas companies."

The amount of work contained in the appendix is enormous, and any one who knows what photometric work is will appreciate very highly the labours of the Committee.

One very interesting portion is on "the effect of the humidity of the atmosphere upon the amount of light emitted by luminous flames," and the observations show that, in comparing the ten-candle standard with the one-candle pentane air-gas standard, no error is to be apprehended from variations in the degree of humidity of the air in the testing place.

We must now await with patience the report of the Royal Photographic Society Committee which is at present sitting, and sincerely hope that, whatever conclusions they may arrive at, they will place in the hands of photographers as reliable and easily worked a standard as the ten-candle pentane Argand. FRANK B. GRUNDY.

THE HALF-TONE THEORY.

[Process Work.]

HALF-TONE workers have plenty of food for thought just now, for the process is about turned inside out by scientific investigation. Mr. Levy's article in our *Year Book*, together with the very able monograph of Dr. Eder's translated and reprinted in the *Process Photogram*, and the paper of Messrs. Tallent and Dollond at the Royal Photographic Society leave little to be done in solving the problem. It is quite evident that a number of workers have been simultaneously pursuing a course of investigation, and none ought to claim any especial credit for being first in the field. In fact, publication of results of all these investigations has been curiously coincident. There has certainly been more divulged on the "secrets" of half-tone work during the past month or two than ever before. The question naturally occurs, What does it all amount to? Well, to any really practical and intelligent operator who has been "inside" the business during the period half-tone has come into vogue, there is nothing particularly novel in the matter published. The only thing is that scientific data have been furnished to replace rule-of-thumb and guess-work. In this respect the investigation is valuable. Let us summarise the results. Eder proves that the focus of the lens used for half-tone should not be less than 16 inches, and states that the best results are attained with a lens of 24 inches. Of course, half-tones *can* be made with shorter-focus lenses, but there is always an exact "best," and this is what Eder has tried to discover. Half-tone negatives from flat, soft, shadowed originals should be made with large diaphragm apertures, whilst deep-shadowed, full of contrast originals, should be photographed with smaller diaphragm apertures. The correct aperture for a screen of 150 lines to the inch and the best possible distance from the sensitive plate is, approximately, *f*-11 to *f*-13 or *f*-14. In extreme cases, where the lights are required to be more strongly covered, *f*-9 may be used. When it is desired to bring out the shadows better at the cost of the high lights, *f*-15 will be suitable. With coarser screens, such as 120 lines to the inch, apertures of *f*-12 to *f*-14 are the best, which may, with subjects full of contrast, be reduced to *f*-15. It must be borne in mind that these calculations are based on the screen being very close to the plate. This is rather contrary to usual practice. Eder says: "For normal pictures the distance of the lineature should be kept to that which is determined by the thickness of the lineature plus the wires which hold it in its place. For very flat subjects the distance should be increased, for instance, by laying in a strip of four-sheet cardboard between, this being equivalent to thickness of two-thirds millimetre. For wash drawings a card of one-third millimetre is sufficient. But, to a certain extent, the increase of distance of the lineature may be replaced by increasing the ratio aperture of the object, as already described. Yet doubling the diameter of the diaphragm aperture does not double the size of the dot; the latter increases only in the proportion of 3 to 4. Eder further proves the fact that the spaces of the screen act as pinhole lenses, and reproduce the shape of the diaphragm; also that the size of the negative dots is independent of their position on the plate, and that their diameter is equal to the width of a lineature opening increased by the diameter of a minute image of the diaphragm. The dots run into one another with a certain size of diaphragm. The exact size of the dot necessary to overlap can be calculated from the following formula:—

Let $m'n'$ = the diameter of dot in the negative, M N = the diaphragm diameter, $a\,b$ = the size of aperture in the cross-lined screen, δ = the distance between the lineature and plate, then

$$m'n' = ab + \frac{\mathrm{MM}\,\delta}{2f}$$

The remainder of Dr. Eder's paper is devoted to a repetition of Mr Levy's deductions on the influence of diaphragm aperture, as published in the *Process Work Year-Book*. Dr. Eder says: "I am convinced that the statements of this expert are as exhaustive as they are satisfactory, and I use his illustrations and arguments herewith." In France too the subject of the half-tone theory seems to have been receiving consideration. We have received a pamphlet, dated April 1, 1895, by M. Ch. Féry, entitled, *Sur les Réseaux quadrillés employés en Photogravure*. The writer thinks that the influence of diffraction is a negligeable quantity, and that, if we consider the diaphragm as a luminous source, the elementary theory of shadows will explain all the peculiarities observed. The phenomenon is, however, complicated by the action known as irradiation, the molecules of silver in the film becoming luminous sources and acting on one another. On the whole, M. Féry thinks that the phenomena of irradiation, together with variations of the luminous intensity of the penumbra in different parts of the photographic image, explain the effects of the encroachment of the light on the parts protected by the shadows of the black lines. The equality of the triangles formed by the rays emanating from the edges of the diaphragm, and crossing the edges of the square openings of the screen, easily permits a formula to be prepared showing the necessary conditions. Let e equal the distance of the screen from the sensitive plate, a the thickness of the lines of the screen, f the focus of the lens, and d the diameter of the diaphragm. Then

$$e = \frac{af}{3d}$$

These equations relating to the theory of half-tone appeal perhaps only to a few workers, and it is to be regretted that, for the benefit of the majority, the terms cannot be put in a more popularly understandable manner.

PHOTOGRAPHING LIGHTNING.

Journal of the Society of Amateur Photographers of New York.]

ONE day about thirteen years ago, while looking at a large painting, representing a storm at sea, I noted, extending in a diagonal direction across the canvas, an awkward angular, zigzag line, which was supposed to depict a flash of lightning. Many a time had I watched a display of Jovian fireworks, but had never observed a discharge of that kind. Thinking, perhaps, that the artist had painted, not from nature, but the brain of a brother artist, I decided to see whether the matter might be settled by means of the camera.

No one, to my knowledge, had been so foolish as to sally forth during a thunder-storm equipped with a photographic outfit. Nothing was caught at the first few attempts but a series of bad colds; but at last, about half past ten on the night of September 2, 1882, I believe, for the first time, Jove was induced to write his autograph on a photographic plate, in the form of a wavy line. Not until three years later—August 5, 1885—did I succeed in getting a better photograph. This time the camerist was arrayed in an old rubber coat, the tripod planted on the roof of his house, and he had waited patiently until half past ten before the storm arrived. It came so quickly and with such fury that it took all the photographer's strength to keep the camera and himself from being blown into the street. There was no doubt this time as to the character of the discharge. A wavy line with branches. No indication of zigzag.

Sir Frederick Leighton exhibited at the World's Fair a painting where, perhaps, for the first time an artist has given lightning its true form.

It was about this time that I learned that Nasmyth of Steam Hammer fame had read a paper before the British Association, in 1856, calling attention to the erroneous character of a lightning discharge as drawn by artists, a zigzag dovetailed line, when the true and natural form of a primitive flash appears to be more correctly represented by an intensely crooked line, sometimes having branches. His paper was accompanied by two sketches which I have roughly copied. My photographs strongly bear out Nasmyth's assertions. At no time during the last twelve years have I succeeded in obtaining the image of so-called "zigzag" lightning.

Perhaps it will interest you at this point to note how artists—widely remote as to time and place—have treated the handiwork of Jupiter. On the handguard of an ancient Japanese sword, in the Boston Museum, three forms of lightning were shown: a zigzag, a thunderbolt, and a branched line.

In the many paintings by European artists, so far as I can learn, previous to 1882, the conventional zigzag form of lightning has always been adopted.

On the face of an Egyptian coin struck off before the time of Moses we find the image of Jupiter floating through the night on wings of flame, bent on a mission of destruction. Number two, with fiery head and hands, is soaring above the earth, seeking whom he might destroy. This

example was discovered by a traveller in the seventeenth century. It was carved on the rocks in Northern Siberia. The third, fourth and fifth figures were found two hundred years ago, painted on the face of a cliff on the shore of Lake Superior, by an artist of the O-jib-wa tribe. These Indians have a tradition to the effect that, many, many moons ago their ancestors were driven from a very cold climate to the land of corn and corn juice. Many anthropologists believe that this cold country was Siberia. Perhaps the study of thunder godology would add another ray to the beam of evidence reaching from the orient to the occident.

Among the Dakota Indians Jupiter reigns supreme. While looking through *Schoolcraft's Indian Tribes*, a work published by the Government, I found a number of sketches made by a clever little Indian girl, illustrating the Thunder God's many methods of distilling the electric fluid, sometimes known as Jersey lightning. In one case he draws it from above, fashions it into a large thunderbolt, and shoots it across the prairie. Another time, he gathers his fire from below, moulds it into a white hot ball, sticks it on the end of a rod, whirls it around his head, and hurls the flaming sphere at his immortal enemy, the Forest God. Then, again, he stands on the middle world; reaches up and shakes thunder out of the upper world; and then, working himself into a fine frenzy, smites the lower world with brands of fire.

It is evident that the Indian artist had observed what are known as multiple or poly discharges. They are here shown in this triple whip-lash, all having the same outline, exactly as I caught them on the prairie of North Dakota three years ago. This shows that the poor, unlettered red man can give the members of the Royal Academy lessons in drawing lightning flashes.

The Forest God, after his long winter sleep, came out of the ground, and, from his perch amid the branches of the highest tree, watched the buds unfold. At sundown the birds flew past in great numbers, and warned their friend, the Forest God, of the coming of the Thunder God. Out of a cloud Jove suddenly sprang, and hurled a hissing dart at the tree, barely missing the God of the Forest, who quickly flung at Jove another dart. This made the Thunder God mad as thunder itself, and he dashed through the night, bent on killing his enemy, who nimbly slid down the sap of the tree, and hid among the roots. Jove followed at such fearful speed that before he could stop himself, or make a turn, he fell headlong in a subterranean stream and was drowned. The air was now full of angry Thunder Gods, who swore in deepest tones that rolled around the world to avenge the death of their brother. They all joined forces. Number one snatched a red hot ember from the clouds, blew it white hot and passed it to his neighbour, who blew it hotter yet, and so travelling it reached the last God in the line in the shape of a molten thunderbolt, which was hurled at the forest doing much damage. But the Forest God was a sly fellow. From his safe hiding-place he gathered a large number of flying thunderbolts and waited until his enemies were weary of their labour; then suddenly, without warning, shot from the twig of every tree a host of tiny incandescent needles, which completely destroyed the Gods of Thunder.

Upon obtaining a true photograph of lightning, I was desirous of comparing its image with that of the artificial spark produced by an influence electrical machine. Professor Goodspeed, of the University of Pennsylvania, kindly placed a large Holtz machine at my disposal, and assisted me in a series of photo-electric experiments, extending over a period of three years.

It was found that there is some analogy between a lightning discharge and a spark passing between the terminals of a Holtz machine, both having the same crooked character, with absence of zigzag. First a short spark. Then the distance between the terminals increased, and several sparks allowed to pass; and, lastly, the addition of a number of Leyden jars, and the production of a short, thick, powerful spark, a veritable grandchild of Jove.

You all know that, when a sheet of paper is placed upon the poles of a magnet and iron filings scattered over its surface, the particles of metal form a peculiar pattern, depending upon the position and polarity of the magnets. Take, for instance, the north and south poles of a magnet placed a few inches apart. The scattered filings will give you a series of curves gradually widening at the middle, and running to a point at both ends. The same effect may be produced, and these "lines of force" imitated, by placing a photographic plate between the two poles of a Holt machine and allowing a "brush discharge" to pass over the surface.

If the end of a bar magnet is placed under a sheet of paper, and iron filings scattered upon its surface, the lines of force will, from a central core, radiate in all directions.

If a photographic plate is brought near the end of one of the poles of a Holtz machine, placed at right angles to it, the stream of electric energy will exactly duplicate the electric effect.

Although we had not used a camera in these experiments, we were successful in making the electrical machine yield us a portrait taken from the surface of a silver dollar. This was accomplished by placing the coin upon the surface of the plate, and allowing a number of sparks to strike it.

Upon placing a round paper weight in the middle of a photographic plate, and allowing the electric brush to play upon it, we obtain an effect very similar to the photograph of the sun's corona taken during a total eclipse. It has been suggested that this corona really consists of an electric halo. This experiment, perhaps, tends to strengthen that theory.

Jove has many moods, and flings his darts in various ways. On May 28, 1888, during a fearful storm, the whole sky appeared to burst into flame, and from the lip of a red-hot crucible came a molten stream, which struck and fired a barn two miles away. At another time a triple streak flew across the sky, made a sudden turn, joined forces with other meandering flashes, and shot downward in the form of a thick band half hidden among the clouds.

In order to gain a clear view of the storm, I had walked about a mile from home, and stood on a pile of stones in a very lonely spot near a graveyard. It was the hour of midnight, when ghosts are supposed to trip the light fantastic toe. The lightning was extremely vivid and the rain very wet. An old felt hat, drawn well down, shielded my eyes, and an old rubber coat protected the Kodak from the rain. Hearing footsteps approaching, I looked in that direction, when a brilliant flash of lightning revealed a face not a dozen steps from mine—a milk-white face, with staring eyes and a cavernous mouth. It looked as ferocious as possible, only needing horns to complete the illusion. Then it became very dark, and I heard some one doing a lively quick step along the turnpike. That locality has a bad name to this day.

When, in 1887, I showed this photograph at the Franklin Institute, attention was called to its branched character, and the opinion given that the so-called "tree marks" found on the bodies of persons struck by lightning, hitherto supposed to be images of trees in the neighbourhood, were really due to the spark itself, which took this course over the surface of the skin. In order to demonstrate the truth of this theory, a spark was allowed to fall directly upon the surface of a photographic plate, made slightly damp by breathing upon it; upon developing the plate, we obtained a perfect "tree mark." I mention this now because an English scientist has just discovered this fact, and seems inclined to steal our thunder, so to speak. (By the way, I saw one of my copyrighted balloon photographs reproduced in an English magazine not long ago with this title, "Balloon View taken from a Military Balloon at Aldershot by the Royal Engineers.")

Although observing thunderstorms very closely during many years, I have never yet been able to see the beginning or ending of a flash of lightning; but the glass eye of the camera has often caught such a record. Here, for example, we see the discharge has split, and we can follow the twigs to the very tips. This illustrates what was meant by the Dakota Indians. The Forest God appears to be throwing upward tiny darts, weakening and destroying the striking power of the Thunder God.

The service of the lightning rod is not so much to collect electricity, and conduct it safely to the ground, as to discharge from its upper extremity electrical energy of the opposite kind to that in the atmosphere above it, thus tending to bring about an electrical balance, and weaken or destroy the power of the storm. Thus every tree in the region of a thunderstorm becomes a many-pointed lightning rod. Here is a flash of lightning that started out to reach the earth, but turned backward in its flight upon nearing the forest below.

On June 11, 1890, I was fortunate in capturing a rare prize—a vertical sinuous line, its lower extremity lost behind a clump of trees about a mile away. The length of the spark was at least two miles. From the main stem extended rose-tinted branches, of which fact I made a note before the plate was developed. In the photograph the non-actinic rose-coloured branches are shown as dark lines against the bright glare thrown by the main discharge. This was not a "reversal of the image" caused by a second flash immediately following the first. Ten minutes later, from the same point of view, I caught a horizontal flash extending clear across the sky. The length of this spark was about four miles. With few exceptions, the photographs of lightning show an increased thickness along the line of light. This effect is real, and not lenticular distortion. What causes this is yet a puzzle.

On the night of May 15, 1892, at about eleven o'clock, there came from the south a most peculiar storm. Instead of the usual single discharge, or a main stem with branches, there suddenly appeared in the sky a brilliant white spot, which seemed to explode, and tongues of flame shot out in all directions, each terminating in a white spot, which in turn exploded, and threw out radial arms. Each of the spokes of this strange wheel was split its entire length. This remarkable feature of the storm was not confined to a single display. I saw and caught that night several such images. On this occasion I observed for the first time what is known as a thunderbolt. From the centre of one of the radial discharges a large spark shot through the sky, looking exactly like a sky-rocket, having a short tail. This, I think, was due to the collision of two lightning flashes, and the subsequent rebound of molten matter, clearly shown in this photograph, as well as the stratified radial arms above referred to.

When, several years ago, I showed Mr. Ives the photograph now on the screen, he remarked the similarity between the course of the discharge and heat cracks in glass, and suggested that; as heat, light, and electricity are but three links of the same chain, perhaps that which we call lightning is really a sudden fracture of the ether. Acting upon this hint, I took at random three sheets of glass, and held them one after another in the flame of a candle until they cracked; then, slightly separating the fractured pieces, the glass was smoked, and mounted as a lantern slide. In this way I manufactured three forms of lightning. First a horizontal

discharge, very similar to the one shown on the screen not long ago, having the same wavy motion extending its entire length. Next I obtained a good example of forked lightning, and lastly a close imitation of the real article, which will be shown for comparison.

This fractured ether theory has now many earnest advocates, and this experiment will, I hope, at least untie one knot in this tangled skein of controversy as to "what is lightning."

In 1876 the late Gaston Plante called attention to a new form of lightning which he had observed during a thunderstorm from a point on the outskirts of Paris. In his report he stated that the storm made its appearance at about six o'clock in the morning. A vast mist darkened the sky, which gave birth to a series of lightning discharges of great length and of varied forms; one of these bent on itself and formed a figure 8. These discharges seemed to be composed of brilliant points. A remarkable flash shot from the cloud to the earth in the shape of a figure 8. This he named "Rosary," or "Beaded" lightning.

The description applies exactly to a storm which occurred at midnight on May 10, 1890, when I noted a large number of odd-shaped discharges, some in the form of a figure 8, others having the shape of a letter S, all having a series of brilliant points along the line of the discharge.

This is the track of a thunderbolt: A ball of fire rotating rapidly, and moving slowly through space. Not flung from the sky to the earth, but thrown from the ground into the sky, and having formed a peculiar curve the molten sphere fell earthward again. According to *La Nature*, this is the first authentic record of the path of a thunderbolt.

As I have often pointed out, when lightning has once opened a path in space, this seems to be the line of least resistance, along which at short intervals oscillate other discharges. If the observer is stationary, the multiple flash will seem to be a single discharge; but, if the eye be moved across the line of light, its multiple character will be revealed. This conducting path may be moved by the wind, in which case a fixed camera will record a number of parallel discharges. Here is such a case.

While an east-bound train was nearing Chicago one August night in 1892, an amateur photographer of the Windy City took from the car window a photograph clearly illustrating the multiplicity of the lightning flash. The train was running at full speed, and the oscillation of the camera at right angles to the discharge brought about this bunch of parallel lines. I have often noted bats and birds flying across the path of what appeared to be a single flash of lightning of rather long duration, which has revealed as many as a dozen different images showing distinct, clear-cut wing movements. I am quite sure that, if the train had been stationary at the time of this discharge, the camera would have caught a single horizontal image of lightning.

The same night, August 11, 1892, another amateur photographer from a quaint and quiet Quaker city stood on the platform of a rapidly running train on the prairie of North Dakota. He and his camera had been out in many a storm at all hours of the night in quest of stray thunderbolts, but this was really the first time in his life that he had gazed upon a thunderstorm. The lightning was so near that he could almost reach out and touch it, not simply strings or ropes, but broad ribbons of flame.

In the opinion of Tesla, Thompson, and Young, the broadening of the image in the case of the slide now shown is due to camera movement during the discharge. At the time it occurred, I noticed distinctly its ribbon character, and saw outlined against the sky images of telegraph poles, which the camera has caught, as well as the clear-cut photographs of the railroad ties. If the broadening of the flash is due to camera movement, we should also have broad images of the telegraph poles and railroad ties. I am inclined to think that two parallel discharges occurred at the same instant, and the electric energy oscillated horizontally between them, giving the effect of the aurora borealis.

Now that the camera has revealed such a wonderful variety of lightning discharges, which always appear the same to the eye as to the lens, it behoves the artist who would truthfully represent a thunderstorm to study nature, and not the work of a brother artist, and never again should an awkward angular zigzag be made to stand for the graceful autograph of Jove.

W. N. Jennings.

ANNALS OF THE OLD SOUTH LONDON PHOTOGRAPHIC SOCIETY.

[South London Photographic Society.]

The pleasure of seeing the last Exhibition of the South London Society revived in my mind so many recollections of the early days of the first South London Society, that I venture to communicate to your Hon. Secretary that, if he thought it would be of interest to the members, I should be happy to place before you some of the early work done in the sixties and seventies.

I shall not trouble you with a long paper, but propose to introduce the subject to you in a manner that will allow of a conversational and inquiring tone pervading the meeting, subject to your Chairman's pleasure.

The Exhibition now being held at the Imperial Institute is suggestive of reference to early work and workers, and my remarks may add a zest to the subject, and, I hope, encourage young photographers to refer to the writings and early examples of the period I have alluded to.

The formation of photographic societies, of which the first South London was one of the earliest, was largely encouraged by the appeal of Lord Rosse and Sir C. Eastlake to H. F. Talbot to allow his patent for producing "Photographs on Paper" to be altered and relaxed, and this he did, only reserving the portraiture right. Hence artists and amateurs were invited to emulation and investigation of the art of photography, and societies were formed to encourage a free interchange of thought and discovery; this was in 1852. The scientific, the artistic, and the recreative were all free to the discovery, and very rapid strides were soon apparent. "One touch of nature makes the whole world kin," and the power of reproducing nature in the truthfulness and charm of photography speedily seized upon thousands in every part of the world.

Now, a few words upon the authorities of those days will not be out of place in as brief a manner as is compatible with the time at our disposal. I will refer to the works of Professor Robert Hunt and to T. F. Hardwich; they were the foremost guides we had in the fifties, and modern workers, and amateurs in particular, would do well to not only read their books, but, if possible, to add them to their library; the why and wherefore of many of our modern methods of working will be made plain, because it must be remembered that, though collodion has largely been abandoned, it is only as a vehicle for holding the sensitive salts of silver that were used then, and are used still, but in another medium in our more modern methods of working.

I will now venture to approach the subject of the evening, viz., the *Early Work of the South London Photographic Society*, though it will necessarily be of a brief character. The Society was formed in May, 1859; the President was the Rev. F. F. Statham. At the formation of the Society there were present Mr. G. Shadbolt, Mr. Ackland, Mr. Fitch, Mr. Alfred H. Wall, and Mr. F. Howard. We soon got to work, holding our meetings at the Walworth Literary Institution in Carter-street.

Mr. Alfred Wall was our first Hon. Secretary, and most energetic he was with pen and pencil; a reference to the early volume of the photographic journals will show how frequent were his contributions principally upon art in relation to the camera; we were by no means a mutual admiration society and many were the arguments we had upon this and other kindred questions.

One of our first papers, I recollect, was art and correct drawing as illustrated by photography. We had no hesitation in telling the artist: "My dear sir, that is not a cow! and your trees are not what nature represents; look at a photograph, you have much to learn——."

We started at once upon the system of giving to each member a copy of The British Journal of Photography, and made that our official organ; it was then published fortnightly at Liverpool, also presentation prints by good workers; this was done to keep all the members in touch with the latest information, and was a great help to the Committee working the Society, we speedily enlisted in our ranks some of the ablest men of the day both professional and amateur; amongst the amateurs we had Messrs. Hannaford, Henry Cooper, Sebastian Davis, J. Homersham, and many others amongst the professional photographers, Messrs. Blanchard Hughes, York, Harman, Foxlee, Henderson, How, and willing helpers in considerable force. After a time, we migrated to the City of London College, and afterwards to the Society of Arts; this severance from the locality of South London became a necessity, as we were largely the mouthpiece for many years of the London photographers from all parts; whether we were more social or energetic I cannot say, but we owed a great deal to our worthy President, the late Rev. F. F. Statham, who never hardly missed presiding at our monthly meetings, and was so genial to all comers when in the chair that we always had a large gathering. The Photographic Society of Great Britain, at that time the Photographic Society of London, the South, and North London were the only active societies for many years in London. The North London subsided, as did also the Blackheath. I had the pleasure of forming a small society of amateurs known as the Amateur Photographic Field Club in 1860, which, I am pleased to say, still exists.

In our early days, viz., from 1858 to the end of the sixties, we worked hard upon the various dry processes for landscape work, examples I have brought down for inspection. Stereoscopic work was also very popular, but was marred by the efforts to produce ideal subjects and effects.

The principal methods of working, besides wet-collodion, were the dry processes of the albumen type, such as the Fothergill and the collodio-albumen) the tannin, gum gallic, and others, all of which were, when carefully worked, capable of producing fine results.

I will now submit for your inspection, as likely to promote some inquiries and discussion, specimens of various processes by myself and other workers in wet-collodion and dry-collodion processes, viz., collodio-albumen, Fothergill, and gum gallic, all of which I shall be happy to answer any inquiries upon.

As a traveller looks backward over the scene of his travels when he has reached an elevation, a little reflection and a pause for reference and examination may not be unpardonable. It is in that spirit I offer my few remarks this evening. Personally, I have always followed photography as a recreation, not allowing it to be too exacting or wearing, and have now for some years resided remote from Society meetings. The names of Russell, Ackland, Mudd, Manners Gordon, Cooper, with many others, Sebastian Davis, and Homersham occur to me, with examples I have in my folios. Our presentation prints were an important feature every year, and we were able to give our members examples of the best workers and the various processes.

One of the results of the activity of the Society was the Exhibition held at the Crystal Palace in 1862. When the space awarded for photography by the Commissioners of the International Exhibition was considered inadequate, an active Committee was formed of the South London Society, and, with the co-operation of the managers of the Crystal Palace, an Exhibition of considerable size and great merit was got together. Experimenters amongst our members were numerous and active. In the preparation of collodions I may mention Sebastian Davis, Valentine Blanchard, Hannaford, Henry Cooper, W. Brooks, and W. England. The preparation of sensitive plates by various methods was a great feature of the Society.

We all had special dark rooms and several small studios for portraiture and copying. That important feature of the working amateur, the nitrate bath, was a constant care, a joy when working well, the negatives things of beauty. As a recreation, I really do not think any pleasure in connexion with photography equalled the preparation and development of a good wet-collodion negative.

By thus keeping alive the interest in photography, it is not denied we had the most energetic band of workers ready to investigate the merits and failings of the gelatine process when it came to the point; both professional and amateur members were most diligent. No doubt, a somewhat secretive tone crept in, but, when it is considered that capital to a considerable amount was necessary to start a dry-plate manufactory, it is not to be wondered at. What has been, and still is, a source of surprise to myself is that so few professional photographers attempt making their own plates. On a small scale plates can be made with great ease and certainty. For many years I and many amateur friends made our own with great satisfaction.

However, our members were quite alive to the great advantage of the new vehicle, gelatine, and all aided to perfect the process. It would be invidious to mention names, many of whom are now working prominently in the plate-making business. Though certainly not early work, a specimen of early gelatine experiments may not be uninteresting. Abney's process of preparing bromide of silver, and, after washing, adding to gelatine, was, in my hands, successful.

The later days of the Society and its proceedings are, doubtless, within the recollection of many members of this Society. Many, no doubt, recollect the interesting lantern evenings we continued for so many years, having been the first Society to show the capabilities of photography for that class of work twenty years ago. In a communication to The British Journal Photographic Almanac I made in 1875 on this subject, entitled, *An Undeveloped Field of Photographic Work*, I called attention to the value of collecting and making slides. I little thought it would assume the magnitude it has, but I am sure no one regrets his time devoted to this popular and useful study.

Also stereo transparencies, of which I have a considerable collection, are a most satisfactory method of recording and collecting amateur work.

I have not brought any glass examples, as they are difficult to pack and travel with, and it is a wide subject and worthy of special attention. I see your Hon. Secretary is to take up this subject at an early date, and I cordially commend it to your attention. Frank Howard.

SUMMER EXCURSION OF THE N.A.P.P.

Specially favoured by brilliant weather throughout, and located in one of the most lovely districts in the kingdom (Matlock), the Association held its *first* annual summer excursion. Amongst those present were the President for the current year, W. Barry, Hull; ex-President T. Fall, London; Warwick Brookes, Manchester; T. Birtles, Warrington; Boak, sen., Driffield; J. E. Eddison, Leeds and Burnley; T. Illingworth, Bradford; T. N. Langton, Sheffield; F. Whaley, Doncaster; G. V. Yates, Sheffield; A. Broadhead, Leeds; J. H. Bailey, Ripon; Franz Klin; and, by special invitation, the ladies of the N.A.P.P. were well represented.

Headquarters were at Royal Hotel, one of the most palatial hostelries of the Peak District. Mr. Tyack, the proprietor, courteously placed all his resources at the disposal of the Association — a special reception-room for use of members; the large drawing-room, with piano and music, for restful evenings after the day's excursion; smoke-room; billiard-room; *salle-à-manger*, for needful and agreeable "restoration" of the "inner man;" last, not least, the large swimming bath, where several of the visitors were to be found executing feats of skill and dexterity in the early summer mornings, and, in the evening, refreshing themselves after the day's excursion. The bath is supplied by a spring of water (sixty-eight degrees) from the hills above hotel, passing through in a continuous stream of fresh-flowing, health-giving water. Mr. Tyack is also proprietor of the New Bath Hotel, and others at Bakewell, Buxton, &c.

Mr. Dawes, manager of the Pavilion gardens and pleasure grounds, upon the hills above the Royal, courteously invited the members to his delightful domain of sixteen acres of gardens, arranged with the utmost care and skill, from which delightful views of hills and valley are obtained. Tennis courts, concert hall (crystal palace) 90 ft. by 60 ft., two annexes, 60 × 24, for promenade. Mr. Downes kindly arranged for his band to play much longer in the evenings for the convenience of the members of the N.A.P.P. who had been away on district excursions.

The "coaching" arrangements were personally superintended by the well-known Mr. H. Briddon, who exercised all possible care in providing for the comfort and convenience of the members.

Letters of apology, regretting unavoidable absence, were received from H. J. Whittock (Birmingham), Harold Baker (Birmingham), who suggested the excursion, T. Bromwich (Kidderminster), Hon. Secretary, J. Crosby (Rotherham), Ch. Laforse (Ilfracombe)—absent through indisposition—and others.

One brother of the camera was obliged, by marital affection, to remain in his domestic circle, his wife refusing to allow him to journey so far with the newly arrived "little stranger."

The first day was devoted to the baronial Haddon Hall—property of the Duke of Rutland—one of the most unique specimens of mediæval residences in the kingdom, is in a splendid state of preservation, and is lovingly cared for by its owner.

Mr. Bradbury's expressive *résumé* tells the tale: "It was not disturbed by the Wars of the Roses, and when nearly all the great houses of Derbyshire (its near neighbour Chatsworth even) were garrisoned for king or Cromwell, happy Haddon was left to dispense hospitality. In appearance Haddon, with its massive battlemented walls, suggests a military stronghold, but the bow was never pulled here for the chase, or the matchlock fired only to furnish the larder. Thousands of 'shots' have been fired against its towers, and turrets, and terraces—by photographers, and it has often been besieged by picnic parties. Romance and revelry, the Yule log and the wassail bowl, the minstrels' gallery, and the hawking expedition are the merry *memorabilia* of this mansion of the Middle Ages."

It is a most delightfully primitive old-world place, from the time you commence the ascent of the rocky, rugged incline leading to the gateway of the Norman tower until you leave the precincts by the postern door in the outer wall, with its seventy odd stone steps. Small "nooky" corners, mysterious recesses (some behind panelling), huge pewter plates and dishes, formerly used for holding the viands for "lords and ladies gay."

The most interesting specimen of feudal life is the banqueting hall. At the farthest point from the entrance was the daïs, for the host and chief guests; lower in the hall were congregated those who "sat below the salt."

The iron ring fastened to the oak "screen," whereto were fastened the topers who shirked their liquor, and down whose sleeve were poured the rejected drops. Above was the "minstrels' gallery," where music was "discoursed" for the delectation of cavalier and dame.

The glorious long gallery or ball-room, panelled in oaken carvings and planked with a flooring level as a billiard table, ready for the dancer's foot even now.

Outside the iron-barred door, down into the great "yew garden" by Dorothy Vernon's steps, whereby she eloped with John Manners—one of the love stories of the world—on to the terrace by the façade, with ivied casements and oriel windows, depicted by artists from all parts of the civilised world.

The Norman chapel, with high, cage-like pews, glass windows over 400 years old, a quaint Norman font and cover.

The ruling passion broke loose here, and some groups were taken by the more industrious members of the National Association of Professional Photographers.

An ascent to the summit of the Eagle Tower, by rugged and well-worn small steps, gives a lovely view of the surrounding country.

Those with cool heads and steady nerves climb up the narrow stone steps, with an iron rail on one side and *nothing* on the other, reaching the flagstaff.

The first visit to Haddon is an event in a life; one departs from it with regret and a desire to spend a long summer day there. At night your dreams are of Dorothy Vernon, the ball-room full of gaily dressed folks and serving men, jester, porter, and archer; jack boots, leathern jerkins, and leathern bottles; venison and huge pasties; pewter dishes, a load in themselves for a man to carry; the river Wye, narrow bridges, the postern gate, and the warder's horn arousing you from slumbers, you wake to find it is the second day of the excursion.

Mr. Barry (President) was the guide to Dovedale, he having kindly gone over the ground arranged for the excursion recently. He is as skilful on the iron wheel as he is with the camera.

The route from Matlock winds by the exquisite wood and crag-lined way known as Via Gellia, from the Gell family, who constructed this lovely passage through the ravine, woods, and tors fantastic. Songbirds, ferns, and wild flowers abound; waterfalls and winding river keep one company.

At the Pig of Lead Inn begins Bonsall Dale. A conical hill, Thorpe Cloud (900 ft.), green to the top, is seen as you near the quaint ivy-clad church in Thorpe village, with its quaint village well, and crowds of merry-faced school-children, who are not "bettered," we fear, by being taught to scramble in the road for the coppers thrown about by the passing tourists.

At the Peveril Hotel, a picturesque house in the Tudor style, an excellent lunch, well catered, well served, was acceptable, and the active presence of the landlord's dainty daughter a notable and welcome feature in the programme.

A walk over rising ground pasture-land, with herds of cattle dotted

about, a descent into the valley under Thorpe Cloud, and we suddenly enter into the beauties of Dovedale, wood and water, crag and peak.

We are now in the land of of Isaac Walton, and come upon some fishermen at work in the craft of the gentle Isaac.

Mr. Bradbury says: "We come at a step into a narrow and rocky valley, with a river so pellucid that it follows its zig-zag course in waves of watery light. On either side abruptly rise fantastic limestone crags, that mock, in their castellated shapes, their mimicry of minaret and spire, turret and tower, pinnacle and bastion, garth and obelisk, vault and cupola, the most powerful architecture of man. These precipices are softened with mosses and lichens, shrubs and wild flowers, and project like alabaster shafts from curving backgrounds of hanging wood, thickets of yew and ash, fir and larch, oak and sycamore, hawthorn and hazel. The Dove wanders in a winsome way amid this bold and beautiful rock-grouping, now foaming in a series of little cascades, made by the outcrop of the limestone strata composing the river's bed, anon resting in reflective pool, or circling in delightful little eddies."

Groups were taken, and, to vary the matter, the members and some ladies mounted the fiery Arab steeds usually found at such places of holiday resort—yclept donkeys.

We look forward with pleasurable anticipation to receiving a proof of this unwonted spectacle, wherein some of the "grey and reverend signors" in the photographic world are to be seen "outside" their steeds.

After clambering up the rugged mountain road to secure a special view with some figures, the latter were found to consist of three Salvation Army lasses, one the proud and smiling mother of what the ladies of the N.A.P.P. declared to be a *lovely baby*.

The President did not dispute this declaration, while ex-President Fall amused the Salvationists by one of his Yorkshire "baby stories." This genial gentleman has a large stock of stories to fit all possible events and occasions.

On the homoward route there was time to note the High Peak Railway, which was passed under an arch, at the summit of a mountain road, by the Jug and Glass Inn.

The Whitworth Hospital and the Whitworth Institute, built and endowed by the late Sir Joseph Whitworth, a native of Darby Dale, Stancliffe Hall, his residence. The Institute contains library, reading-room, lecture-hall, billiard-room, baths, recreation grounds, lake—a perfect people's palace. The splendid swimming baths are open to strangers for a small fee.

The Darby yew, in churchyard, is some 2000 years old.

The third day was devoted to Chatsworth. His Grace the Duke of Devonshire had written, courteously explaining his absence. It was said the Duke was fulfilling social engagements in London at the date of the meetings. However, special facilities were afforded to the members of the N.A.P.P.

The private drive, through the park, was permitted to be used, and formed a delightful treat, on leaving the "main road."

The N.A.P.P. party were specially and privately conducted over the mansion as if they were private guests of His Grace.

The attendant who received the members was specially allotted to their service by one of the Duke's officials, who had been instructed accordingly, and the lady in question was most patient and obliging. allowing the visitors plenty of time to examine the rich art treasures which were to be seen on all sides, giving full explanation to all inquiries.

The private rooms, which are not included in the usual state rooms accessible to visitors, were open on this occasion to the N.A.P.P. The decorations are white and gold.

Further, the fountains, in all parts of the grounds, were set playing, and this special concession was fully appreciated.

Doubtless, if the Duke had been at home, the reception would have been of a still more kindly and courteous description.

There is no space here to even name the principal glories of Chatsworth House.

The Secretary (D. J. O'Neill) who has made a special study of the various schools of painting and sculpture, was a useful additional guide to the art treasures of the Cavendish family.

The pictures included the great names from Van Eyck to Landseer. Michael Angelo, Raffaelle, Leonardo da Vinci, Hans Holbein, Albert Dürer, Rubens, Rembrandt, Titian, Claude, Salvator Rosa, Correggio, &c.

Notably, some of the most choice pictures were in the private apartments now so courteously open to the N.A.P.P. Landseer's *Laying Down the Law*, *Bolton Abbey in the Olden Time*, the *Beautiful Duchess, and her Laughing Danghter*, *Bluff King Hal*, *the Courtly First Charles*, *Mary Queen of Scots*, and others by the great masters, whose works were as fresh and free from times wreckage, as the Landseers of yesterday.

The wondrous sculpture gallery, one of the art temples of the world, contains the greatest works of Canova, Thorwaldsen, Schadow, Westmacott, Tenerani, Finelli, and Gibson.

The libraries are amongst the most famous and exquisitely appointed in the world. One of the doors is painted to resemble volumes of books.

Tom Hood supplied the titles of these droll creations, such as, *Lamb on the Death of Wolfe*, *Cursory Remarks on Swearing*, *John Knox at Death's Door*, *Barrow on the Common Weal*, &c.

The grounds in the "Palace of the Peak," with their Italian gardens, fountains, grand cascade, English garden, classic statues, busts, were visited.

The water power is produced by a lake, 600 feet above, which drains the mountains and moors around it. The water temple, the side fountains, the immense length of stone staircase enveloped with water, reminded one of the glories of St. Cloud before the Franco-Prussian War, while the framework of the picture, in woodland and park far excels the French palatial display.

The "Emperor" fountain throws a single jet 300 feet high, with 10,000 gallons of water per minute.

The "Great Conservatory," the largest in the world, is the prototype of the great Exhibition, Crystal Palace, 1851. Sir Joseph Paxton, designer of the 1851 building, having been in the service of the Duke of Devonshire. It contains 70,000 square feet of glass, with a rare collection of choice trees and plants, which were referred to by the head gardener in a most lucid and agreeable manner, which enabled those not learned in horticulture to understand and appreciate.

Mr. Hilder, who is the proprietor of the very excellent local photographic depot in Matlock, afforded numerous facilities and courtesies to the N.A.P.P. on this occasion, and he had the advantage of being personally known to most of the members. He is also a skilled musician and—*mirabile dictu !*—"Honorary Conductor" of the "Matlock Band," which comprises several skilled executants dressed in a smart "military" uniform; located in a capital "band pavilion," they discoursed "concord of sweet sounds," while our ex-photographer wielded the bâton.

The riverside promenade and gardens provided an agreeable change for the tourists after the evening tea. Music, recitations, character stories, with the agreeable adjunct of the society of the ladies in the drawing-room, while others engaged in "professional" chat in the "Convention room" or in a friendly game at billiards, brought each evening to an agreeable close.

Some of the members returned to Matlock to spend the remainder of the week, and, at the "parting of the ways," all were agreed that the "excursion" was a marked success, and should be repeated next summer, the *locale* to be decided at the annual meeting in February.

Next meeting for council (*all members* being very welcome) will be held at Anderton's Hotel, London, on November 9, Lord Mayor's Day.

All the arrangements were made and carried out by the Secretary, D. J. O'Neill, of Birmingham.

PHOTOGRAPHING SINGAPORE FORTS.

An American Commissioner Before the Bench.

A fort is not, as a rule, the subject which an artist would select for his pencil, or a photographer desire to exercise his camera upon. Military secience demands that it should be an unobtrusive feature of the landscape, and generally its exterior is as unpicturesque as its interior is forbidding. Thus it follows that a man who deliberately sits down to sketch a fort is open to very strong suspicion of having a very different object for so doing than the enthusiasm of his art. But the amateur photographer unconsciously may find a fortress as an incident in a panoramic view, though totally indifferent to the fact. Such a case came before the magistrate, Mr. Innes, at the Police Court, on April 6, and it serves to call attention—not for the first time—to the language of the Ordinance dealing with the matter. Of course it is of the highest importance that there should be no technical loop-holes for escape from an offence which is of much political significance. At the same time the innocent operator of the Kodak who, over a wide track of country, secures a view which may include one or two fortifications, ought not to be ignominiously arrested as a military officer who has come to spy out the land. Mr. W. H. Jackson, a member of the World's Columbian Transportation Commission of America, who arrived from Bangkok recently, was out with his camera on April 5 in the neighbourhood of Mount Wallich. He secured from that point of vantage one or two negatives containing, as it happened, Fort Palmer. This was clearly an offence under the Ordinance, for the photographer was within 3000 yards of the defence. He was therefore arrested, conveyed to Fort Palmer, detained there about an hour, and then consigned to the police. His liberation was at length effected, after some difficulty, and Mr. Jackson appeared at the Police Court to answer the charge lodged against him. At the Police Court Mr. Stewart, Deputy Superintendent, asked for a remand because the negatives seized had not yet been developed. Mr. Joaquim, who represented the defendant, could not consent to this, because Mr. Jackson, with the other members of the party, were leaving for Java, *en route* to Australia, the next morning. He said that the offence committed had been quite inadvertent. The defendant was taking views of the settlement, and had no idea that he was including in his picture Fort Palmer, or that he was at the time on military land. There were no notices there to that effect, no sentries, and indeed no indications whatever that the property belonged to the War Department. The defendant fully admitted the technical offence, and was willing that the negatives should be destroyed. Mr. Jackson, addressing the magistrate, said that he had not trespassed intentionally on military ground, and was not aware that Fort Palmer had appeared in one corner of the photograph. The case

was adjourned for an hour, in order that Colonel Plunkett might be consulted with a view to withdrawing the case. Colonel Plunkett, however, replied that it was out of the power of the military to withdraw a prosecution which it was their duty to institute.

The magistrate then dealt with the case on its merits, and, having heard the defence, expressed himself as satisfied that there had been no criminal intent on the defendant's part, and he dismissed the case.—*Straits Times.*

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

The following are the papers that will be read during the Convention meeting:—

Some Points concerning Toning and Fixing, with lantern and other illustrations. C. H. Bothamley, F.I.C., F.C.S.

The Camera as an Aid to Technical Instruction, with Special Reference to Photo-micrography. F. R. Armitage, M.A., Organizing Secretary to the Salop County Council.

Ten Minutes of a Life History, an application of photo-micrography. Andrew Pringle, F.R.M.S.

Pictorial Photography; The Old and the New. Alfred Maskell.

On Interference: Colour Photography. R. Child Bayley, Assistant Secretary Royal Photographic Society.

Photography in Natural Colours, with lantern illustrations (triunial). E. J. Wall, F.R.P.S.

Our Editorial Table.

Exposure Notes.

R. Field & Co., 142, Suffolk-street, Birmingham.

We have received the new edition of *Exposure Notes*, for use with Watkins' exposure meter. This handy little book has been further improved by the introduction of new points, such as a method of calculating pinhole exposures, space for entering particulars of eikronometer development, and revised and additional jottings, &c. Even those who do not employ meters or other aids to exposure will pick up many a useful hint upon exposure and development from *Exposure Notes.*

A Treatise on Photometry.

By A. Palaz, Sc.D. London: Sampson Low & Co.

This is a translation of a work (in French) entitled, in full, *A Treatise on Industrial Photometry, with Special Application to Electric Lighting*, the translators being Messrs. G. W. and M. R. Patterson. It treats exhaustively of the principles of photometry, the various photometers, photometric standards, practical photometry, electric lights, and the distribution and measurement of illumination. Although primarily designed by the author to inform the engineer charged with the installation and operation of lighting apparatus, the book contains a vast deal on the subject of photometry which may conceivably be of interest to those concerned in the purely photographic side of the matter. The book is freely illustrated, and is obviously one whose value corresponds to the great labour expended on it.

The Moonlight Lamp.

This is one of the family of what has been known as the Sponge lamp, only it is more compact, being cylindrical in shape, and is intended for being placed as the illuminant in a ruby lantern. Its interior is padded with cotton wadding, which absorbs the benzoline, the surplus being then poured away. A wick dips down into a central space, and gets charged with vapour, which burns at the top with a small steady flame quite powerful enough to enable plates to be developed or changed by. The cut affords a good idea of its appearance. It is sold by the Moonlight Patent Lamp Company, Fenwick-chambers, Liverpool.



News and Notes.

On Saturday, June 22, the Darwin Photographic Association are having a camera excursion to Burnley, leaving Darwin at 1.43 p.m., and Blackburn at 2.3 p.m. The places to be photographed are Worston Hall, Spencer House, Townley Hall, Ormrod House, and Hurstwood Hall. A saloon will be engaged at Blackburn, and teas provided at Burnley. The fare will be at the ordinary excursion rate of a fare and a quarter. Any member desirous of joining must notify the Secretary by Friday night's post.

Japanese Portraits.—In consequence of Japan's repeated victories over China, the demand for photographs of Japanese officers is said to be very great in Europe and America. In the latter continent, Marshal Yamagata's portrait is much valued, while in Europe Vice-Admiral Ito is highly talked of. Photographs sold in Europe as Admiral Ito's are not genuine; it is said they are mostly portraits of Count Ito.—*The Japan Gazette.*

The Actress and her Photographs.—Among the applicants at the Thames Police Court on Tuesday, June 11, was a fashionably attired young lady, who stated she performed on the stage as a male impersonator. She ordered four dozen photographs from a photographer in the Commercial-road, and arranged to pay 6*s.* 6*d.* a dozen for the prints, which represented her in various characters. Eight shillings had been paid on account. Applicant had since been unable to get possession of any of the photographs, and had ascertained they were being shown and sold about the City. To that she strongly objected. On the previous day a canvasser, in the service of the photographer, sold her a likeness of herself. Mr. Mead said the only thing applicant could do would be to go to the County Court, and get an injunction to restrain the photographer from printing them. He thought she had a right to do that, but was not sure.

The following paragraph, says a contemporary, has appeared in a London paper:—"The latest idea in electricity, as imported from America, is that you can carry a stick of sunshine in your waistcoat. A New Jersey electrician, Mr. McFarlan Moore, expects soon to sell 'sunshine' that can be used as an illuminant for forty-eight hours, the light being obtained by pressing a button. He has not yet explained how he is going to do it; but he has hinted that it has something to do with molecular vibration. He does away with the 'red-hot hairpin' in the incandescent light, and makes the surface of the glass glow, with brilliant light without heat, the current being stored. 'Light sticks would be undoubtedly popular during the foggy season in London." In what part of the waistcoat the "stick of sunshine" is carried is not stated, probably for a good reason; but it may be safely assumed that this "stick of sunshine" is something like that etheric force or the Keely motor which has been "coming along" for about twenty years or more.

The Hand Camera in India.—After much careful thought and wide experience of all forms of hand cameras in India, I find that one to be best which enables the worker to put his plate or film in position for exposure from a well-protected magazine filled in the dark room. The other day I was given a new hand camera to try. It was beautifully made, and the double backs were the perfection of English workmanship. The subjects I had to take were out-of-door, and the time about noon. The heat was frizzling, of course. The plates I had put in carefully from a new batch in the early morning, and I had them protected in the camera case. Knowing the penetrating power of the sun's rays, I was especially careful, sliding them into position as quickly as I could, covering them as much as possible with my coat until exposure was complete, and whipping them back into the case with a celerity only gained by much experience. But not a single one of the plates escaped a fogging, and I know that the fog was due to this sunning, because I have just finished some experiments which show me that the plates were good, the camera light-tight, my exposures correct, and my developer irreproachable. But a little consideration will show the reasonableness of my contention. Even in studio work the plates are carried to the camera enveloped in a cloth, the camera is similarly protected, and the shutter drawn out carefully from under it. In like manner, in all good tripod work the focussing cloth is one of the protecting mediums from actinic rays. Experience has shown this care to be as necessary as a dark room for developing, yet some makers of hand cameras seem to ignore the fact that unprotected double backs are prolific of fogged plates. It is true that a hand-camera worker in these circumstances could use a protecting cloth, but who has ever seen such an adjunct to a hand camera, or would care to use such a protection when he can purchase one of many in the market which are absolutely light-proof without it?—*Journal of the Photographic Society of India.*

Mr. A. H. Baird, of 37 and 39, Lothian-street, and 2 and 4, Brighton-street, Edinburgh, writes:—"You will observe that I have changed my address. In my new premises the accommodation is fully three times as much as I had at No. 15. The workshop is now under the same roof, a great convenience. I have ample floor space, a feature I greatly lacked before. There are six air-tight show windows (mahogany and plate glass), and a wall case fourteen feet long by nine feet high. The office is screened off, and so situated that those sitting at any of the desks can command a view of all who enter or leave any of the departments. On the ground floor are the following departments:—Photographic materials (dark room, &c.), optical lanterns and accessories, general optical goods, office, wet and dry chemicals, educational apparatus, workshop. Downstairs are situated the chemical apparatus department (glass, wood, metal), lantern demonstration-room, bottle stores, packing-room. In outside cellars are kept carboys of the mineral acids (H_2SO_4, HCl, HNO_3), Winchester quarts of liq. ammonia, glacial acetic acid, and suchlike chemicals. The dark room on the ground floor measures eleven feet six inches by twelve feet, and is twelve and a half feet high. It is lighted both by daylight and a gas lamp, which latter is arranged to supply white, orange, or ruby light as may be required. There is ample bench room, and a stoneware developing sink thirty inches by twenty inches, and ten inches deep. The entrance to the dark room is novel and very efficient. The appended sketch shows that there are no doors, ingress and egress are effected without disturbing those at work inside, and the ventilation is good. The sides and roof of the entrance are painted dead black. The walls and roof of the dark room itself are of a chocolate-brown colour. For the coming winter season the lantern demonstration room will be ready. The walls and roof are to be of the same colour as the dark room, while at one end will be a very white and opaque screen. Parties purchasing a lantern will have its efficiency demonstrated; amateurs wishing to examine their slides by projection will be accommodated on certain evenings for that purpose. Scientists interested in the lantern polariscope, lantern microscope, &c., will have them fully explained and demonstrated befor purchase."

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, June 25, at eight p.m. at No. 12, Hanover-square. A demonstration by Mr. Packham of his process of toning platinum prints.

ON Friday, June 14, Mr. Hubert J. Elliott, of the firm of Elliott & Son, was entertained by the *employés* of the works at a dinner at the Old Salisbury Hotel, Barnet, to celebrate his return after a pleasant and profitable nine months' tour round the world, and also to mark their appreciation of his being installed as Manager. An enthusiastic reception was accorded him, and the felicitous speeches made on the occasion indicated the strong sense of loyalty that animated those present. The dinner was altogether a most successful function, and promised well for the harmonious working of principal and *employés* in carrying on the successful operations of the firm.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,445.—"Improvements in Hand or Magazine Cameras." F. W. HUDLASS.—*Dated June*, 1895.

No. 11,608.—"Improvements in Changing Boxes for Photographic Cameras." W. STANBURY.—*Dated June*, 1895.

No. 11,632.—"Improvements in or connected with the Printing and Retouching of Photographic Negatives." C. W. R. CAMPBELL and F. N. ALBANY.—*Dated June*, 1895.

PATENTS COMPLETED.

IMPROVEMENTS IN AND RELATING TO PHOTOGRAPHIC CAMERAS.

No. 12,119. WILLIAM ARTHUR DAWKINS, Speedwell Works, Warston-parade, East Warston-lane, Birmingham, Warwickshire.—*May* 4, 1895.

THIS invention relates to the class of photographic cameras technically known as the detachable camera or the hand camera, namely, cameras used more especially by amateurs. Such cameras are usually provided with a dark chamber composed of black linen, leather, or such like compressible material, secured to the upper end of camera in such a manner that the bag can be pushed into the camera and inclosed by means of a lid when not in use, and when in use the bag can be expanded outwards from the camera. The object of this old-style bag is to produce and retain a dark chamber, within which a number of sensitised plates are provided ready to receive photographs. One of the series of sensitised plates is in the position ready for exposure, and the remainder of the plates are behind the first plate. The operator, after having obtained a photograph on the first plate, puts his finger and thumb on the outer surface of the collapsible bag and lifts the pictured plate from its front position, and moves it to the rear position behind the other plates, thus exposing a fresh plate ready to receive a picture. This old-style method has some disadvantages, because the collapsible bag is continually taking fresh creases, and thereby becoming worn out or imperfect; the operator in lifting the plates becomes impatient (especially an amateur), and cannot spontaneously select a part of the bag to grip with his finger and thumb over the plate with the satisfactory knowledge that, when the plate is lifted, the bag will extend upwards sufficiently to enable the operator to lift the front picture plate clean over the top edges of the sensitised plates so as to lower the picture plate at the back of the blank plates. Several attempts have to be made in the lifting of the picture plate. It will be apparent that, from the causes hereinbefore set forth, the expandable bag is very quickly creased, worn, and otherwise injured, rendering it no longer an excluder of light, and consequently a camera made with such a collapsible bag cannot produce perfect pictures. The pictures are foggy and spotted on account of rays of light penetrating through the imperfect bag.

My invention relates to the collapsible bag. Instead of making a pocket-shaped flabby bag, I make my dark chamber by means of leather, linen, vulcanised linen, vegetable leather, or any suitable material such as that used in the old style of bag, or such as would be more suitable for making a dark chamber, and I make the chamber in the form of a pleated accordion. The pleats may be at the sides only, or at the ends only, or at both the sides and the ends. The pleated accordion chamber has definite dimensions. Instead of the sides and the ends collapsing and expanding to indefinite directions, my accordion-pleated chamber collapses and expands each time within the same pleats, consequently there is an internal chamber of definite dimensions corresponding to the camera chamber—that is to say, when the width of removable sensitised plates is four inches, I make the internal length of my dark chamber about four and a quarter, more or less, and the internal width a little over the space occupied by the nest of plates. Thus, if the nest of plates measured two inches across, the internal width of my dark chamber would be about two and a quarter, more or less. On the last layer of the accordion pleats I secure a collapsible sheet or piece of material suitable to take hold of by means of thumb and finger to remove the picture plate.

In using my improved accordion-pleated dark chamber, such box-shaped collapsed chamber would be lowered over the nest of sensitised plates, and the lid closed in the usual way to take the first picture. After the first picture had been taken, the picture plate could be taken hold of by means of the top collapsible sheet, the operator would readily clip the top end of picture plate and lift it in an upward direction under the collapsible top sheet, and such lifting action would expand the accordion pleats to the required height, the height being regulated by means of the pitch of the pleats. It will be readily understood that, having lifted the plate to a definite height, it could be tilted between the fingers and thumb so as to move the bottom edge of the raised plate within the open space or chamber provided between the accordion pleats, until the bottom edge of the lifted plate reached the proper position to pass behind the sensitised plates.

The providing of an accordion-pleated dark chamber for the purpose described constitutes my invention.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

June.	Name of Society.	Subject.
24	North Middlesex	*Objects in Motion and Pictorial Photography.* H. W. Bennett.
24	Richmond	
25	Birmingham Photo. Society	*Experimental Toning.* Frank Cason.
25	Hackney	
25	Halifax Camera Club	
25	Lancaster	
25	Leith	
25	Paisley	
25	Royal Photographic Society	Demonstration by Mr. Packham of his Process of Toning Platinum Prints.
25	Warrington	
26	Bath	
26	Burnley	
26	Croydon Camera Club	Photographic Chat. Prints for Club Album to be submitted.
26	Leytonstone	
26	Newton Heath	Demonstration: *Rival Developers.* By Members.
26	Photographic Club	
26	Southport	
27	Glossop Dale	
27	Halifax Photo. Club	
27	Hull	
27	Liverpool Amateur	
27	London and Provincial	Annual Meeting.
27	Oldham	
28	Cardiff	
28	Croydon Microscopical	
28	Holborn	
28	Maidstone	
28	Swansea	
29	Ashton-under-Lyne	Exc.: Shrewsbury. Leader, Dr. Hamilton.
29	Birmingham Photo. Society	Excursion: Salford Priors and Cleeve Prior. Leader, E. Underwood.
29	Handsworth	Exc.: Broom. Leader, A. H. Garman.
29	Hull	
29	Putney	Excursion: Richmond Park.

ROYAL PHOTOGRAPHIC SOCIETY.

JUNE 18,—Photo-mechanical Meeting,—Mr. James A. Sinclair in the chair.

Not more than twelve members assembled to hear Mr. GLEESON WHITE read a paper on *Drawing for Process Work*. The author, however, did not confine himself to the lines laid down by his title, observing that he thought the essential requirements of drawing for reproduction purposes were now thoroughly well understood, having so frequently been described in books and papers. His address took the form of a defence of process work for the reproduction of artists' drawings, and he cast ridicule on the laments expressed over the decadence of wood-engraving, and the suggested inferior qualities of artists' work (phototypically reproduced) in the illustrated papers and magazines as compared with that of the "sixties." His opinion was that the process work did not suffer by comparison with wood-engraving, and that equally so the reproductions of the drawings of such men as Pennell, Phil May, and Greiffenhagen were such as did credit to the photographic etcher. He appeared to think, however, that it was desirable the work of the block-etcher should occasionally be supplemented by the artist's final touches on the block.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 13,—Mr. R. P. Drage in the chair.

It was announced that at the end of the present month the Association will remove to new rooms, at the Raglan Hotel, Aldersgate-street, E.C.

Mr. C. H. OAKDEN addressed the members on the subject of *Outings*, which he thought should be encouraged, in order that members should get opportunities of variety of work, and exchanging ideas with other workers. Younger photographers especially would derive much benefit in learning the exposures and treatment of subjects adopted by the older workers, while the latter might also pick up new ideas. Remarking that there was no copyright in a view, Mr. Oakden defended the practice of one man taking a view from the same standpoint as another on the ground that one man had a perfect right to try to (and might) produce a better result of the one subject than his fellow-member who exposed on the same view. He deprecated the existence of cliquism in photographic outings, which he thought should be in the hands of a competent director of excursions, to whom the railway and other arrangements should be intrusted. A leader for each outing, one who knew the district and its artistic characteristics should also be appointed, and the members should loyally support him, and not indulge in "chipping" or grumbling. Mr. Oakden concluded by suggesting joint or amalgamated outings between the various London societies.

A discussion followed.

Mr. P. EVERITT drew attention to the facilities for hand-camera work which might be availed of in Central London, *i.e.*, Fleet-street, the Strand, Trafalgar-square, &c.

Mr. W. D. WELFORD spoke in favour of the social side of photographic society outings, remarking that there was as much to be said in favour of these bodies holding outdoor as well as indoor meetings.

Mr. T. E. FRESHWATER, Mr. E. H. BAYSTON, and other members spoke in the same strain.

Reference having been made to the circumstance that the Association's outings were discontinued last year through lack of numerical support on the part of the members, it was thought that the present was a fitting opportunity for reviving them, and Mr. A. L. HENDERSON proposed, and Mr. BEDDING

seconded, that six Saturday afternoon outings be held during the summer. This was carried.

Mr. Oakden received a vote of thanks, and the meeting terminated.

PHOTOGRAPHIC CLUB.

JUNE 12,—Mr. Walter D. Welford in the chair.

Mr. Sinclair showed Theodore Brown's stereoscopic transmitter.

Mr. E. J. WALL said that he had tried one of these instruments; it gave a stereoscopic effect, he would not say a correct one. It transposed the subject. Mr. Wall, as promised, brought Mr. Lovibond's tintometer, which he went to a great amount of trouble to explain. It would be quite impossible to describe the facility, however, with which Mr. Wall dissected colours, or rather matched them. With the aid of some 400 glasses, he could readily trace the combination of a given colour—glass, powder, wool, solution, or printing inks. He said that he was experimenting in the direction of applying the instrument to photography.

The members present saw something new and much that was interesting, and were unanimous in passing the vote of thanks, which was proposed by Mr. Bridge and seconded by Mr. Cowan.

Mr. WALL, in acknowledging, said that thanks were due to Mr. Lovibond for loaning the instrument.

Mr. COWAN proposed a hearty vote of thanks to Mr. Lovibond, which was seconded by Mr. TOTTEM, and unanimously accorded.

Croydon Camera Club.—On Wednesday, June 12, the PRESIDENT (Mr. Hector Maclean, F.R.P.S.), read a paper and gave a demonstration upon *Collodio-chloride Printing Paper*. In the course of his lecture he animadverted in severe tones upon the use of gelatino-chloride papers; their uncertain action, double tones, ugly tones, degraded high lights, and, above all, liability to fade being dwelt upon. Collodion paper was described as free from all such faults. Mr. Maclean had carefully tested a matt-surface paper made by the Paget Prize Plate Company, which, toned in an acid bath containing both platinum and gold, yielded prints which were at first sight hard to distinguish from platinotypes. He found the paper to readily print, and to rapidly tone in the above bath, the full formula of which will be, in due course, published; the high lights were of absolute purity, and the paper left little to desire except that it had some tendency for small portions of the film to flake off, unless much care in handling be observed. Mr. Maclean showed pairs of prints which contrasted the range of tones obtainable with the above paper and platinotype. Mr. HARRY LETTS contributed several whole-plate photographs of Swiss scenery, printed and toned as above, while Mr. H. E. HOLLAND handed round prints which had been passed through the ordinary sulphocyanide bath. Mr. Maclean then proceeded to demonstrate the various operations needful, and in the course of a very few minutes toned several prints. In the discussion Mr. WHITE, while endorsing all that the lecturer had brought forward against gelatine, and in favour of collodion in conjunction with silver as printing medium, objected to it on account of the liability of portions of the sensitised surface to become detached from the paper; he had from this cause spoilt over a hundred prints out of two hundred manipulated. This was, however, two years ago, and he had hoped that to-night he should have been told that, with recent improvements, the film held fast. Mr. HOLLAND had met with the same trouble as referred to by the previous speaker, otherwise he was well pleased with the paper and the results it gave. Mr. S. H. WRATTEN, in proposing a vote of thanks to the lecturer, mentioned that he had, about a year ago, tried a sample of collodion paper which had no tendency to any abrasion of film as complained of, but suffered with the drawback of tightly rolling up directly it was placed in water, so that it was not easy to flatten out and manipulate. The makers advised that, on first wetting, the paper should be put in a shallow dish containing very little water. This, the speaker found, was a satisfactory remedy. Mr. NOAKS seconded the above vote of thanks in appreciative terms, which was then adopted with applause. Reports of excursions to Fittleworth, and also to Sedwick Castle were made, and work done at foregoing shown. An excursion, led by the President, to Oxted, was announced for Saturday, the 22nd, leaving East Croydon at three minutes past two p.m.; tea at Hoskins' Arms Hotel at seven. Mr. H. Myrtle was elected a member.

Hackney Photographic Society.—June 11, Mr. E. Puttock presiding.—Mr. DEAN gave a report of the excursion to the Zoo on the preceding Saturday. Members' work was shown for criticism by Messrs. Grant, Roofe, Newton, Westcott, Wilks, Hudson, and Gosling. In the course of the evening Mr. Wm. RAWLINGS gave a demonstration on the new cold-bath platinotype process. He said that the platinotype process had the charm of being permanent, exceedingly simple, and lent itself most readily to the attainment of artistic results. It had a beautiful matt surface, and, as the whites were purer and the blacks deeper than in any silver printing paper, it had a greater scale of gradation. The speaker then dealt most thoroughly with the whole procedure of printing and development, and developed a number of prints by means of both the brush and bath methods, the results being much admired.

Putney Photographic Society.—The first summer outing of this Society took place on the 8th inst. to Burnham Beeches under the leadership of Mr. W. Martin, jun., Hon. Secretary. The members were favoured by most lovely weather, and, after exposing a good number of plates on the beautiful woodland scenery, the party sat down to a substantial meal, which was served on the lawn of Mackros Cottage.

Streatham Photographic Society.—At the General Meeting of the Society, held at 14, Greyhound-lane on the 12th inst., the following gentlemen were elected: Messrs. C. C. Robinson, F. G. Travers, F. W. Pratt, and A. B. Miall. Mr. A. W. James (Assistant Secretary) gave in the report of Excursion Committee, which was duly accepted, and the excursions fixed are: For Saturday, June 15, to Croham Hurst, and for June 22, Battersea Park. Mr. Stone gave a lecture on *Development*, which was discussed by those present. The subject chosen for discussion at the next General Meeting, to be held on June 26, was, *Various Printing Processes*. All particulars as to excursions, membership, &c., can be obtained of the Hon. Secretary, Mr. J. J. Laws, chemist, Streatham Common.

Leeds Photographic Society.—One of the most interesting and instructive lectures of the session was delivered before a large attendance of members at the Society's room, under the chairmanship of the President (Mr. J. H. Walker), on Monday evening, June 17, by Dr. THOMAS THRESH, M.A., L.R.C.P., the subject being *The Comparison of Modern Developers*. After explaining the theory of the action of light upon the silver haloids, the development of the latent image was scientifically discussed in all its bearings, the *modus operandi* being lucidly explained. Next came the chemical part of the subject, in which all the component parts which go to form the different developers were described, and their actions and uses in varying proportions fully detailed. Reducers, accelerators, restrainers, and preservatives were described, and it was shown the peculiar advantages one possesses over another in different classes of work. The lecturer advised all amateurs to thoroughly master the subject in all its details before commencing to photograph objects, and then this should always be done in an experimenting manner, notes being made and retained for future reference; but all the experiments should have some definite object in view. By so doing, many plates would be saved and much practical knowledge obtained. Much time was occupied in considering two most important parts in development, viz., what a negative should be, and the correction of over and under-exposure, each of these being sufficient for a lecture in such able hands. The latter part of the lecture was devoted to the present developers in use, and these were classified under three heads, viz., acid, alkaline, and neutral. A full description of ferrous oxalate, pyrogallol, hydroquinone (single and combined), eikonogen, amidol, metol, glycin, and rodinal, the good and bad qualities of each, the suitability of one over the other for different classes of work, together with numerous formulæ for the above developers, brought a long lecture, but a pleasant evening, to a close.

FORTHCOMING EXHIBITION.

1895.		
June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

FILM NEGATIVES.

To the EDITOR.

SIR,—I enclose you two negatives which have an interest as bearing on the question of the durability of films, one of them being on a Carbutt Eclipse film nearly four years old, and the other on one of the same brand just received. I can answer for two years of the four personally, the packet having been in my possession that time, and Mr. Carbutt informed me that it had been coated in September, 1891. They were developed with the same developer; but the difference is important as indication for those who may be required to use old films—the exposure of the old was three times that of the new, and, if I had given four times and added a little bromide, it is probable that no one could have seen the difference between the two negatives. Mr. Carbutt tells me that he gives his films a final wash in an alkaline solution previous to coating, as he has found by careful testing that the acid fumes evolved by the celluloid are strong enough to turn test paper red. I have received another sample of films and plates from Dr. Smith, both coated with the same emulsion, and this time of the most rapid which he sends out, his green brand, as in the case of the slower red, I find not the slightest difference between glass and celluloid vehicle in the fresh plate, and I put away the remainder for the test in keeping. These plates are the most rapid of Continental make that I have been able to obtain, and, *à priori*, it must be expected that the keeping qualities will be less in proportion than in the slower samples.—I am, yours, &c., W. J. STILLMAN.

Rome, June 13, 1895.

TRIMMED SIZES OF PAPER.

To the EDITOR.

SIR,—Mr. Lindsay, in his paper, *Gelatino-chloride up to Date*, writes that "the first firm that gives trimmed sizes of paper shall have his custom." They shall certainly *not* have *mine*.

Unless the trimmed paper were placed very accurately upon the negative, which is not always an easy matter, it would need to be trimmed over again. And, besides, I never trim my prints to any fixed size, but I trim each print according to its own need. Very often a print is much improved by removing part of the sky or foreground or one end. And is it not better, then, not to use ready-trimmed paper?

For portraits, especially by professionals, trimmed papers might be useful, but certainly not for the general run of amateurs' work.

Bawnboy, Co. Cavan, June 15, 1895. AN AMATEUR FROM 1857.

RE MEETING OF ASSISTANT PHOTOGRAPHERS.

To the EDITOR.

SIR,—The meeting advertised was held and, although not by any means a large one, it was sufficiently encouraging to warrant another at a more convenient time of year. *Re* the Benevolent, those present at the meeting and letters I have had on the subject from old members and friends of mine, as well as from strangers to me are all of the same opinion as your correspondent "A Well-wisher," that it must be made a benefit society, from which the members alone have a right to its help, and I have little doubt but what at our next meeting something tangible will be effected.

The notion of having an Assistants' Society for the discussion of photographic matters was approved, and when a meeting is next called an interesting lecture and demonstration will be given.

Thanking you for your kindness in giving me the necessary space and, in consequence, the practical sympathy with the movement, I am, yours, &c.,

W. T. WILKINSON.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED:—

Thomas Bromwich, Bridgenorth.—*Portrait of I. J. I'Anson Bromwich.*

John Ramsden, Leicester.—*Portrait of a boy as a Judge, and entitled "The Verdict."*

Henry Jenkins, Tunbridge Wells.—*Portrait of Miss Sharman and one of her orphan babes.*

Horace Greave Pike, Lichfield.—*Photograph of a water-colour drawing of old Lichfield.*

Frederick Spalding, jun., Maidstone.—*View of the "Easterford" Masonic Lodge at Kelvedon, Essex; a group of Freemasons at the opening of the Easterford Lodge; two portraits of the Right Hon. the Earl of Warwick in Masonic clothing.*

GEM DRY PLATE COMPANY.—Received; in our next.

W. TIDDY.—Precipitate your silver out of doors and then the smell of the liver of sulphur will not offend.

LEEDS.—We can scarcely imagine that brand of plates frilling, unless the solutions or the washing waters were unsuitably warm. The alum bath is the only remedy we can suggest for them.

T. MATHEWS.—We do not know the name and address of the manufacturer of the mount enclosed. You will, however, obtain them from such houses as Marion's, Adams's, Fallowfield's, and the like.

MOUNTS.—1. We do not know the address of Messrs. Schiebel or of their English agent. 2. You may quite safely copy the engraving of the Rev. John Wesley, published over a hundred years ago.

C. R. J.—The experience is by no means unusual with magazine cameras, but it is not always the fault of the apparatus. More often than not the trouble is due to the worker not using the apparatus properly. The camera referred to is generally considered a reliable one.

SALVO.—We quite sympathise with you, but the photographic market is so thoroughly overstocked with skilled labour in every direction that we should certainly not advise you to enter the field, and particularly not to pay any large sum to be "articled," especially at your age.

H. POWELL.—The most useful studio will be one of about thirty feet long by about fourteen feet wide, of the "lean-to" form, with a north aspect, or the ridge-roof form may be adopted if preferred. But, if a north aspect can be secured, we prefer the lean-to form for general all-round work.

X. Y. says: "I should be greatly obliged to you if you could give me a reliable formula for making iodiser for Schering's celloidine collodion."—Either of the formulæ given on pages 837 and 838 of the ALMANAC will do quite well for Schering's collodion, or collodion made with Schering's celloidine.

ALF. JONES.—The usual formula for the "acetate toning bath" is: Acetate of soda, 30 grains; chloride of gold, 1 grain; to water, 8 or 10 ounces, and mixed not less than twenty-four hours before it is required to be used. Additions of other materials are sometimes recommended, but we ourselves never employ them, nor, we believe, do the majority of professional workers who employ this bath.

B. W. (Liverpool).—The print sent is a collotype, and not a silver print, though it is glazed to imitate one. It is an excellent print, and seems to show to what perfection collotype is carried abroad. We are not surprised that two professional photographers pronounced it to be a silver print. We have some mechanical prints that have deceived experts as to the process by which they were produced.

M. W. C.—No passport is required in Germany, but our advice to all travelling abroad, particularly in the neighbourhood of the Franco-German boundaries, is to be provided with one. It is easy to obtain, and the cost is nominal. One is seldom wanted, but when it is, it is generally wanted badly. An English passport has more than once helped an English photographic tourist out of trouble on the frontier.

E. B. says: "Would you kindly inform me which is the best hand camera to get, price about 4*l.* or 5*l.*, and whether it is best to have one that takes films or plates?"—In reply: You had better obtain a copy of our 1895 ALMANAC, in which a large variety of hand cameras are advertised, and from which, by the assistance of some photographic friend, you will be able to make a selection in conformity with your requirements.

G. C. BENNET.—The exhibition of the results of the photogravure competition closed on Saturday last week. The original picture was not shown at the Exhibition, but it can be seen at South Kensington. It was a pity you made a mistake in the date. We do not know if you will now be permitted to copy the painting to show the results of the process you have worked out. Any application must now be made to South Kensington, not to the Society of Arts.

E. WILLIAMS.—No special information on the subject has been published. Some years ago Mr. William Brooks produced some very good photographs of the interiors of wine cellars. He obtained them by illuminating the cellars with a considerable number of paraffin lamps, so distributed that they illuminated the vaults without being themselves seen. In place of paraffin and a long exposure, magnesium can be employed. That will, of course, entail a much shorter exposure than the illuminant Mr. Brooks used.

ANSWERS 1, 2, 3.—If the picture is copyright in Germany, it may be taken for granted that it is copyright here under the International Copyright Act. The interests of German publishers are pretty closely watched here by their English agents, and infringers of copyright have several times been proceeded against in our courts and been cast in substantial damages. It is not required that the proceedings be taken in the foreign country in which the copyright is obtained. English law gives the necessary redress to foreigners in the same way as foreign laws give English copyright holders redress.

PERPLEXED PRINTER writes: "I shall feel greatly obliged if you will give me a solution to the following query:—In the formula for toning collodion chloride matt-surface paper (Paget's), it is recommended to use acid phosph. dil. B. P. and acid hydrochloric dil. B. P. I can fully comprehend the formula except the dil. B. P. There I am perplexed. Kindly explain the meaning of this dil. B. P., as I am anxious to try the formula."—The terms "dil. B. P." means that the acids are diluted according to the strength given in the British Pharmacopœia. If our correspondent buys his diluted acids of any dispensing chemist, he will obtain the correct thing.

W. H. BRISON.—It is quite impossible for us to give the slightest idea as to the actual cause of the spots. As the spots do not appear, according to your letter, when you do the whole of the work yourself, it would seem to indicate something in the manipulations. However, one paragraph in your letter may possibly throw some light on the matter. You say that all the work in connexion with the prints is done in the same room in which the bromide and the platinotype processes are worked, and in which the negatives are also developed. Now, any particles of the materials used in the latter work coming in contact with the prints would certainly produce spots of one sort or another. We should advise using a separate room for the silver prints, and see the result.

REV. J. J. M. PERRY.—Our correspondent writes: "On page 585 of this year's ALMANAC you have a chapter on 'Iridescent Effects in the Stereoscope' (chapter ix.). I am greatly interested in stereoscopic photography, and may I ask you kindly to give me a little further information on the above subject? I confine myself almost entirely to stereoscopic transparencies. Would aniline dyes applied to the cover glass or to the back of each picture produce the effect, or must the film be stained? What colours are proper to use? Is one colour to be applied to one picture and another to the other, or are different sets of colours to be used, one set to one picture and another set to another? A description of the *modus operandi* would greatly oblige."—In reply: As we have stated, the whole secret consists in tinting one picture, say, the left one, with one set of transparent colours, such as green or carmine, applied to the shells by means of a brush, the corresponding picture, or right-hand one, being similarly tinted by transparent blue or violet. Our own pictures of this class have been on paper; but, by giving a glass transparency a coating of albumen, the tinting may be applied to it direct. Our experiments were made with the aniline colours sold in small bottles for tinting photographs. Better dilute them to a considerable extent before using.

*** *Several friends and correspondents have directed our attention to an advertisement of The European Blair Camera Company in our last issue. We take this, the very earliest, opportunity of stating that it was by pure inadvertence the advertisement was allowed to appear in such terms, and we hasten, in dissociating ourselves from the unfortunate sentiments it conveys, to express our regret that it has appeared in the advertising pages of this Journal, as well as to deprecate the unbusinesslike and regrettable method of advertising adopted.*

CONTENTS.

	Page
A TELESCOPIC FOCUSSING FINDER	385
PROFESSIONAL PORTRAITURE: A BUSINESS MATTER	386
THE DEVELOPING EQUIVALENTS OF THE ALKALIES. By W. B. BOLTON	387
EMULSION FOR THE LIPPMANN PROCESS. By R. CHILD BAYLEY	388
A PROMISING PRINTING PROCESS. By HECTOR MACLEAN, F.G.S.	389
LABORATORY NOTES AND NOTIONS. By E. BANKS	390
THE NEW PHOTOMETRIC STANDARD. By FRANK B. GRUNDY	391
THE HALF-TONE THEORY	392
PHOTOGRAPHING LIGHTNING. By W. N. JENNINGS	392
ANNALS OF THE OLD SCUTH LONDON PHOTOGRAPHIC SOCIETY. By FRANK HOWARD	394
SUMMER EXCURSION OF THE N.A.P.P.	395
PHOTOGRAPHING SINGAPORE FORTS	396
THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM	397
OUR EDITORIAL TABLE	397
NEWS AND NOTES	397
RECENT PATENTS	398
MEETINGS OF SOCIETIES	398
FORTHCOMING EXHIBITION	399
CORRESPONDENCE	399
ANSWERS TO CORRESPONDENTS	400

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

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PHOTOGRAPHERS AS DRAUGHTSMEN: THE CAMERA OBSCURA.

We have long thought that photographers who wish to be considered artists in the broadest sense, and some of whom arrogate to themselves the title, should bestow a little of their leisure time in acquiring at least the elements of free-hand drawing. The ability to draw as well as to photograph confers an intense pleasure to the one who is able to do both. We all know that artists, as well as poets, are born, not made; but it is quite possible for any one, not actually a noodle, to acquire at least a modicum of artistic knowledge, such an amount, at any rate, as will enable him to make a sketchy semblance of any scene before him.

It is on record that those past masters of our science—Daguerre and H. Fox Talbot—used to prowl around fine scenery, making sketches thereof by means of the camera obscura, the camera lucida, and, failing these, by the unaided pencil. These, as we all know, led to their desiring to obtain the fullest details of such subjects by chemical means, in which they ultimately succeeded, and thus was photography, as it now exists, initiated.

The camera obscura has many different forms, according to the purpose for which it is to be employed. Although the celebrated Baptista Porta has been said to have been its inventor, there is some reason for believing that it was known before his time. The photographic camera is, in a strict sense, a camera obscura (dark chamber), but not in the sense in which the term is now employed, which may be said to be the visual examination of external objects depicted on a white table as in life. Almost every reader will have seen the instrument on a large scale in popular observatories or at the seaside resorts. It here assumes the form of a large lens of long focus at the top of an erection to which no light is admitted save that which passes through the lens, the image thus formed being projected downwards upon a flatted white table, around which the spectators sit.

Those little finders with which so many hand cameras are now fitted are also cameræ obscuræ, but are of no use as drawing cameras, any more than are the much larger ones of the fancy bazaars or toyshops. They all show nature as it is, in its forms, colours, and all; but everything is reversed as regards right and left, and consequently are useless for the purpose which we are now advocating, viz., projecting a scene on a flat tablet capable of being traced in outline by the pencil.

That artists do not—or, at any rate, *did* not in former times—disdain to make use of the drawing camera obscura is evinced by the numerous and ingenious portable contrivances brought into the field some years since, and, for all we know, may still be so; only we have an idea that photography has had an influence in revolutionising this.

A good portable instrument of this nature may be made to serve many useful ends in addition to giving a good "copy" for the budding artist who is learning to draw. But the first thing one should do is to acquire the art of interpreting nature when depicted on his tablet, with a few freehand touches of a pencil, so as to leave no doubt as to which tree of a series is an oak, an ash, an elm, or a weeping willow. This is an art that can be readily acquired by the study of any of the numerous handbooks on drawing from nature, sold by artists' colourmen usually for a shilling. Education of this elementary nature having been obtained, the aid of the camera obscura may then be invoked.

A missionary friend was about to go to some place on the Zambesi, and was desirous of educating himself before starting as to the best means of enabling himself to send home views which should enable him to depict the scenes, among which he should be located, with a fair degree of accuracy. Photography was out of the question at that time, and he could not draw. The advice we gave savoured of what we have just written, and we designed for him a very portable camera obscura, which, when folded up, could easily be carried in his coat pocket, all but a stand on which it was to be erected. Its principle was this, and we commend it to photographers who wish to learn how to make pencil sketches without the aid of photography: A lens, of about fifteen inches focus, is mounted at the head of a pyramidally mounted opaque black cloth, erected on a stand, having at one side an aperture, through which is inserted the right hand with a pencil, on the base being spread out a sheet of paper, and in the rear of the cover cloth an aperture through which the face of the observer can be directed downwards, so as to see the image formed by the lens, outside of which is a small mirror, placed at an angle of forty-five degrees, so that external nature is thrown down and sharply focussed upon the paper below. It is not of vital consequence that the dark covering cloth be absolutely light-tight, as it would be were the operation a purely photographic one, for, as we have proved, it requires a very considerable leakage of light to obliterate or render unduly dim the image formed by the lens, which, by the way, and for this purpose, need not necessarily be an

achromatic one, worked with a small diaphragm. It may be here stated that through the humble instrument described the friend spoken of ultimately became a fairly expert draughtsman, even without its aid.

We purpose taking an early opportunity of going into the details of the whole matter optically, and mechanically, of the construction of the camera obscura, from the mammoth instruments which form such attractions to the multitudes, as well as the not humbler, but perhaps more useful, aids to drawing, of which we have spoken.

PHOTOGRAPHING OIL PAINTINGS.

Continuing the recountal of the experiences referred to in our article on this subject a fortnight ago, we promised to state how the difficulty of "chilling" was overcome. The effect described by this term, when it is correctly employed, is as though milk had been smeared over the surface of the painting, all the colours being dimmed and robbed of their richness, and frequently offering an almost insuperable obstacle to correct photographic rendering. The cause is usually a series of microscopically fine cracks in the face of the varnish; they reflect the light irregularly, and the result that injures so many pictures is, unless mechanically remedied, quite permanent. Remembering our informant's advice — not ignorantly to tamper with a painting—he states that this true chilling may nearly always be removed by lightly rubbing the surface of the painting with a drying oil, such as nut or linseed. He reminded us that the latter oil was liable, in course of time, to turn dark, that being one of the chief objections to its use. The full effect and the minimum danger, however, will be obtained if the surplus oil be carefully removed with a clean, soft linen cloth. When the picture has been very rough, our informant has left the oil upon the surface until the negative was taken.

There is, however, a spurious "chilling" which is merely the effect of the gradual accretion of atmospheric deposit, such as comes upon all objects exposed to the air, and which surface is not touched. Sponge and distilled or pure rain water usually suffices to remove this film, which, if the result of years of neglect, is apt to adhere very tenaciously. With many people who consider themselves learned on this topic a slice of raw potato, well rubbed over the surface, is their fetish, we were told. A picture with a very delicate glazing of colour might suffer from such friction, slight though it were.

These untoward difficulties produced by dirt merge by insensible stages into a question of reflections, which, it will be remembered, was the second of the two chief difficulties quoted. Hence, when the actual work of placing the picture before the camera is begun, the very precautions taken to suitably illuminate it, and avoid reflections, are just those needed to reduce the effects of "chill" to their lowest point of danger.

If, then, the picture-copier imagine the painting he is to work from to be a glass mirror, he will be in a position to know how best to proceed; for the surface of the oil painting reflects objects more or less as a mirror would according to the greater or less glossiness of its surface. A typical room for the purpose would be one entirely lined with black velvet, and with a narrow window to admit enough light. This being an impossible condition, everything should be done to make the room as near an approach to it as may be. It was found that, when the light was received upon the canvas well from one side, none from the front, and none from the opposite side, the best effects were always obtained. Then, all light objects opposite the painting must either be removed or screened; failing this, a foggy spot due to a scattered reflection would be seen. If the room in which the painting was placed had more than one window, one only should be used, the picture be placed almost at right angles to it, and the rest of the windows entirely darkened where this is possible.

By these means the reflections were to a great extent nullified. It will be seen that it is assumed that the photographer has been able to take the picture from the wall to get the best light; if this be impossible, conditions as near as they can be made to approach to the above must be aimed at. It will be found that, the further the camera is removed from the painting, the fewer the number of reflecting objects it will be necessary to deal with, hence long-focus lenses should be employed. For those who have much of this work to do a large black cloth hung upon a framework, and pierced with an aperture in the centre through which to insert the lens, will be an invaluable aid to the highest class of results.

The use of dry plates has greatly simplified photography of this kind, and especially in the case of difficultly illuminated paintings. Where good results are impossible with daylight, it is a very simple matter to illuminate the painting with gas, or even a series of petroleum lamps, taking similar precautions to those described as to having the light, or lights, well to one side or high overhead. On no account should the lamps be placed on the floor in front of the picture, or the flickering of the hot air will prevent sharpness. A painting set before the camera, and illuminated by comparatively dim flames, will be taken all right if sufficient time be allowed—a whole day if necessary. But the lights must be some distance from the picture, or the illumination of the two sides will be uneven. It will scarcely be needful to point out that the light should fall as it did upon the canvas while being painted, for the impasto of some painters would produce great roughness if the light fell wrongly. When the placing of the picture is limited to a particular corner or part of a room, the coarseness of the impasto may sometimes require the picture to be turned upside down.

We will conclude by saying that, with artificial illumination, a yellow screen is often not needed to produce (with orthochromatic plates) due colour value.

Finally, let us again re-echo the advice given more than once in these articles, not to tamper with an oil painting by oil, or, indeed, anything applied, unless the operator be thoroughly used to paintings and their technique.

A CONTINUOUS TONING BATH FOR GELATINE PAPERS.

The need of a truly reliable toning process for gelatino-chloride prints that is capable of use day after day, or at intervals, is sorely felt by a large number of amateurs, whose toning requirements seldom extend beyond a few prints at a time, and those not, perhaps, on an average more than once a week. The professional, as well as the amateur worker on a larger scale, would also benefit by such a system, since, besides an appreciable saving in gold, the result would, in all probability, be greater uniformity and better quality of tone.

In the case of the small worker it is easy to give the advice

to save up a sufficient number of prints to make it worth while to tone a batch; but circumstances will not always permit this, and the amateur who has to operate upon, say, a dozen quarter-plate prints at once is working at a serious disadvantage. We will say that a grain of gold will tone a couple of dozen prints of that size—about the average number—it follows, then, that the bulk of the bath cannot be made up without using a large excess of gold to more than about five ounces for a dozen pictures. In this quantity of solution, however advantageously used, it is impossible to manipulate, with any hope of success, more than three or four prints at once, and even then considerable dexterity will be necessary in order to secure evenness of tone in the individual prints. But it is obvious that the first prints toned will have the benefit of a bath rich in gold, while the last have to take their chance in the almost exhausted solution, with what results, as regards uniformity throughout the batch, may be well imagined.

The worker on a larger scale is but a degree better situated, for, though he may employ a larger bulk of solution in proportion to his number of prints, it must still vary very much at the beginning and at the close of the operation respectively, unless a considerable excess of gold be used, which has to go to the residue tub at the finish. If, however, the toning bath could be carried over from day to day, as was formerly the custom, then a proportionately larger volume of solution could be kept of normal strength. In consequence of the increased volume of the bath, there would be proportionately less fluctuation in its character during use, and larger numbers of prints could be manipulated at once, with every benefit both to equality of individual tones and uniformity in the batch, while the loss of gold, or the trouble of recovering it, would be reduced to a minimum.

It is not all toning baths, even with albumen paper, that are capable of repeated use in the manner suggested at the mere expense of strengthening with the quantity of gold abstracted, but at least one of those now in general use for gelatine paper—the acetate bath—was formerly so employed, and actually improved by use. That it cannot be employed in the same manner with gelatine papers we are far from alleging, but that it has not been successfully adopted is a fact only too well known to require repetition. Why this should be so it is difficult to explain in a definite manner, but that it is due to differences in the chemical, and especially the organic, characters of the old and modern papers seems to be beyond dispute.

It will be quite well known to the older workers of albumen paper that the acetate bath, after working satisfactorily for weeks, or perhaps months, with the usual necessary attention and additions, would sometimes suddenly go wrong, a fact indicated by its acquiring a purple colour and refusing to tone. This result was usually set down to the introduction of some foreign matter, probably organic, from a bad sample of paper or from insufficient washing; and we have known so apparently simple a matter as the addition of sugar to the sensitising bath—a favourite practice to prevent the paper discolouring in hot weather—produce this disorganizing effect on the toning solution.

Another of the popular toning baths of the present day, the phosphate, was formerly considered as one of the non-keeping solutions, that is to say, it was considered necessary to mix it and use it within a given and limited period of, say, an hour or two. But, as showing the wide departures that are sometimes made from accepted practice, we were surprised, some years ago when paying a visit to one of the branch establishments of a leading firm of provincial photographers, a firm who issued only the highest class of work, to find the printer employed the phosphate bath and used it day after day, strengthening it with fresh gold and, occasionally, phosphate, just before use, and this, moreover, despite the fact that the solution was nearly the colour of claret.

On discussing the question with him, we found that, when working at headquarters, he had never been satisfied with the phosphate bath, even when freshly made, and found it certainly would not keep, but that at the country branch, where they had a well of *very pure and nearly soft water*, the whole aspect of affairs was changed, and the abused phosphate proved superior to anything else.

Some months back certain peculiarities in the behaviour of the phosphate bath, which we were then using, brought these facts back to our mind. We were suffering at the time from the prevailing epidemic—water famine—and our supplies obtained from a strange source were both excessively hard and otherwise impure—so much so, indeed, that the toning bath became badly discoloured long before the process of toning was complete. Moreover, when poured after use into a glass jug, the dense sediment of phosphate of lime that settled down was almost black in colour, and this, coupled with the fact that we had had to use much more than the usual proportion of gold, suggested that there was something in the water that, either alone or in conjunction with the phosphate, threw down a considerable quantity of the precious metal in an entirely useless form.

Acting upon an idea that suggested itself, the next toning bath we mixed was made with distilled water, and while, with the normal quantity of gold, it easily toned more than the usual number of prints, it stood for some days in the vessel into which it was poured after use without the slightest sign of discolouration. This was so contrary to usual experience that we were tempted to use it again, adding a quantity of gold equivalent to that abstracted by the first batch of prints toned. It proved to be as quick and as perfect in action as at first, and on three or four further occasions we employed the same solution, replenishing the gold used, and adding a little more phosphate, until, on the last occasion, it broke down and refused to tone.

The breakdown, however, proved to be only further corroboration of the theory we had been gradually forming that, with thorough washing and pure water, the toning bath for gelatine paper may be used day after day. We had for some little time been using, for washing prints, rain water, or rather *snow* water, of which there was a plentiful supply; but on the last occasion, the Water Company having resumed its duties, and the supply of hard water being more convenient, the prints had been washed with that, with the result mentioned. The washing in each case had been performed with equal care, as we attach the utmost importance to this particular point, so that, unless hard water possesses inferior washing powers to soft, which is not improbable, the effect could only be attributed to the presence of lime and other salts in the prints.

Since that occurrence we have not only adopted the system of using soft water throughout in all operations with prints, but we have made a large number of experiments with different modifications of the toning bath, as well as variations in its management. The result of these trials is such as to convince us beyond doubt that the toning bath for gelatine papers may be used over and over again as successfully as that for albumen. We refrain from saying as easily, because the system

involves a certain amount of care and precaution that may be neglected if the bath is to be thrown into the residue tub when once used, and probably a section of our readers may prefer to adhere to the old style of working. Those, however, who study economy, and, more important, quality of result, will probably take an interest in the description of the methods we have adopted. This we hope to give next week.

Photography with the Shahzada.—Our Afghan visitor is making work for photographers, and he will take back with him a very large number of photographs as mementoes of his visit. He has ordered photographs to be taken of the Queen's state carriages, and some of the horses and their trappings, the splendour of which he was much impressed with on his recent visit to the royal mews. The interest the Shahzada has taken in photography here will, doubtless, act as a stimulus to photography in Afghanistan, where, we believe, it is not exceedingly popular at present.

The Picture Market.—Reference has been made as to the depression in the picture trade, and the difficulty living artists have in disposing of their work. This, however, clearly does not apply to the work of some deceased artists. A week or so back, the collection of the late Mr. James Price was disposed of at auction, and the day's sale realised between 87,000 and 88,000 pounds. A Gainsborough, a portrait, *Lady Musgrave*, realised no less than 10,000 guineas. Fifteen years ago, the same picture was sold for just a tenth of that sum—1000 guineas. A large proportion of the paintings fetched prices from 2000 to 6000 guineas each. This does not look like a very depressed state in the picture business.

Danger to an Observatory.—The observatory on the summit of Ben Nevis had a narrow escape on Wednesday last week, and so did the persons inside it, when it was struck by lightning. It was snowing, and the temperature was at freezing point, when a thunderstorm passed over the district, and lightning entered the building, fusing the telegraph wires, damaging some of the instruments, and stunning one of the observers. It also set fire to the building, the lining of which is composed of wood and felt. Fortunately the staff of observers, assisted by some visitors, were able to extinguish the fire before any very serious mischief was done. The one who was stunned by the shock soon recovered, as he was not seriously injured. Altogether the observatory, and those within it, had a fortunate escape. An observatory, situated as this one is, is not altogether the dwelling that many of us would choose to inhabit.

"A Scientific Investigator."—This calling seems to be, according to a case tried at the Central Criminal Court this day week, to be synonymous with "forger." One Mendel Howard, an American, was charged with the possession of a number of plates, photographic negatives, &c., for the production of forged foreign notes and bonds. The defence was that the prisoner was "a scientific investigator," and that his object was to show the way in which foreign notes could be imitated, in order to guard against forgeries by means which he was experimenting to find out. For his trouble in the investigations he was awarded ten years' penal servitude. By the way, alluding to the forgery of bank notes, the Bank of France is about to issue a new series of notes of the value of one thousand francs. The new note will be printed in four colours, the prevailing ones being red and bistre. It is surmised that the forging of this new note will be an impossiblity, at least by photography.

Process Blocks.—It is said that when anything reaches its zenith it begins to decline. Is this likely to be the case with "process work?" The question suggests itself, inasmuch as process work has, during the past year or two, reached a high degree of perfection, yet some of the best class of illustrated papers seem to be going back to wood-engraving for some of their subjects—portraits above all others—and decidedly to their advantage if the current numbers of some of the illustrated weeklies may be taken as examples. We are alluding to the higher-class ones—the "six-pennies." In the pages of one are some half a dozen portraits all, with one exception, process blocks, the exception being an engraved block, and the contrast is striking to a degree. In other papers are process blocks of groups of persons, and other subjects that, although they convey to an extent a photographic truth, they, as illustrations, are—well, "bad" is scarcely the term to apply. In saying that some of the illustrations convey to *an extent* a photographic truth, even that is so marred by the blotchiness and general smudginess of the impressions as to almost destroy it. This sort of thing will, if it continues, quite justify the rough remarks of the ex-Solicitor-General, Sir Frank Lockwood, at the last Exhibition of the Royal Drawing Society a little while back. Now, there is no question that this general inferiority of work, in most instances, is not due to the blocks themselves, but to the printing and to the paper upon which they are printed, as well as the ink. The finest blocks require the greatest care on the part of the printer, and by many machine men they are looked upon as a nuisance; but that should not be so where such papers as we are referring to are printed. However, the general public, who are the supporters of the illustrateds, do not care by what means the illustrations are produced, but they expect them to be good, and that is not the case with those papers we have before us. So much the worse for the future of process work.

Gelatine Emulsions for the Lippmann Colour Process.—Mr. R. Child Bayley's remarks in our last issue regarding the behaviour of the extremely fine emulsion prepared by MM. Lumière's formula seem to suggest a possibility, which does not appear to have presented itself to him, namely, that the transparency of the emulsion, when it is poured on to the glass, is due to the fact that its constituents have not had sufficient time to enter into combination. It is a well-known fact, with both collodion and gelatine emulsion, that the combination of the silver with the haloid salts is far from instantaneous, the period occupied in complete conversion varying with the viscidity or state of concentration of the vehicle as well as with the character of the gelatine or pyroxyline employed. At the same time the transparency or otherwise of the preparation or of the film it gives can by no means be accepted as an infallible guide as to the extent to which combination has taken place, since so many circumstances combine to produce a more or less granular form of bromide, or a greater or less degree of opacity. We are reminded of an experience we met with in the early days of gelatine emulsion—probably in 1873—which has a direct bearing on this very point. For experimental purposes an emulsion had been made in a very concentrated form, containing something like 80 or 100 grains of gelatine to each ounce, the other ingredients being in like proportion according to the formulæ of the day—that is to say, perhaps, between forty and fifty grains of silver nitrate to the ounce. The extreme viscosity of the gelatine had such an effect in retarding, or rather arresting, combination that, after five or six weeks, during which period the mixture had been several times liquefied it barely passed the opalescent stage, even in bulk, and, when poured upon glass, gave a perfectly transparent film, despite the large proportion of silver it contained. But the remarkable part of the matter was—and it showed incontestably that combination had been arrested—that a portion of the emulsion was submitted to analysis with the extraordinary result that the salts combined in the form of minute particles on the outer side of the septum and in the septum itself, until eventually the latter appeared to be completely blocked, and, when washed and dried after use, was as brittle as a thin section of stone. Another portion washed in the ordinary way gave up its salts, which combined in a more or less coarse condition in the wash water and on the surface of the lumps of gelatine, until these again became impervious to any further penetrative power of the water. The same emulsion diluted to a normal strength immediately became opaque, and subsequently behaved in every way in an ordinary manner. It seems possible that the transparency of MM. Lumière's emulsion film may be due to the fact that, owing to the emulsion being used so soon after mixing, the extremely minute qualities of

soluble salts have not time to combine, and are washed out of the film in the uncombined condition.

JOTTINGS.

An instance of the harm a non-technical journal may be the means of doing is afforded by the extract from *Cassell's Saturday Journal*, which is given on page 379. This supplies an altogether exaggerated and roseate account of the advantages of being a retoucher. I hope some of our retouching friends will read it and let the photographic world have the benefit of their opinions on the matter as expressed by the *Saturday Journal*-ist. "There is," he says, "good money to be made at this business; a clever retoucher can earn his pound a day very easily." Rubbish. He may *earn* it, but he rarely gets it. As to the six to eight shillings per hour, or the steady income ranging from 200*l.* to 500*l.* a year, which seem so easy of attainment, I am open to bet the writer a farthing cake to all Lombard-street that there are not at this moment twenty men in the whole of London earning anything like it. The effect of a foolish and injudicious article of this description is simply to drive a lot of aspiring young women into an already overcrowded profession, and thus to lower wages and quality of work. And God knows there is enough and to spare of both in photography!

My reference a fortnight ago to the newest development of the free-portrait swindle has brought me one or two communications on that deathless theme. Enclosed in one of them is a circular of the Monochrome Portrait Company, of Ealing, offering, besides free portraits, richly engraved aluminium gold watches, to those who recommend and show the Company's "artistic work" to their friends. The gold-watch variation on the old familiar movement has already been mentioned in the pages of the Journal. I have, however, no fear of boring my readers by making a further reference to it, because I am sure I have their sympathy and good wishes in my humble endeavour to induce professional photographers all over the country to prevent the public from having anything to do with these catchpenny dodges.

One gentleman asks me if the mode of operation usually adopted by the free-portrait associations—that is, of getting hold of your photograph and then attempting to extract a preposterously large sum of money from you before making the enlargement or parting with the original—is legal. I am no lawyer; but I fear the law extends its protection even to this as well as to many other kinds of sharp practice that are daily availed of by unscrupulous knights of industry. Still, granting that for one of these framed "free-portrait" enlargements, costing to produce, let us say, 5*s.*, a deluded and dazzled victim is induced to pay 2*l.* 2*s.*, is there any more room or cause for chagrin or disappointment than in the analogous case of a man giving 1*s.* 1½*d.* for a much-advertised box of pills which cost a penny or so to make? Certainly not. But, as only fools buy advertised pills or other quack remedies, so it is only fools that imagine the free-portrait associations exist for the philanthropic purpose of giving away something for nothing. The people I pity are the respectable professional photographers whose businesses are spoilt or swallowed up by the free-portrait shark, whose methods, *if* legal, are not fair, not honest, and not respectable.

"Do I dream—or is visions about?" There was a discussion one evening last month on "Old Time Negative Methods" at the Photographic Society of Philadelphia, in the course of which Mr. William H. Rau called attention to the case of a somewhat remarkable return to an obsolete portrait method. A Chicago photographer, said he, had opened a Daguerreotype gallery, and was making portraits by that process! I wish that Chicago man joy of his gallant attempt to put back the hands of time forty years! Will Mr. Rau, who, I know, is a reader of this Journal, kindly send me a few notes descriptive of his friend's method of working? I shall be much obliged if he will, as I am contemplating booming a Daguerreotype revival, by means of demonstrations of the process, three evenings a week at Cremorne Gardens—I mean the Imperial Institute—a-one-and sixpenny book, and a large stock of piffle and puffery! That Chicago man has fired my ambition to make Daguereotypy the fashionable art for 1896—and leave a crowd of weak-minded gulls of dealers "hung up" with large stocks of unsaleable silvered copper plates, exciting boxes, and other apparatus and material for an absolutely dead process.

Mr. Walter Tyler, of Waterloo-road, London, has kindly sent me a framed photographic group, containing portraits of about a hundred ladies and gentlemen who were his guests at Great Marlow on the occasion of his annual boating party on May 24 last. It is a capital photograph, and will, doubtless, be highly valued by those who were present, in remembrance of a very pleasant outing. All the ladies look nice and all the gentlemen are handsome; and among the latter, it is rumoured, is to be seen "Cosmos." But it is only a rumour, mind; and I give it, as that ingenious Ananias, the London correspondent of a provincial paper, is so fond of saying, under all reserve.

The Exhibition of the Photo Club de Paris, about which there has been some controversial writing both in this Journal and in a contemporary, appears to have been a fairly large one, some 620 photographs, or pictures, or things (choose the term which squares best with your own preferences, dear reader) having been hung. Here is an analysis of the various printing processes employed. The figures, which I merely give for the behoof of those curious in such matters, tell their own tale.

Platinum	169
Bromide	120
Carbon	81
Gelatino and collodio-chloride	33
Artigue paper (carbon)	34
Plain salted silver	34
Collotype	26
Albumen	9
Matt (various)	5
Photogravure	5
Various	4

I may mention that many of the exhibits came from foreigners.

Many of my professional readers are, no doubt, keeping in mind the hint I gave them recently to take up note-paper portraiture, employing half-tone etching or collotype for the purpose. A Paris firm, MM. Chéne & Longuet, are utilising a similar idea. You send them a print, portrait or landscape, and they prepare any desired number of collographic reproductions for you. These are of comparatively small dimensions, say, 2 × 1½ inches, and are gummed on the backs ready for being placed on your visiting cards, your note paper, your love letters, menus, invoices, or any other documents you may be anxious to adorn or illustrate.

This is only a little fish, my friends, but it is worth catching, I assure you. There are numerous little fishes at the mercy of the clever and enterprising professional photographer who is not too proud to angle for them. Take postage-stamp portraits, now. A gentleman writes enclosing a bill of a country photographer who advertises twelve highly enamelled photographs for one shilling, and remarks that "highly enamelled photographs" cannot be obtained for much less! True enough; and yet these twelve little portraits can be produced in capital style and show a profit even at the small price charged for them. I believe that only one negative (about the size of a postage-stamp) is taken, twelve successive, but equal, exposures being made on a piece of smooth bromide paper about quarter-plate size, and the developed print given a surface in the usual way. No retouching, no mount, is given or required.

The official hand-book of the Shrewsbury meeting of the Convention, beginning on July 15 next, is published. A very tempting programme has been arranged, and the "papers," which some people seem, not unreasonably, to shirk at these meetings, look, to judge

from their titles, as if they will be of a more "popular" character than hitherto. I am glad to see the name of Mr. Maskell down on the list, not because (as the Autocrat of the Salon thoroughly well knows) I sympathise with his peculiar "photographic" views, but because I think a programme of this nature should, as far as practicable, be of a varied character, that, in fact, the bill of fare should contain something to suit all tastes. Mr. Maskell's subject is—"Pictorial Photography: the New and the Old." They are mostly "old" photographers that attend the Convention meetings, which will, no doubt, be an additional inducement to Mr. Maskell to go personally to Shrewsbury and allow himself to be jumped on by a horde of savage *f*-64-ites! The Hon. Secretary of the Convention is Mr. R. P. Drage, 95, Blenheim-crescent, W., and the subscription is 5*s*.

Mr. Hector Maclean, F.G.S., is a bold man, but he joins to his boldness a degree of rashness and imprudence which reduces, if even it does not neutralise, the first-named and more desirable quality. In his paper, *A Promising Printing Process* (p. 389), he makes one fact abundantly clear, viz., that he was animated throughout by a fervent and apparently not disinterested desire to exalt collodio-chloride printing paper at the expense of gelatino-chloride. He is no half-hearted or discriminating opponent of gelatino-chloride for printing purposes; not he. He goes the whole animal, and simply damns the process from top to bottom. Thus, to quote Mr. Maclean (who is President of the Croydon Camera Club), gelatino-chloride paper exhibits "a considerable tendency to double tones," "an oftentime unpleasing colour of tone," "a frequent inclination to give hard prints," and, "above all, no reliability can be placed upon the permanency of the image." Then, as gelatine "absorbs water with great avidity, the film freely swells and softens, hence the surface is liable to injury and . . . the soluble matter is not readily removable." Gross over-toning also seems, according to the President of the Camera Club (who is also Mr. Maclean) unavoidable "with the usual result (!!) of an unpleasant, flat, cold appearance." Finally "gelatine has a strong tendency to enter into chemical combination with the salts of silver," which imperfectly known combinations so formed "frequently produce undesirable results." Ma conscience!

I hold no brief for the gelatino-chloride printing process, but I cannot allow Mr. Hector Maclean's reckless rodomontade to pass without a strong protest against its obvious prejudice and utterly random teaching. There is not a single drawback of the many he is at such pains to adduce against the gelatino-chloride process which has not been shown over and over again to be not at all inherent to that process, or most of which cannot with just as much reason be levelled against nearly every other surface-printing method, including, Mr. Maclean may be surprised to know, collodio-chloride. The latter process, of which I am a worker and admirer, can in incompetent hands be made to betray every single manipulative disadvantage of gelatino-chloride, while the physical defects of the two are about evenly balanced. As to the "impermanence" of gelatino-chloride, I have some ten-year-old prints made on such a paper which completely discount Mr. Maclean's unsupported fears. I have no inclination and no time fully to meet Mr. Maclean in his attack on gelatino-chloride, but I will recommend him to turn up to the papers of those three sound and conscientious experimentalists, Mr. Bothamley, Mr. Haddon, and Mr. Grundy, who, if I mistake not, dispose of Mr. Maclean's objections in as complete and convincing a manner as is possible. I wonder, if in the face of the terrible physical and chemical drawbacks with which Mr. Maclean invests a film of gelatine, he is content to use gelatine dry plates?

In regard to the high encomiums Mr. Maclean passes on the Paget Company's collodio-chloride paper, I have no doubt that they are thoroughly well deserved. My own experiences of the Company's glossy collodion paper are of the happiest. But I am quite sure that nothing is to be gained by the unscientific, unpractical, and unfair plan of seeing nought but evil in one process, and everything that is good in another, adopted by Mr. Maclean. It suggests the existence of something more than mere personal preference. Besides, in this case, a vast weight of practical experience and knowledge is in the scale against his objections. So long as photography exists, so long, I suppose, will the battle of the printing papers continue; but let it be fought out on clear and definite lines, and by scientific, or, at least, practical, methods, and not in the absurd and harum-scarum fashion favoured in some parts of Croydon.

It is to be hoped that the members of the Royal Photographic Society will not regard the new premises that have recently been taken for them in any other light than that of a makeshift. They are no improvement on the old rooms at Great Russell-street; they are not even as good, as commodious, or as convenient. At the former place, when the excessive altitude of the suite was disposed of, a homelike sense of comfort was experienced which cannot by any possibility be conjured up at the new place. Formerly the members had the run of a meeting room, library, lavatory, and dark room all communicating; now all that is apparently available is a more or less heavily painted but depressing meeting room—no bigger, no better than the old one, and situated at the rear of an overpoweringly elaborate building of a horsey character in a dismal and distant West-end square.

The library of the Society, which is officially said to consist of more than 1200 volumes, and the museum, which is also said to be "rapidly increasing in value," are no longer on view, being probably packed away in cupboards to which nobody will ever take the trouble to go. In fact, the library, in its generally understood sense, virtually does not exist—that is, if the term "library" implies the existence of a separate reading-room. It is a great pity the Society did not stop where it was. Remembering the oft-expressed members' aspiration of some years ago for the Society's "own premises," it does seem remarkable that the anticipations of the extent to which the "more convenient and commodious suite of rooms" now obtained will be availed of will only require them to be opened between the delightfully aristocratic hours of ten to four! If the only "premises" that in future are to be provided for the use of members is a meeting room, would it not have been better and cheaper to rent a suitable room for a certain number of nights in the year? The present arrangement is repellent and disappointing in the extreme, and can only be commended on the hypothesis that it has been chosen for the express purpose of inducing members not to go near the "rooms" except on meeting nights. In that respect I have no doubt it will be a great and glorious success!

COSMOS.

PHOTO-MEDICAL NOTES ON FORMALIN.

IN the opening article of THE BRITISH JOURNAL OF PHOTOGRAPHY, April 26, 1895, the details and advantages of treating a gelatine dry plate ofter fixation with an aqueous solution of "formic aldehyde" are set forth; but in that article no mention is made of any of the disagreeable results that may occur to the operator from the constant inhalation of the powerful vapour, or from constantly wetting the fingers with the solution of formic aldehyde. At the outset the writer desires to say that he does not mean to be an alarmist, and decry the use of formalin in the photographic laboratory simply because some deleterious effects may result from constantly using it; but, with formalin, as with other active chemical substances, there is a right way to use them and also a wrong way, which, if constantly persisted in, might prove injurious to health.

In perfecting a formalin catgut process, lately published by him,* the writer has, in the past few months, used considerable quantities of formic aldehyde (Merck's) and formalin (Schering), and therefore speaks from the standpoint of personal experience with its use. A brief summary, therefore, of some of its more usual effects on the skin, and a short reference to some of the uses for which it is employed in various scientific laboratories, may prove of service to those who are not acquainted with these facts.

It is now quite well known among microscopists and others that the commercial forty per cent. solution of formic aldehyde is in

* *New York Medical Journal*, April 20, 1894.

requent use in many histological, biological, and bacteriological laboratories as an active and rapid poison for protoplasm, and also as preservative and hardening reagent for animal and vegetable structures, microbes, and cultures of microbes and moulds, specimens of fish, &c. In other words, in substances composed of albumen and gelatine, the albumen and gelatine are coagulated when treated by the vapour or by the solution in water of the gaseous formic aldehyde. The resultant gelatine compound has certainly some very peculiar properties, the most interesting of which—namely, its insolubility in boiling water, even charring from the heat before melting—is, no doubt, pretty widely known throughout the photographic world.

Thus, as stated above, the vapour of formalin even is a most powerful poison to protoplasm, killing and fixing not only microbes, and delicate plant and animal organisms, but likewise kills and fixes the delicate cells lining the nasal cavities and other parts of the respiratory passages when inhaled for any length of time. If the busy photographer, especially he of hot climates, must constantly inhale the vapour readily diffusing from the solution, he will, ere long, become conscious of the fact that the vapour is very irritating to his nose. Sometimes such a large area of these lining cells are killed and fixed by the action of the vapour that ultimately they come away in the form of a thin cast, that resembles, more or less, the shape of the inside of the nose.

Gegner has studied the action of a concentrated solution on the skin, and states that the skin becomes necrotic after more or less prolonged contact with formic aldehyde. After using the diluted solutions, the writer notices that the fingers become shiny and greasy-looking, feeling numb and somewhat as if one had on a rubber finger-tip. After several days considerable desquamation occurs, around the finger nails cracks and fissures are liable to occur, and frequently redness and soreness accompanies them.

Naturally, when one is constantly subjected to and compelled to breathe more or less of this powerful vapour, unless due precautions are taken, a more or less continual annihilation of numbers of the delicate cells lining the air passages will occur, and probably will result ultimately in seriously disturbing the proper healthy condition of membranes lining the throat and nose. We shall not, however, particularise further on these resulting imflammatory disturbances, as it would lead us deeper into the domain of medicine than we intend to go in these "Notes."

After a personal experience with formic aldehyde, used photographically and otherwise, the following precautions should always, in the writer's opinion, be taken, especially by those who intend to frequently employ formic aldehyde for photographic purposes.

There should be plenty of fresh air circulating in the work room, and the dishes containing the solutions should be kept tightly covered with a properly fitting cover, in order to prevent as much of the poisonous vapour as possible from escaping into the room. Lastly, when great numbers of the plates are treated with the hot or boiling water, it should be done in a vitrine or other cabinet, ventilated directly into the open air. Such elaborate precautions are, of course, necessary only when great numbers of plates are so treated, and on such occasions that would necessitate the worker's continuous presence for a considerable period of time in an atmosphere more or less filled with the powerful vapour of formalin. In order to protect the hands, rubber finger-tips had better be used.

R. H. CUNNINGHAM.

PHOTO-MECHANICAL NOTES.

WHILST great progress has been made of late in methods of transferring the photographic image to metal, and forming it into a resist for etching, it will be generally agreed that, in the matter of the etching, no astonishing discovery has been made, nor any notable improvement instituted in existing methods. Whether there is scope for advance in this direction is a matter about which most process workers have probably not thought it worth while to trouble about, whilst they have been absorbed in the problem of manipulating the screen, and mastering the peculiarities of the enameline process. For my own part, I am inclined to the opinion that a careful investigation into the methods of etching would reveal some weak points, and probably suggest important changes.

The mordant for etching zinc generally in vogue is simply nitric acid in various degrees of dilution. Commercial nitric of specific gravity 1·440, or thereabouts, is commonly employed, and the quantity used by London etching firms alone must be, comparatively speaking, enormous. In fact I cannot call to mind any other trade in which anything like the quantity of commercial nitric is used. The retail price is about 2¼*d.* per pound, buying by the carboy, or the more popular half carboy, which latter contains about seventy pounds weight of acid. By every one, from the manufacturer down to the boys in the etching room, the handling of the acid is regarded as a disagreeable necessity. It cannot be of any great profit to the manufacturer when it has to be retailed at such a low price as I have indicated, and considering the trouble of delivering it. In London the manufacturer must deliver it at the door at the consumer; indeed, his carman is too often compelled to carry it right into the etching room, perhaps up a rickety staircase. If the acid has to be sent by rail, the companies put every difficulty in the way. The carboys must be delivered and placed on the train at a particularly defined goods station, possibly some way out of London, A minimum charge of 5*s.* for carriage is made, and the company takes no responsibility whatever; in fact, if the carboy leaks in any way, it may be promptly put off the train, and may never reach its destination. The carboys can only be sent by the "danger train," which runs on certain days of the week, and, as they have to be put on the train, they cannot be delivered except at the stated time notified by the company. At the other end the consignee must collect the carboy himself, he may even be compelled to take it off the train. Possibly these rigorous stipulations are not in all cases insisted upon, but so far as my experience goes they are, as a rule.

Apart from these difficulties connected with obtaining the acid, there is the constant danger of accidents in the etching room. Spills and breakages are not infrequent, and acid burns on hands and arms are quite common, often requiring hospital treatment. Where the floor of the etching room has been laid for the purpose, a spill is not of much moment, but an ordinary wooden floor is very soon penetrated, with disastrous results to any room below. It is no good throwing water on the spilt acid, and sawdust only makes it fume the more. A big sponge well charged with water may remove some of the worst effects, and whiting or plaster from the walls or ceiling will kill it as effectually as anything. An open bottle of ammonia will neutralise the fumes to some extent, without the ammonia itself proving unpleasant. It would be far better, however, if precautions were taken when the etching room is fitted up. If the floor is a wooden one, it is cheapest to caulk and pitch it if there is liberty to do so. If not, a good plan is to lay matchboarding over it, and do the caulking and pitching on that, afterwards throwing down plenty of sand to overcome the stickiness of the pitch. Substantial linoleum is a good thing, better even than lead, which the acid will get through in time. A few good coats of paint are an alternative. A self-starting acid syphon with stop cock is an effective provision against accidents arising when getting out the acid. Not the least of troubles which proprietors of photo-etching firms have to deal with, resulting from the use of acid, are those arising from damage to drain pipes, when of lead, zinc, and iron. In many cases have firms been compelled to put down, at their own expense, earthenware drain pipes, perhaps from the top of a tall building. I hope I shall not be considered an alarmist if I mention a very grave danger, too often neglected and in most cases probably not even suspected. In hot weather or in a hot room there is a risk with nearly full carboys, if tightly stoppered, of a burst through the expansion of the pent-up gas under the influence of the heat. Happily such an accident is extremely rare, and is provided for by the manufacturer using loosely fitting earthenware stoppers, tapered so that they cannot jam, and only held down in transit by a luting of plaster of Paris. The gas could easily blow off with these stoppers, and etchers are to be cautioned against replacing them with anything more tightly fitting.

The danger to health arising from the continued breathing of the acid fumes is perhaps the least thought of, yet old etchers know very well how serious are its effects on the teeth, lungs, and eyes. It has lately been suggested that the fumes might be killed by placing strips of copper in the etching trough. This idea may prove to have a different application, for, as the trouble in etching zinc is the formation of bubbles of hydrogen on the surface, rendering it necessary to rock the bath, it occurs to me that advantage might be taken of the electrical attraction of copper for hydrogen. The copper (which is electro-negative to the zinc) attracts the electro-positive hydrogen, and would thus effect a continuous liberation of the gas. It is merely an idea which occurs to me as I write, and I give the hint for what it is worth.

In the face of such troubles attendant on the use of nitric acid, it may be assumed that the provision of some substitute of a less dangerous character would be distinctly welcome. Whilst, however, all acids attack zinc more or less, the choice of suitable mordants is somewhat limited, for the two most vigorous etching acids next to nitric are even worse to handle, and would not give any advantage over the nitric acid. It is true, though, that both sulphuric and

hydrochloric are at present used by experienced etchers for deep etching, either alone or in combination with nitric acid, but in any case, of course, considerably diluted. They can only be used when the resist is very strong and resinous, as they attack the grease in the ink vigorously. It has been suggested to use hydrochloric acid in ten per cent. solution, with two per cent. of chlorate of potash added. Here it is, no doubt, assumed that the addition of the chlorate would be to take advantage of the chemical activity of chlorine, which depends on its affinity for hydrogen, and its power of oxidation, the result of that affinity. Another suggestion is to add thirty per cent. sulphuric acid to a ten per cent. solution of potassium nitrate; but, as the result of this would be to set free nitric acid, it is difficult to see where the advantage would come in, yet it is claimed that with this mordant it would not be necessary to rock the bath.

A more promising, and indeed practicable, mordant is pyroligneous acid, and an etching fluid has been formed with it in conjunction with nitric acid and chloride of ammonia (sal ammoniac). In some few studios in England and on the Continent, this fluid, which is known as "still" acid is much used. The etching trough does not need to be rocked, and the etching is singularly free from undercutting. At present, those etching firms who use it have to make it themselves, which involves considerable trouble, as it has to stand in tubs out in the open air for some time, to "brew," so to speak. Probably, if it became a commercial article, it would be very popular.

The suggestion has been repeatedly made to perform the operation of etching by electric action, and, though this seems reasonable enough in theory, it does not work well in practice, at least so far as zinc is concerned. Up to a certain point, that is to say, so long as the etching is not wanted very deep, the battery will perform the etching very neatly, but in greater depth the undercutting is just as marked as in ordinary etching. It is necessary that the current should be weak, otherwise the hydrogen bubbles form on the zinc, and eat through the resist, causing rottenness. I have etched half-tones very well by means of a Daniel's cell, the wire from the copper pole being attached to the zinc plate, which was suspended in a separate trough, whilst the conducting wire from the other pole dipped about an inch into the acid. The etching took 1½ to 2 hours, so there was no advantage in the matter of speed, but the etching was very clean.

There are several methods of etching in which advantage is taken of the fact that certain acids will only attack certain metals, so that, if a zinc plate is covered in parts with a deposit of metal which cannot be attacked by the acid used for biting the zinc, the desired object will be attained. Thus it will be found that, if zinc is covered in parts with metallic deposit by precipitation from the salts of various metals, it will only be bitten by nitric acid in the parts left uncovered; yet, curiously, on the contrary, dilute sulphuric, hydrochloric, acetic, and other acids will bite it in parts covered by the other metals. A promising process of this kind was suggested by Mr. Warnerke some years ago. If I remember rightly—without having recourse to reference—he found that, if a polished zinc plate was written upon with an acid-resisting ink, or if a greasy transfer was put down upon it, and then upon the bare parts of the zinc, a metallic deposit—preferably from a solution of ammonia sulphate of nickel—was made, the parts so deposited upon could be bitten with dilute hydrochloric acid. The etching was very sharp and clean, and possibly it would be worth while resuscitating this interesting process. Akin to this method was that of Captain Abney, in which the uncovered parts of a zinc plate were deposited on with a ten-grain solution of sulphate of copper. The plate was then etched with very dilute acid—one part in 500—which attacked the parts covered by the copper. The fluid had to be rocked, and the etching took about twenty minutes. The plate was then washed and inked, dusted and coppered again, and then etched with acid twice as strong, the operation being repeated as often as may be necessary. In trying this process some years ago, I remember never being able to get what I considered a sufficient depth.

A careful study of etching methods would, I think, indicate some new lines in photo-engraving, and the object of the foregoing somewhat cursory notes is to stimulate thoughtful workers towards that end. It may, of course, be argued that the adoption of copper etching with perchloride of iron would be the easiest course, but zinc has proved so valuable a servant in process work, and is at the same time so cheap, that it seems hardly right to drop it without carefully estimating its possibilities.

WILLIAM GAMBLE.

DRY PLATES FOR PROCESS WORK.

[Anthony's Bulletin.]

THE photo-engraver has for many years ridiculed the idea of using dry plates, or any modification of them, for the production of negatives for line and half-tone engraving; and, indeed when one considers the quality of a negative necessary for this work, it is not to be marvelled at that the engraver views any radical change in his methods with scepticism.

The first point to be considered, of course, is as to whether there is any necessity for a change, that is, whether the adoption of gelatine plates brings with it sufficient advantages to warrant the laying aside of the materials and methods that have for so many years been employed. On this point one cannot but recall the change from wet to dry plates for view and portrait photography, and we feel that, if with the ordinary photographer there were sufficient inducements to warrant the practical exclusion of wet plates and the universal adoption of dry plates, the same causes that led to such a change are worth considering here.

We will not enter into any discussion as to the relative merits of negatives that have been made on wet and dry plates, but will say that it is conceded that the wants of photographers are best met by the dry plate, and that the principal causes that led to the change were: (1st) the fact that dry plates could be purchased ready for use; (2nd) the general simplification of the methods and materials; (3rd) the cleanliness of dry-plate as compared with wet-plate work; (4th) the rapidity of the dry plate and consequent saving of time and labour.

Now, all these considerations apply equally to the photo-engraver. Instead of purchasing the glass and many materials necessary, and being harassed by troubles with silver bath and collodion, he can, with such plates as we are referring to, rely upon obtaining a perfectly uniform article The only materials necessary are the developers usually employed for dry-plate work, and of these we will speak later. With regard to cleanliness, there is no reason why the hands should be stained at all with the pyro developer, and the odour of collodion and the staining of the silver nitrate are entirely done away with. Again, the saving of wear and tear in the holders is no small item. Those who have seen a wet-plate holder, after a year's service, must have noticed how rotten it is from the action of the nitrate of silver on the wood and metal parts. Again, there will be no necessity for the use of silver in the making of the holder. These holders have always been expensive because of this, and there is no reason why an ordinary holder, made of wood, with the metal parts of brass, should not be efficient.

Perhaps the most important consideration is the rapidity of working with the dry-process plate. Time is saved, first, because plates have not to be prepared; and, secondly actual experiment has shown us that, where with the wet plate an exposure of five to six minutes was necessary, under precisely the same conditions a properly exposed dry plate was obtained in from forty to fifty seconds. As regards the item of expense, we do not think that, when all points are taken into consideration, there will be any balance in favour of the wet plate. When one remembers that plates have to be cleaned, silver bath and collodion prepared and attended to, and the various little but yet important details that are well known to every engraver, the great advantage in a plate ready for use and cleanly in every way will be apparent. Finally, in this connexion, we would say that we would assure engravers that just as good results can be obtained on the dry as on the wet plate, and that there is no good and sufficient reason why the use of dry plates for the production of negatives for engraving should not become universal.

It must, of course, be borne in mind that these plates are much more sensitive than the ordinary wet plate, therefore the engraver must replace his well-illuminated dark room with a room lighted only by ruby light. In fact, these plates must receive as much care with regard to exposure to light as is given to the ordinary quick plates used in landscape work. On taking out one of these plates and examining it by the red light, it will be hard to tell at first which side is coated, so fine and free from grain is the emulsion. However, by pinching one corner of the plate between the moistened thumb and finger, the coated side can easily be recognised; or, if one finds out first how the plates are packed, all trouble will be obviated. Indeed, when these plates are examined in daylight, the extraordinary freedom of the coating from grain is very noticeable. The procedure is practically the same as in making a copy on an ordinary dry plate. The plate is placed in the holder in position and exposed to the object, the reversal being obtained by means of a prism. Development yields a rich olive-brown negative, with absolutely clear glass.

The following formula is an old and well-tried one with these plates and will be found to give, with properly exposed plates, negatives that are of such character as to be ready for use without intensification:—

No. 1.

Sulphite of soda	4 ounces.

Pyro	1 ounce.
Sulphuric acid	15 drops.
Water	20 ounces.

No. 2.

Carbonate of soda (gran.)	4 ounces.
Water	20 ,,

In order to get density, a smaller proportion of alkali is used, and the mixture we have found to answer best for line negatives is, No. 1, 1 ounce; No. 2, ½ ounce; water, 1½ ounces; and ¼ of a dram of a 12-grains-to-the-ounce solution of potassium bromide. The image should develop slowly, and should be under control. However, the plate will not fog under any circumstances in this developer.

After development, wash in water, and fix in the usual solution of hyposulphite of soda. If the developer is used repeatedly, it will be found necessary to clear the plates with a mixture of hydrochloric acid, ½ ounce; water, 20 ounces. For half-tone work the prism is almost universally used, thus dispensing with the stripping of the film. The addition of the prism increases the exposure about ten to fifteen seconds, but, when one remembers that the stripping of the film is dispensed with, this is by no means an obstacle.

SOMERSET:

The Land of Foliage, Flowers, and Ferns.

With a hard-earned fortnight for rest, a needed holiday, and strong desire to take the camera, necessitating at once the selection of suitable surroundings—and I asked Where? A deep problem. "A dear little, picturesque, quiet corner!" Where? Old recollections flashed across my mind—a picture by H. Manfield, "*At Bossington*," many "Pall Malls" ago—a most likely corner. Maps gave no Bossington. *A B C's* and *Bradshaw's* made no record of so small a portion of England's geography, and Bossington, with cottage and thatch, I failed to identify. It must be Devon; and the ever-useful every-day Almanac gave me a Bristol Society, and I wrote the Hon. Secretary. (Poor Secretary!) He helped me, as he must do. It's always safe to scold and *demand* from an Hon. Secretary; they are not built as ordinary mortals, and must do as you wish! Well, with his obliging nature fortune favoured me. A well-known worker sent all particulars, including a carefully penned ordnance inch map, with villages marked with positions for likely pictures. So much trouble for one, a total stranger, was so kind an act that to give his name publicity would mean the most ungrateful return I could ever pay him. This is one only of many instances of the happy, helpful Masonic understanding that exists among photographic brethren. And so Minehead proved to be the nearest rail destination. At the station I found a very accommodating 'bus waiting. In choice of conveyance one is somewhat limited. The Lorna Doone coach swiftly passes you on the road, and turns off at Porlock proper, *en route* for Lynmouth and Lynton. Still, lovers of nature have no strong desire to travel through such lanes and roads as these at express speed, that the slowly going pair-horse 'bus goes quite, if not too fast for any comrade of the camera. Surroundings all new, beautiful, and novel; coming down steep hills, as it were on the very roofs of the white cottages, such shapes and forms, all new and strange, that we appeared to be moving much too fast. We slipped gently through Porlock, and saw the Post Office, which sells legs of mutton and halfpenny postage stamps nearly together, and almost over the same counter.

The most picturesque cottage a fastidious mind could create sold and repaired shoes, while another, quite as nice and near, "let out donkeys." And on we went, passing the ever-quaint *Ship Inn*, and trotted into Porlock Weir, snugly sheltered by high rising hills of forest trees on one side, and open, sweeping bay on the other, with now the evening sun lighting up the cliffs of Cardiff on the opposite side.

Here, miles from anywhere, and nothing to buy, no shops, and but a wall pillar-box to post your letters—should you run out of stamps, it may be necessary to commission the postman to fetch a supply, with a day's interval, as you get one delivery only. Nothing beyond quietness, fresh air, and delightful walks can be got here. Household requisites must, of necessity, be ordered some time in advance, and an initial quantity ordered or taken. To depend wholly upon the hotel would be risky, especially if near the stag-hunting in August.

A letter to the Postmaster at Porlock secured my little family a comfortable position facing the sea, and a convenient one for securing from the bedroom window bold effects of light and sky.

Making this spot your headquarters, you are thoroughly crowded and surrounded with work for the camera. Working a fair day, and taking a five-mile radius, good pictures could not be exhausted within a holiday of a fortnight. A snap-shot man or perpetuity of roller films are purposely omitted in this estimate, while the free use of winding off and beating records can also be generally enjoyed with a variety that is at once charming. But the man who has a spot of limit and some fixed idea of contentment has more than he can do in the time.

To enumerate spots would be difficult, and to describe the scenery more so. Bossington, as a village, is, in itself, quite a stage picture. Cottages overgrown with flowers running to the very summit brick of the chimney; its trickling trout-stream through the one street, alive with cackling ducks and quarrelling drakes. Here I notice a small, low cottage, quite smothered by a huge walnut tree, and as the checkered sunlight plays through its boughs, casting many crooked shadows, slowly comes along the returning worker. Pushing the slung basket from his shoulder he quietly peeps unobserved into the low lattice window to soon bring forth a joyous laugh, and instantly an open door, with affectionate welcome from the wife and bairns. Happy, quiet Bossington! Noisy, head-aching London. One all peace and rest; the other strikes, murders, and politics.

Selworthy on no account should be missed. The almshouses, in which Sir Thomas Acland locates some of his old servants, are situated on the Green, and are very pretty, and form graceful pictures with the aged folks carefully posed in the porches. The merest tyro must here make happy results with such material.

Luccombe is worth a hard tramp to secure its groupings of cottages and profusion of roses, with the ever characteristic walnut trees. Here I could find but one small shop; on entering, I found on the counter, conveniently placed, a small hand bell, with which to announce my presence. Waiting a few minutes, the owner appears, seemingly from some distance, and most obliging. On presenting a shilling to pay the cost of glass of milk, had to receive my difference of change in all small copper money with much mildew, obtained from somewhere down two steps at the back, and counted out singly, dividing his attention between my general appearance and countable value of that he was slowly paying out, and, as it seemed, regretfully parting with. Had I tendered him gold, the remainder of my holiday might have been spent in his shop!

The woods are really wonderful. Ferns grow in thick variety and in every possible and impossible position and place; ferns of the smallest and most delicate of feather and form to the bold and of huge dimensions.

Horner woods, every little distance, give the camera golden opportunities, with rustic bridges over running streams, all prettily set in a natural frame of young trees lending themselves just nicely to every requirement; and so villages, each having a special feature, could be named, the whole forming too long a list for our purpose. To the man with either camera or easel, wanting "bits" of true English scenery, comprising queer old homes, quaint bridges, grand foliage, open land or seascapes, with figures always in keeping with its surroundings; and, further, if he desire to take rest with a holiday away from clatter and tumult of a busy city, to go and do as he may please unrestrained by form of fashion, then let him not for one moment hesitate, but pack traps and try "Zummerzet."

Tom Coan.

OLD-TIME NEGATIVE PROCESSES.

[Photographic Society of Philadelphia.]

At a meeting of the Photographic Society of Philadelphia, January 9, 1895, your attention was called to the subject of "Old-time Negatives and How they were Made," but owing to the want of time only the wet-plate process was described, leaving the consideration of dry-plate negatives for another evening.

In the early days of the wet-collodion process, before reliable dry plates came into use, it was necessary to carry a portable dark room into the field and finish the work on the spot, which required the use of a quantity of chemicals and the treatment described in the previous lecture.

Thirty-five years ago dry plates were prepared by the wet-collodion process or by the use of albumen. In either case the collodion or albumen was used for holding the sensitising salts. The manipulation required for the preparation of dry-collodion plates was practically the same for all processes, the first part of the process, viz., the sensitising of the collodion in the nitrate of silver bath and afterwards getting rid of the free silver solution on the plate by repeated washings, first in distilled and afterwards in ordinary water, being common to all, a preservative, as it was called, being afterwards applied, its object being to fill the pores of the wet-collodion film with a suitable substance, which being afterwards washed out from the dried film previous to development, left the film somewhat in the same condition as the original wet film, and enabling the developer to act upon it in a similar manner. It was this organifier or preservative which gave the name to the particular process used, and hence the terms "tannin, malt, coffee, resin, beer, gallic acid, milk, albumen, tea," as applied, simply indicated that one of these preservatives had been used in the preparation of the plate. It is not to be supposed that the result in the finished negative was the same, whatever preservative was selected. On the contrary, each one gave marked qualities peculiar to itself, and consequently each one had its adherents as being *the* process, provoking just as much discussion and rivalry as exists in the use of the various commercial plates of to-day.

In the albumen process "pure and simple," the treatment was practically the same, the iodising or sensitising salts being held in solution in the albumen instead of collodion, the plate being coated with the iodised

albumen, which required very delicate manipulation, as the plate had first to be accurately levelled and the albumen applied by pouring on a small "pool" in the centre of the plate, guiding it with a glass rod to the edge, draining off the surplus, and, when set, drying afterwards by gentle heat. The plate was then made sensitive in the nitrate of silver bath, and afterwards treated as the collodion dry plate, with this exception, that gallic acid was almost exclusively used as a preservative. There was so much care required in the preparation of these plates, owing to the "tacky" nature of the albumen—dust or any floating particles collecting on the surface making the resulting negative anything but satisfactory—that a modification of it was introduced by Colonel Taupenot, in which, instead of flowing the albumen on the plate as before described, the plate was first coated with collodion, and, after sensitising and washing, was covered with the albumen, as I will hereafter describe. And in this case the whole manipulation was rendered very much less difficult, there being little danger from defects caused by dust, &c., as these substances would sink through the albumen and find a resting-place in the porous collodion film below. The application of the iodised albumen was much more readily accomplished, as, the collodion substratum or film being moist from the washing, the albumen could be flowed over the plate with great ease. The sensitising of the collodion film previous to the application of albumen was not absolutely necessary. A plate coated with plain collodion and simply washed until the ether lines disappeared, and then coated with the albumen, would answer as far as facility in coating was concerned equally as well as Colonel Taupenot's process, but it is beyond question that the iodide of silver in the collodion, formed by the nitrate bath, not only helped to reinforce the darks of the finished negative (the developer working through and acting on the iodide), but the opacity and yellow colour of the film prevented anything like back reflections from the plate or blurring in the high lights. And to-day these plates will hold their own as far as maintaining the detail and soft tones of the high lights under the most prolonged exposure against any "backed" or double-coated plate of the present time.

The next variation in the preparation of dry plates was the introduction by Messrs. Sayce and Bolton, of the Liverpool Photographic Society, of the *collodio-bromide* plate. In this process, instead of forming the sensitive iodide or bromide of silver by immersion of the salted collodion in a nitrate of silver solution, as in the processes before described, this intermediate step was omitted, and the nitrate of silver in due proportion was added (in alcohol solution) to the collodion containing the requisite quantity of bromide and an emulsion formed (a principle similar to the present method of making gelatine dry plate), and the plates coated with this, afterwards washed to remove free salts. As there was usually an excess of bromide, the plate was finally coated with one of the before-mentioned preservatives and dried. These plates being composed entirely of bromide of silver required "backing" to prevent halation. They were fairly sensitive for those days, and established and maintained a good reputation for many years.

About the year 1876 *washed collodion emulsion* came into use. It was essentially the old "collodio-bromide," with the modification that the emulsion instead of having the free salts extracted by washing, after coating the plate and a preservative applied, the emulsion was washed by proper methods, and the preservative or organifier added as well. It was then only necessary to coat the plate with this emulsion, and when dry it was ready for exposure, no treatment after coating being necessary. This reduced the labour of preparing plates to a minimum, and excellent results were obtained in many cases. However, it was liable to develop "spots." Their origin being difficult to trace and a remedy hard to find, some enterprising experimenters prepared their own silver emulsion, but a large number purchased their supply from stock dealers. While upon the subject of washed emulsion, credit should be given to two of the members of this Society, Mr. Lewis T. Young and Mr. D. A. Partridge, who were able to place in the hands of photographers a most reliable article.

For many years the rivalry among these old processes continued, and many a hard battle was fought to demonstrate the superiority of some pet process until the advent of the commercial gelatine plate caused a cessation of hostilities. A truce was declared, the old dipping baths, collodion bottles, drying racks, &c., were placed on the retired list, and the war now wages between rival gelatine plates and what constitutes the best method of developing them.

To give some idea of the dry-plate process in use about 1860–61–62–63–64–65, mention will be made of a few of them.

Malt.—Mix 7 ounces well-bruised malt in 24 ounces hot water, keeping the temperature from 155° to 158°; place the pot containing the infusion before a moderate fire for half an hour, allowing the temperature to fall to 138°, and the solution has acquired a sweetish taste; remove some distance from the fire and cool slowly for two or three hours, stirring frequently; filter. The solution should be quite fluid, and of the colour of pale sherry. Use a fluid collodion. Excite in a bath of 35 grains nitrate of siver to each ounce of water. Neutral. Wash off all the free silver under the tap, until the greasy appearance disappears; drain for a few moments on a pad of thick blotting-paper. Before the film begins to dry, pour over it the malt solution; wipe the back of the plate and dry by artificial heat.

To sensitise, place the exposed plate in a dish of water for a few minutes, then dip in a bath of nitrate of silver 25 grains, water 1 ounce. Develop with iron or pyro and ammonia.

Milk.—Take 20 grains of condensed milk to each ounce of water: dissolve, filter, and pour over the collodionised plate. Same developer as malt.

Tannin.—Use an old sample of red collodion, nitrate of silver bath, 45 grains silver to each ounce water, acidified by 3 drops of glacial acetic acid. When the plate is sensitised, wash in a number of dipping baths containing distilled water. If little washing is done, the plates will be more sensitive, but will not keep. Then drop in a bath of tannin 15 grains, water 1 ounce, which has been filtered carefully. Dry by artificial heat. Developer, pyro, citric acid, and silver.

Coffee.—To make preservative: Take 1 teaspoonful of ground coffee, add to it ½ pint boiling water; allow the mixture to stand for 10 minutes, filter, and use cold. A little sugar was often used in the solution with good results.

Tanno-Gallic Preservative.

Water	1 ounce.
Tannin	10 grains.
Gum arabic	6 ,,
White sugar	4 ,,

Mix together, and add 1 drachm of a 24-grain solution of gallic acid dissolved in alcohol.

Albumen.—Red collodion, acid nitrate bath 40 grains strong: sensitise. Wash in water until oily lines disappear. Preservative:—

Albumen (Ackland's)	1 ounce.
Water	3 ounces.
Ammonia	3 drops.

Filter and pour over the sensitive plate; drain, and apply a second time. After the second application wash the plate under a tap. Then flow with—

Nitrate of silver	30 grains.
Glacial acetic acid	15 drops.
Water	1 ounce.

Let this solution soak into the film for a few minutes, then wash off and dry. Exposure, four times wet.

These plates will keep for two weeks. If, before drying, the plate is flowed with a 3-grain solution of gallic acid to each ounce of water, they will remain in good condition for years.

Develop with pyro and carbonate of ammonia; strengthen with pyro and silver.

Taupenot Albumen Process.—Albumenise the glass, old red collodion, sensitise in silver bath, 45 grains to each ounce of water; wash thoroughly in water and place in a 10-grain solution of salt and water. Wash in water, drain, and flow with iodised albumen, made as fallows:—

Whites of 10 eggs, concentrated ammonia, ½ drachm; dissolve 60 grains iodide of ammonia, 10 grains bromide of ammonia, in 2 ounces water; add to the albumen, and beat with a wooden spoon to a stiff froth; let it settle for one night, and pour off the albumen for use. Let the first application run off the plate, flow again, drain, and dry. Plates in this condition are insensitive to light, and will keep any length of time. Up to this point all the operations can be conducted in white light. To sensitise:—

Nitrate of silver	45 grains.
Water	1 ounce.

To each ounce of solution add ½ drachm of glacial acetic acid. Dip the prepared plate in this bath for not more than one minute. Wash well in water, and dip in a 10-grain solution bromide of potassium; wash under the tap for one-half a minute, drain, and pour over the plate a 3-grain solution gallic acid to each ounce of water. Dry without much heat.

Development.—Wet the plate with water; flow with a 3-grain solution of pyro to each ounce of water until the shadows appear, then add a drop or two of citric acid and silver solution, which will give the proper density. These plates can also be developed with alkaline pyro, and density given after detail is out with acid silver solution and pyro.

Fix in Hypo.—In this process the albumen being coagulated in the nitrate bath, the film becomes very hard, and if carefully handled no varnish is necessary.

The Gum Gallic Process was probably the most rapid of the dry-collodion bath plates, especially if the collodion was highly bromised and a strong nitrate bath used. In this case, and when *freshly* made, these plates were quite as sensitive as the wet process on a well-lighted subject alkaline developer being used. This process, up to the application of the preservative, was similar in its manipulation to those before mentioned, the preservative being composed of—

Gallic acid	3 grains.
Gum arabic	20 ,,
White sugar	10 ,,
Water	1 ounce.

In all photographic work the proper cleaning of the glass is a matter of the greatest importance. Glass as it came from the dealers was first examined for imperfections, scratches, bubbles, &c. The edges were ground until smooth, then placed in a dish containing nitric acid, or, in later years, bichromate of potash and sulphuric acid. After soaking

several days the plates were washed thoroughly in running water and placed on a rack to dry, after which each glass was cleaned by hand—in fact, polished, like the "buffing" of a Daguerreotype plate, but even with this preparation the film would often become detached and the negative spoiled. To overcome this difficulty a solution of benzole and India rubber was appplied to the edges before or after coating with collodion. This answered fairly well until a dilute solution of albumen in water was tried. This simple preparation prevented any slipping of the film, and was a precious boon to both wet and dry-plate photographers.

JOHN C. BROWN.

Our Editorial Table.

EDER'S JAHRBUCH FÜR PHOTOGRAPHIE UND REPRODUCTIONSTECHNIK, 1895.

Halle-a-S.: Wilhelm Knapp.

THIS well-known annual is to hand again. Besides containing many specially contributed articles by well-known experimentalists, it has the usual well synopsised *précis* of photographic advances and progress during 1894. There are also numerous examples of the various processes of photographic illustration.

THE "GEM" DRY PLATES.

THE "Gem" Dry Plate Co., of 92, Villiers-road, Willesden Green, N.W., has sent us, for trial, samples of the plates they are issuing. These are of two rapidities, the "Universal" for portrait and process negatives, the "Meteor" for shutter work. The first-named plate is of medium speed, and gives bright, sparkling, and plucky images admirably suited to the purposes assigned. The "Meteor" for rapid work is a charming plate to use, yielding an exquisite quality of image under brief exposures, with no tendency to veil in development. Judging their productions by the samples sent, the Company are much to be congratulated on the preparation of plates of perfect qualities—clean, flawless, and easy to work, which deserve to be popular. We may add, that we employed pyro-soda in their development, which appears admirably suited to them.

News and Notes.

NOTICE OF REMOVAL.—Messrs. B. G. Lennon & Co. write: "Please take notice that after the 22nd inst. our address will be 75, Leadenhall-street, London, E.C."

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.—In future the meetings of this Association will he held at the Raglan Hotel, 61, St. Martin's-le-Grand, E.C., a few doors from the General Post Office.

A SUICIDE'S OPINION OF PHOTOGRAPHY AS A PROFESSION.—After a financial worry, John C. Challicom, photographer, of Terrett's-place, Upper-street, Islington, swallowed poison. He left a letter stating that he had lost his situation through illness, and asking if any benevolent person would use influence to get his son a fair start in life and help his wife. The letter continued: "Son has strong desire to engineering or mechanical trade. He has a knowledge of book-keeping, Pitman's shorthand, and writes plain hand. Do not let parents put their sons to photography to get their livelihood. I give much praise to my plucky wife, and, if I had her courage, should have succeeded better." The jury returned a verdict of suicide during temporary insanity."—*The Star.*

PATENTS IN 1894.—The twelfth report of the Comptroller-General of Patents, dealing with the year 1894, has just been issued. During the year the office received the enormous number of 25,386 applications for patents, and received the large sum of 181,855*l.* Whether more inventions of value are patented than were included in the 5000 or 6000 annually registered before the change of the law in 1883, is perhaps a doubtful question. The percentage of patents sealed has fallen considerably of recent years. Of the 1893 applications, only 47 per cent. became valid patents. Ten years ago the percentage was 58. Before the 1883 Act, the percentage was 65. The percentage of patents kept in force by payment of renewal fees also shows a steady decline. Only 30 per cent. survive the first period, and only 6 per cent. last to the fourteenth year. Of the total number of applications, 19,180 come from the United Kingdom, 6206 from abroad. The United States send the largest number, 2017; then comes Germany, with 1945; then France, with 799. Of the Colonies, Canada sends 141, Victoria 79. The following places have each produced a single invention since 1883:—British Honduras, Fiji, St. Helena, Malay Peninsula, West Africa, Madeira, Réunion, and New Caledonia. The number of female inventors is not as large as might have been expected: 2 per cent., and a fifth of their inventions relate to dress. The series of classified abridgments of specifications appears hardly up to date, though seventeen volumes were issued in 1894, for none of these deal with inventions of a later date than 1883. During the year, 21,230 designs were sent in for registration, and 1025 "sets" of designs. There were 8013 applications for the registration of trade marks.—*Journal of the Society of Arts.*

THE Committee of the Photographic Salon, 1895, announce that the third annual Exhibition of the Salon will open at the Dudley Gallery, Piccadilly, on Monday, September 30, and remain open till November 2 following. Further particulars and entry forms may be obtained on application to the Hon. Secretary at the Dudley Gallery, Egyptian Hall, Piccadilly. The latest dates for receiving pictures for submission to the Committee of Selection will be from September 1 to 6 at the agents', and on Tuesday, September 17 (without packing-cases), at the gallery.

THE YERKES OBSERVATORY.—The construction of the building at Lake Geneva is now advancing rapidly, and it is hoped that the 40-inch telescope will be ready for use in September or October. The form of the building is that of a Roman cross, with three domes and a meridian room at the extremities. The long axis of the cross lies east and west, with the dome for the 40-inch telescope at the western end. This dome, for which the contract has been awarded to Warner & Swasey, is 90 feet in diameter. As the tube of the 40-inch telescope is 62 feet long, there will be plenty of space for a solar spectroscope 9 feet long and a dew cap of about equal length. The shutter opening is 12 feet wide. Adjustable canvas curtains will be provided to shield the telescope from the wind. Warner & Swasey have also been awarded the contract for the rising floor. It is 75 feet in diameter, and will have a vertical motion of 22 feet. Both the floor and dome will be moved by electric motors. Of the two smaller domes, the one to the north-east will contain the 12-inch telescope now at the Kenwood Observatory, and the other a 16-inch telescope. Between these domes is the heliostat room, 100 feet long by 12 feet wide. The heliostat will stand on a pier at the north end of the room, under an iron roof which can be rolled away to the south. The meridian room has double sheet-iron walls, with an intervening air space. The room is designed to contain a meridian circle of large aperture, but for the present a transit instrument will suffice for the purposes of the Observatory. The body of the building is divided through the centre by a hallway extending from the meridian room to the great tower. On either side are offices and computing rooms, a library, lecture room, spectroscopic laboratory, optical room, dark room, developing room, galvanometer room, chemical laboratory, instrument rooms, &c. In the basement is a large photographic dark room, an enlarging room, concave grating room, emulsion room, constant-temperature room, and physical laboratory. The building is constructed of grey Roman brick, with grey terra-cotta and stone trimmings. It is situated in the midst of a large tract of land on the shores of Lake Geneva, Wisconsin (about 75 miles from Chicago), at an elevation of 180 feet above the lake. The architect is Mr. Henry Ives Cobb, of Chicago. The engines, dynamos, and boilers for supplying power and heat are to be at a distance of several hundred feet from the Observatory.—*The Astro-physical Journal.*

THE following letter recently appeared in the pages of a Glasgow contemporary:—"A New Hazard in Golf. Sir,—As a spectator of the play in the golf championship this week, allow me to lodge my humble protest against the ubiquitous snap-shotter. It is not too much to say that the course on Wednesday and Thursday was simply crawling with those strange creatures. The most harmless form is the man with the little box who lurks in the rear of the famous player, and seizes every opportunity of getting him in an undignified position. 'Do you know,' whispered an excitable little stranger to me on one of the greens yesterday, 'I have just had a splendid shot at John Ball, who was playing out of that big bunker. Back view,' he added regretfully, 'but, of course, not for publication.' But, sir, it is not of these that I write to complain. They are the humbler creatures of their kind, and do little real harm. But what shall we say of the more important photographic gentry who at every second hole guarded the approach—sometimes three at a time—with enormous cameras perched in the most aggravating positions, and insisted on spoiling many a good put by the irritating 'snap' of their instruments? It is not too much to say, sir, that they constituted a species of new hazard, which it will be the bounden duty of the Royal and Ancient shortly to consider, and, if possible, to bring within the rules. Knowing, however, how slow of motion that august body is wont to be, I hasten to suggest, through the medium of your columns, a few changes of obvious expediency. A hazard shall be any bunker of whatever nature—water, sand, &c.—*or photographers and their appliances*, &c. When a ball lies in or touches a hazard, the player shall not sole his club, *except in the case of the photographer, on whose person he may sole it as often as he pleases, without penalty. If a ball strike or touch a photographer or his appurtenances, the player will be permitted to rub the photographer on the green; or, if there be a bunker near, he may take him and drop him over his shoulder into the bunker, without loss of a stroke.* A hole shall be 4½ inches in diameter, and at least 4 inches deep; *but holes knocked in photographers and their appliances are not so limited.* Any movement of the club which is intended to strike a photographer is *not* a stroke. Before striking at the ball the player shall not break anything near the ball, *unless it consist of photographic cameras and such apparatus.* Photographers getting in the line of play may be subjected to any number of penalty strokes. In such cases, a player, besides calling in the aid of his partner and caddie, may appeal for assistance to his opponents and theirs. A few new rules in such lines as I have sketched would, I am sure, conduce to a vast improvement in the conditions of play.—I am, &c., ST. ANDREWS VETERAN."

THE DEVELOPMENT OF FILM NEGATIVES.—On several occasions we have been induced to inquire into the cause of certain defects in rollable film negatives which have been referred to us for explanation. The faults alluded to have been erratic inequalities of density, patchiness of image, and irregular markings. The seekers after truth and Kodak beauty have ascribed these failures to unequal coating, want of flatness of film during exposure, and to any other cause but the right one. It may interest and help some other fellow-workers with the "Traveller's Friend," to record what the real fault and cause of the mischief proved in several cases to be. *It was simply the use of too small a quantity of developer.* This cause of trouble may be very stale teaching to many, but we are sure it should be one of the first points of friendly instruction in our *Kodak News.* Photographers more accustomed to the development of glass plates, with a minimum quantity of solution, are liable to overlook the need for altering their practice on this point to suit the different

circumstances of film photography. They may take great pains in many matters to have everything exact and reliable, and yet miss the one most important point of all in the new procedure. A large quantity of solution in developing rollable film negatives is, under ordinary circumstances, an essential. In the dim light of the dark room, errors of estimation are easily made, and a film may not be so well covered as the operator imagines. Attention may flag for a moment and the mischief may be done. Even a slight kink or curve of the film, apparently well under the developer, may be a possible source of evil. The simple remedy or precautionary procedure is to use full measure of solution, and to keep the film negative moving—not violently and spasmodically, but gently and continuously. No, it need not be an extravagant plan. Our own method is to cut off about half-a-dozen film exposures, and, having prepared about two inches depth of solution in a deep dish, develop them in that with very much the same treatment as is adopted in toning silver prints, namely, by passing them in rotation one over the other. With a succession of fairly regular exposures we have developed forty-eight exposures at one sitting in this way, with the addition of only a small quantity of fresh developer. But this is very much a matter of the developer used, and the remark, as made, refers actually to eikonogen and to hydroquinone development. With pyro we should prepare fresh developer after about a dozen films had been completed. Some workers may object that they like to develop each film exposure separately, and to them we would say that almost all the advantages of separate development would be gained by preparing two dishes of developer and a dish of bromide solution, one developer very energetic and the other the normal one used. With these at hand, appearances and changes in the image may be promptly dealt with in the usual manner. But, even when using only *one* dish of fairly energetic developer (the strength most generally suited for hand-camera exposures), there is no necessity to despair of negatives where the image greys over somewhat rapidly. Beginners are apt to be misled by this rapid appearance and fogged look, and they remove the negative immediately from the developer. This is the exact opposite of what should be done. Such cases should be treated by longer development until everything seems blocked up. By this means printing density relations are secured, even though the printing may be tedious in consequence. But this properly belongs to another topic.—*The Kodak News.*

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 11,821.—"Improvements in Means for facilitating the Separation of Gelatine Coatings from Paper Supports in the Manufacture of Photographic Films." J. B. B. Wellington.—*Dated June*, 1895.

No. 11,937.—"Improvements in the Production of Photographic Enlargements." A. A. Barratt and A. J. E. Hill.—*Dated June*, 1895.

No. 11,953.—"Improvements in Photo-mechanical Printing." A. B. Chatwood.—*Dated June*, 1895.

No. 11,973.—"Improvements in Lights and Reflectors for Photography by Electric and other Lamps." C. B. Crawshaw and R. Kennedy.—*Dated June*, 1895.

No. 12,047.—"An Improved Method of Changing Photographic Plates or Films." A. Millar.—*Dated June*, 1895.

PATENTS COMPLETED.

Improvements in Photographic Printing Frames.

No. 14,376. Charles Ambrose McEvoy, 69, Victoria-street, Westminster. *May* 24, 1895.

According to this invention, a photographic printing frame is formed of two frames hinged together at one side so that they may be closed together like the leaves of a book. The central opening of one frame is to receive the glass plate negative, the other the paper on which the print is to be made. Over the inner face of each frame is fixed a thin metal plate with an opening through it of somewhat smaller dimensions than the opening through the frame itself, so that the thin metal plate projects slightly beyond the sides of the opening through the frame. The glass plate is dropped into the opening of one frame from the back, and is pressed by springs up to the rim of thin sheet metal which is around the edge of the opening. The paper is dropped into the opening of the other frame from the back, and its edges similarly rest on the thin sheet metal rim which is around the opening of this frame. A wooden plate faced with soft elastic material is dropped into the opening on to the paper, and is pressed down on to it by spring catches, so causing the edges of the paper to be held between the soft facing and the projecting rim of thin sheet metal. The two frames are then closed together, and held closed by a suitable catch. In this way the paper is held by the soft elastic material behind it against the face of the glass negative, and is ready to be exposed to light for printing. The advantage of constructing printing frames in this way is that the frame can at any time be opened, and the progress of the printing at once seen, the whole face of the paper being exposed to view when the printing frame is opened, instead of, as in the ordinary frames, half of the paper having to be turned back and inspected, and afterwards, when this half has been replaced, the other half inspected. If, when the printing frame has been opened, the printing has not progressed sufficiently, the frame can be again closed, and the paper be so again brought accurately into position below the glass negative to be again exposed to light.

The wooden plate may be held down on to the paper by a curved spring catch or catches, such as used in ordinary frames, the spring turning on a pin at one side of the back of the frame, and sprung under an arm fixed to the other side, the central portion of the spring then bearing upon the back of the wooden plate. The glass may be held by springs made to bear upon one edge of thin wooden strips, which at their opposite edge bear against the back of the glass along its side edges.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
1	North Middlesex	
1	Peterborough	
1	Putney	
1	Richmond	
1	South London	*The Camera and its Adjustments, Exposure, and Development.* Messrs. Boyce and Dickinson.
1	Stereoscopic Club	
2	Birmingham Photo. Society	
2	Brixton and Clapham	*Our Photographic Failures.*
2	Exeter	
2	Gospel Oak	*Photographic Failures and their Possible Remedies.*
2	Hackney	
2	Herefordshire	
2	Lewes	
2	North London	
2	Oxford Photo. Society	
2	Paisley	
2	Rochester	
2	Rotherham	
2	Sheffield Photo. Society	
2	York	
3	Leytonstone	
3	Photographic Club	
3	Southport	
3	Southsea	
4	Birmingham Photo. Society	
4	Glossop Dale	
4	Hull	
4	London and Provincial	
4	Oldham	Excursion: Bakewell for Haddon Hall and Chatsworth. Leader, J. S. Dronsfield.
4	Tunbridge Wells	
5	Brighton and Sussex	
5	Cardiff	
5	Croydon Microscopical	Conversational Meeting, and Results of the June Excursions.
5	Holborn	
5	Leamington	
5	Maidstone	
5	North Kent	
6	Croydon Microscopical	Excursion: Groombridge Place, Rusthall Common, and Tunbridge Wells. Leader, J. H. Baldock.
6	Hull	
6	Liverpool Amateur	Excursion: Hebden Bridge. Leader, Mr. Marriott.
6	Newton Heath	Exc.: Prestbury. Leader, J. Fortune.
6	North Middlesex	Excursion: Pinner for Ruislip.
6	Putney	Excursion: Weybridge.
6	South London	Exc.: Hatfield. Leader, Mr. Oakden.

ROYAL PHOTOGRAPHIC SOCIETY.

June 25,—Technical Meeting,—the Earl of Crawford in the chair.

Mr. James Wilson exhibited the Vedette dark slide, an arrangement of a double dark slide by which each side of the slide carried three plates.

The Chairman said a somewhat similar arrangement had been used by Lawrance in a camera made by him some three years ago, but the ingenious adaptation to a dark slide seemed to be a novel one to him.

Mr. J. Packham gave a demonstration of his process of toning platinum prints by the aid of catechu.

The Chairman asked what error of temperature might be allowed each side of 120° Fahr.

Mr. Packham said it was largely a question of time. By the cold process clearer whites were obtained.

Mr. Chapman Jones said that he could not get any colour when iron was not present, and invariably got it when iron was present; moreover, the colour behaved in the same way as the iron salt. He himself could not eliminate the whole of the iron with hydrochloric acid.

Mr. Hearson said a crucial experiment would be an attempt to tone sketches made with iron and platinum compounds respectively.

Mr. Clifton asked if Mr. Chapman Jones had tried if catechu would react with platinum black.

Mr. Chapman Jones said *no.*

Mr. Thomas said he had been able to get prints with whites as clear as he wished.

Mr. Marchant asked Mr. Packham if he had been able to prevent the fading of the coloured prints in sunlight.

Mr. Packham made a brief reply upon the points raised.

Mr. C. E. Hearson exhibited a printing frame which consisted of two frames hinged together, one holding the negative and the other the sensitive paper. The entire print can be seen when required during the printing.

Next meeting at 5a, Pall Mall East, on October 12.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 20,—Mr. T. E. Freshwater, F.R.M.S., in the chair.

SPIRIT PHOTOGRAPHS: SHOULD THEY COMMAND BELIEF?

Mr. P. EVERITT read a paper on the subject, in the course of which he dwelt on the reluctance of spiritualists to join photographers in experimenting with reference to spirit photography. He characterised the condition of "receptivity" usually laid down as empty parade, and asked who was more likely to be deceived than he who lent a willing ear? Quoting Hume's argument against miracles, namely that they were a violation of the laws of nature, he said he thought that argument applied in this case. There were certain conditions, such as the action of light or electricity and certain chemicals under which a photograph would result and others in which it would not result. Was it, he asked, reasonable to accept the evidence of the people who took these photographs? There was a gigantic assumption that the supplementary figures in these photographs were the emanations of living bodies, that the spirits of the departed communicated with the living, and impressed themselves on the photographic plate. What evidence was there in support of that theory? He called upon the spiritualists to demonstrate the connexion of the photograph with the spirit, to produce the concrete things and show how the one invariably preceded the other, in fact, to demonstrate the existence of the spirits and to produce photographs of them on isolated plates. The onus of proof, concluded Mr. Everitt, laid with the spiritualists.

Mr. J. A. HARRISON said years ago he had tried experiments with the view of ascertaining whether he could produce spirit photographs, but was unsuccessful, his lack of success being ascribed to the "opposition" of persons in the neighbourhood.

Mr. A. L. HENDERSON was of opinion that there was "something in it"—meaning spirit photography. He, at considerable length, gave an account of several remarkable spiritualistic phenomena (unconnected with photography) that he had witnessed, and, having stated that he had undergone "development" which would qualify him to be a spirit photographer, he handed the Hon. Secretary an old copy of *The Medium and Daybreak*, from which Mr. Everitt read a lengthy account detailing how Mr. Henderson had obtained a number of so-called spirit photographs on wet plates for the edification of a Mr. Rippon. Although Mr. Henderson did not expressly state so much, it was understood that these were not "genuine" spirit photographs.

Mr. R. BECKETT, in allusion to some spirit photographs that had been shown, pointed out that the "spirits" were lit from one side and the material sitters from the other. The whole thing was not "good enough" for him, and he asked what good had these photographs done?

A lady visitor bore testimony to the remarkable psychic qualities possessed by Mrs. Everitt, a lady whom Mr. Henderson had mentioned.

Mr. E. H. BAYSTON asked Mr. Henderson if he had produced spirit photographs on dry plates?

Mr. HENDERSON replied that he had not, but it would be much easier to do so on dry plates than wet plates.

A gentleman visitor inquired if there was any conclusive evidence that spirit photographs had not been taken?

Mr. E. J. WALL referred to a book by Miss Houghton, in which there were several so-called spirit photographs. Most of the spirits were lighted from opposite sides to those of the sitters. In one photograph a gentleman was depicted with whiskers and moustaches; the same gentleman appeared in another photograph as the spirit. Mr. Wall went on to refer to a book which was illustrated with "spirit" pictures, some of which had been proved to have been pirated, hence the spirits were no respecters of Copyright Acts.

Mr. A. MACKIE asked whether any one had seen a spirit photograph of an inanimate object. He asked the question because the frontispiece of a book on spirit photography, which purported to be a spirit photograph, was a reproduction of the well-known bust of Clytie.

Several members appeared to be of opinion that a test *séance*, at which a small committee of the London and Provincial Photographic Association should be present, should be held.

The CHAIRMAN was of opinion that some so-called spirit photographs that had been shown were fraudulent.

Mr. SMITH (a visitor) was undecided as to whether to call it fraud or self-delusion—he gave it up. He suggested, however, that, as the telescope, in conjunction with the gelatine dry plate, enabled stellar bodies to be photographed which could not be seen by the eye, therefore spirits in a room, which could not be seen by the eye, might also be seen by the sensitive plate.

Mr. W. E. DEBENHAM, in reply to this theory, pointed out that the photo-telescope was equatorially mounted, and that the dry plate, by means of long exposure, stored up impressions which the eye did not see.

The CHAIRMAN here remarked that stellar photography was of more recent introduction than "spirit" photography.

Mr. WALL also said that the retina of the eye tired of an impression, whereas the photographic plate did not.

Mr. EVERITT, who was accorded a hearty vote of thanks, replied to the discussion, and briefly restated his position, which was, that it remained for the spiritualists to prove the existence of the link between the object and the manifestation. At present there was no evidence in support of that assumption.

MANCHESTER PHOTOGRAPHIC SOCIETY.

MEETING held Thursday, June 13, at 36, George-street,—Mr. A. Brothers, F.R.A.S. (Vice-President), in the chair.

Mr. R. G. Jones was elected a member.

Mr. A. E. Casson exhibited a carefully prepared series of negatives and prints of flowers and chromo-lithographs, demonstrating the power of photographic plates prepared specially for the better rendering of colour values, and clearly proved his contention that they possessed the qualities claimed for them, and for such work much superior to the ordinary plate.

Mr. H. M. Whitefield was unable to be present, but sent negatives and prints arriving at the same conclusion.

Mr. J. Wood had undertaken to show that ordinary photographic plates suitably treated in exposure and development, would give results little, if any inferior to the specially prepared plates. Unfortunately for his side of the question, he also was unable to be present at the meeting, and the negatives sent by him were not considered a satisfactory proof of his argument.

At the close of the discussion, it was unanimously agreed that the subject and examples shown were deserving of attention at another meeting, when the attendance of members would not be interfered with by the holidays.

Mr. WOOD reported on the outdoor meeting held at Disley on Saturday, May 18, when over twenty members and friends were present, and 150 plates were exposed. It was a great disappointment that, owing to a misunderstanding with the agent of Lyme Hall, the party were unable to photograph the interior.

At the next meeting, a comparison of various lenses used for hand-camera work relative to their covering and defining powers, working at apertures *f*-8 and *f*-11, will be undertaken by several members, also prints and negatives of recent exposures will be shown.

Brixton and Clapham Camera Club.—Tuesday, June 18.—At this meeting Dr. J. Reynolds (President) occupied the chair for the last time, and, in taking an official farewell, sketched the history of the Club during the three years he has held office, expressing the hope and the opinion that the Club would continue to progress, not only in the numerical sense, but in the artistic, scientific, and social directions also. The meeting tendered their warmest thanks for his past services, coupled with an expression of their sincere regret at his retirement. Mr. J. W. Coade (Vice-President, and one of the founders of the Club) was then elected President. Two ladies and two gentlemen gave in their names as intending members. The programme included a demonstration of carbon printing by Messrs. C. F. Archer and F. W. Levett, both prints and transparencies being developed to show the adaptability of this process to various decorative purposes.

Croydon Camera Club.—The apogee of the Club's photographic field work for the present season was attained on the 22nd inst., when the President (Mr. Hector Maclean) conducted a party to Broadham Green and Coltsford Mill. A large number of unusually promising subjects were met with, including several arrangements of figures performing various duties connected with the making, carrying, and stacking of hay; the grouping of the above, so as to yield pictorial effects, was in most cases effected by Mr. Maclean, who also suggested and advised respecting most of the other subjects, mainly old picturesque cottages and mill-ponds. Tea at the Hoskins Arms terminated a thoroughly well-enjoyed outing, during which fifty photographs were secured. A special extra excursion will leave East Croydon at 1.58 on Saturday, the 29th, for Shere, in charge of Mr. A. Hirst, who has particular knowledge of the above charming district.

South London Photographic Society.—June 24.—The first of what may be considered a series of social evenings connected with this Society was held on Monday, the 17th inst., at the Hanover Hall, Hanover Park, Peckham, S.E., when a large contingent of members and their friends were present. The chair was occupied by the Hon. Assistant Secretary (Mr. A. E. Allen), and a number of excellent songs were given, among which may be mentioned: "Stars of Normandy," by Miss Harper; "The Flight of Ages" and "The Promise of Life," by Miss Williams; and "Across the Desert," by Mr. Williams. Mr. and Miss Welford added considerably to the variety in their selections with the Japanese violin, autoharp, and fairy bells, and Mr. Welford's plantation song called forth loud applause. Mr. A. E. Allen rendered "Father O'Flynn," and as an encore "The Powder Monkey." The recitation of Mr. Utley, "Me and Bill," was well received, as also the remarks of Mr. C. E. Fortune. The comic element was well sustained by Mr. F. Milner in his "Gallery and Boxes" and "After the Show;" also by Mr. French in his stagey "Do, Ra, Mi, Fa." Miss French and Miss Dickinson ably presided at the piano. A very pleasant evening closed with a hearty vote of thanks to the artists for their services, and to the Committee for having at so short a notice provided such an excellent programme.

Darwen Photographic Association.—On Saturday, June 22, this Association made a camera excursion to Burnley, leaving Darwen by the 1.43 train, and arriving at Burnley at 2.30 p.m. The beautiful afternoon was a great inducement to the photographer to take advantage and join the excursion, and a good muster of enthusiastic workers journeyed to Burnley to find work for the camera. The first place of interest chosen was Townley Hall, a very antique-looking place with its ivy-grown walls, now in the possession of Lady O'Hagan, daughter of the late Colonel Charles Townley, whose ancestors, since the date of its erection in the fourteenth century, have found shelter within its walls. A number of plates were exposed here, and then, by the aid of a Burnley gentleman appointed as leader, wound our way to Barcroft Hall (Spencer House), which is supposed, and, by the careful studies of Mr. Abram, of Blackburn, has almost been proved to satisfaction, that this was once the dwelling-place of the great poet, Spencer. The next which came within the radius of the excursion was Worsthorn Hall, of which but little information was obtained, so the journey was continued until we reached the house of Mr. Wilkinson, of Swinden, where a good, old-fashioned ham-and-egg tea, provided for the occasion, was done justice to, after a tramp of nine miles, accompanied by our old friend the camera. The excursion was brought to a close after a walk of five miles to the station with an hour to accomplish it in.

FORTHCOMING EXHIBITION.

1895.		
June 29–July 6	*Agricultural Hall.	W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

To the EDITOR.

SIR,—I have been in communication with the railway companies for some time past as to reducing the rates for return fares to Shrewsbury from all parts of their lines.

I regret to say that their final decision holds out no hope of there being any specified reduction. Members, however, who can arrange to travel in parties of ten or more may be able to procure return tickets at one fare and a quarter by applying the day before or early on the morning of starting. Arrangements made in this manner by Mr. W. D. Welford, of 59, Chancery-lane, have been carried out very successfully in former years.

The special fast trains on both lines, leaving London on Saturday morning, July 13, returning on July 20 and 22, at 14*s.* return, will be found very convenient.—I am, yours, &c.,

R. P. DRAGE, *Hon. Secretary.*

To the EDITOR.

SIR,—Your well-timed leader of June 14 has drawn attention to a matter which we feel only requires clearly explaining, so far as the local Committee is concerned, to disperse, once and for all, a cloud which at present appears to hang over the future of the Convention.

An idea has got abroad that the brilliant functions at Dublin last year are to be repeated at Shrewsbury, and it has even been said that "public money has been voted" for this purpose. In flatly contradicting this report, the latter part of which is absurd on the face of it, we wish to add that it is quite out of our power to emulate Dublin, and, further, we have been clearly led to understand that nothing of the kind is expected of us.

What we have done has been to work hard at completing an excursion programme and other necessary details which we have every confidence in anticipating will be found, at least, to equal those of any previous meeting.

It would be impossible for the London secretary to arrange such details without local aid, and the future well-being of the Convention depends upon some such aid being forthcoming. When it is clearly understood that nothing further than this is really required, we anticipate that there will be no lack of invitations from societies desirous of the honour of a visit from the Convention,—I am, yours, &c.,

FREDERICK W. WILLIAMS,
Chairman Local Executive Committee.
MARTIN J. HARDING,
Shropshire Camera Club, June 24 1895. *Local Hon. Sec.*

"CASMOS" AND THE N.A.P.P. SUMMER EXCURSION.

To the EDITOR.

SIR,—In reply to our kind friend "Cosmos" (see THE BRITISH JOURNAL OF PHOTOGRAPHY, June 14), I am glad to say his wish has been fulfilled. The excursion has *resulted in a large attendance and a pleasant time.* I can assure him that it was *not* a *hole-and-corner outing* in any sense, and that, if we had had the special advantage of his company, he would have withdrawn that unmerited phrase which he applied to the N.A.P.P. of a *misanthropic body.* We have never been guilty of *self-isolation,* nor do we *perpetuate hostile feelings between various classes of photographers (amateurs and professionals.)*

In proof of my refutation of the harsh remarks of "Cosmos," and of some other isolated remarks in the photographic press, I beg to say that members of our Association have attended the various meetings of the Convention, and others will attend the Convention this year. On one occasion the President, Mr. T. Fall, went from London to the Edinburgh Convention, accompanied by Mr. H. J. Whitlock, from Birmingham, and other members of the N.A.P.P., all remaining the week in Edinburgh, of course paying all expenses themselves; I was also present officially. We found that, as a means of advancing the interests of the Association, the outlay of time and money was of little use. The Convention is a large gathering of miscellaneous people, mostly interested in photography, and their friends; in fact, a five days' "outing" for any one who likes to purchase a ticket, and can afford a week's time, and the needful cash. It is, therefore, a pleasant "outing" for professional photographers, who are able and willing to indulge in it. But, beyond that, it is of little actual service to the "professional;" and it is not very entertaining for him to spend so large a time in listening to discussions, and the reading of papers, upon subjects which, if he is up to his work and a skilled practical man, are all A B C to him long ago. These papers and discussions, and the taking of portraits, groups, and shots, are all highly entertaining to the amateurs and their friends, but cannot possibly be of such vital interest to the professional.

The Convention is also, mainly, a "happy hunting-ground" for dealers and manufacturers to advertise their goods, and to introduce the last novelties to crowds of admiring amateurs, with money in their pockets, and a perpetual thirst for acquiring scientific knowledge, and also for purchasing all sorts of instruments and contrivances (patented or otherwise) which manufacturers are constantly producing for the welfare of mankind and themselves.

I may add, with all possible respect to the members of the N.A.P.P., that it is only a limited number who are able and willing to go in for the week of "delightful dissipation" provided by the Convention; our Association, be it remembered, includes all "grades" in the profession, and is not solely made up of the "Big guns," although we have several of the latter amongst us.

It is an entire delusion for any one to imagine that we are opposed in any way to the "amateurs," our first President, Mr. H. J. Whitlock, his Treasurer, Mr. T. Fall, and now Mr. W. Barry, as well as the leading members, have always, by precept and practice, inculcated one lesson—viz., "Be on good terms with your amateur customers and friends; render them all fair and legitimate assistance; induce them to come to your studios and bring their friends; show them how good and skilful your work is; get sittings and orders from them; in fact, *make money out of them!*" Mr. Fall's paper, read at one of our annual meetings in London, entered into this matter fully, and showed how all this can be done by a skilled photographer, who had tact, good temper, and a determination to get well paid for his work. The unfair advantages granted by dealers and manufacturers to persons outside the "profession" is quite another question.

Returning to the "Summer Excursion." It was not suggested, in any way, as opposed to, or competition with, the Convention! but simply a quiet humble little outing, at a moderate cost, for one, two, three, or more days, wherein professional brethren, members of the N.A.P.P., and their ladies, might have some pleasurable enjoyment and a more intimate acquaintance with the glories of nature and the art-world, and yet be free to talk "shop," and give or receive professional information of use all round, and to be at peace with all men, especially "Cosmos."—I am, yours, &c., D. J. O'NEILL, *Secretary, N.A.P.P.*

47, *Charlotte-road, Birmingham, June* 22, 1895.

EXTEMPORISED DRY-PLATE MAKING.

To the EDITOR.

SIR,—Your article entitled "Extemporised Dry-plate Making," in your May 24 issue, suggested to me the following train of thought. A rapid dry plate is the result of, in most cases, years of thought and experience.

The most rapid emulsions are brought so near to the fog line that it requires great skill and experience to keep them from crossing over, and being sentenced to be regenerated by the refiner.

The best of plate-makers of to-day are showered with blessings (?) by the photographer; but what would be the result should he place his emulsion in the hands of the photographer to coat and dry, and to be compared with one finished at the factory?

Photographer remarks, very gently, "That miserable, mealy-faced emulsion-maker coats all his best emulsion at the factory, and then cheats us poor photographers by selling us emulsion that will give nothing but fog, pinholes, bubbles, pits, rings, streaks, drying and coating marks, &c. I'll write him a letter telling him what I think of him."

In conclusion I would say, Please have pity on the poor dry plate, and "lead him not into temptation, but deliver him from evil," and by so doing you will greatly oblige,—Yours, &c., MILTON B. PUNNETT,

St. Louis, Mo., U.S.A., *Chemist M. A. Seed Dry Plate Co.*
June 7, 1895.

STRIPPING GELATINE PRINTS.

To the EDITOR.

SIR,—On reading my latest copy of the JOURNAL (May 17), I see an article upon *Glossy Papers,* and am induced to send you by this post a couple of transparencies, which are made by transferring P.O.P. prints after finishing. I have been experimenting with this paper, and have obtained beautiful results in the above direction. The specimens sent are not indicative of the best that can be done, as you will understand. I am at present away from my headquarters, and have to work in a tent, where the dust renders good work in this line impossible. I have, however, sent better specimens to the Ilford Company; if I can get them to send them to your office, I should like your opinion upon the process. I think, myself, that exquisite slides for an oil lantern can be made in this way, while its possibilities are great in the way of transfers to any material or surface, window transparencies, ditto for making enlarged negatives, and for making reversed negatives by contact for photo-mechanical work. I think also that photographic enamels (or what, I think, are called "ceramics") can be made with the striped films. The convenience of being able to print out, put in skies, tone to any desired colour, trim, &c., before the transferring is done, must be great. On reading Mr. J. K. Tulloch's article in the same number, I fancy I have dropped across a method for making slides for the lantern that fully meets his requirements.

I am only as yet in the experimental stage, and, moreover, have been obliged to content myself with old negative glasses which are badly

scratched. This, plus dust and a score other inconveniences, prevent my making a good job of the transfers. I hope to be able to send you something better later, but your wide experience will enable you to judge from the two now sent as to the possibilities of my method.—I am, yours, &c.,

Clyde House, Jubbulpore, C. P., June 4, 1895. H. HANDS.

P.S.—Referring to P.O.P., I may say I use it for *all* my own work, and have found a method of treating it *before toning* that prevents film getting soft, and can dry it between blotting-paper.

"AUTOTYPE NOTES."

THE PHOTOGRAPHIC PROFESSION AND COMPETITION: RETRACTATION AND APOLOGY.

To the EDITOR.

SIR,—In our issue of June 1, under the above heading, we made a statement with reference to Messrs. Elliott & Son, in which we imputed to them that they had departed from an honourable business understanding with reference to price-lists for enlargements.

We are satisfied that Messrs. Elliott & Son are perfectly innocent of what we imputed to them, and we have the greatest satisfaction in entirely withdrawing every statement made in our issue of June 1 in any way imputing to them unfair or dishonourable conduct, and have to express most sincere regret for having caused them any annoyance by the publication of our notes on that subject. W. S. BIRD.

June, 1895. CHARLES SAWYER.

SUMMER PHOTOGRAPHIC EXHIBITION.

To the EDITOR.

SIR,—The above Exhibition will duly open its doors at the Agricultural Hall on Saturday next, the 29th inst., and I should like to call the attention of attending visitors to the fact that it will not be located in the Arcade Galleries, as announced, but on the ground floor of the Hall itself, where I have secured a handsome and ample space. To give some idea of the internationality of the Exhibition, I give the following list of entries from other countries:—

AMERICA.—Post, Eidemiller, Thurber, Tooth, Fairman, Ferguson, De Vos, Dadis, Poundstone, Felix, Beam, Coutant, Bracklow, Wilms, Schriever, Balster.
AUSTRALIA.—Bradford, Bullock, Boseley, Czarlinske, Scott.
AUSTRIA.—Hafner, Paspa.
CANADA.—Wilson.
DENMARK.—Udsden, Stockholm.
GERMANY.—Zehnder, Nieport, Julius & Rieperhoff.
HOLLAND.—Genderingen.
INDIA.—Maennig.
ITALY.—Boon, Belotti, Retzold.
NEW ZEALAND.—Campbell, Stewart, Denton, Gifford, Iles.
SOUTH AFRICA.—Cape Town Society, Hancox, Harding, Steer, Rayner, Logeman, Smith, Stott.
SPAIN.—Alexander, Gillman.
SWEDEN.—Thorburn.
SWITZERLAND.—Du Bois, Buri, Gilli.

I have many letters from distant parts regretting that the time allowed was too short, and this will be remedied on a future occasion.—I am, yours, &c., WALTER D. WELFORD, *General Manager*.

June 24, 1895.

AQUARIUM PHOTOGRAPHIC EXHIBITION.

To the EDITOR.

SIR,—Will you allow me to inform your readers that amongst the competitions that will be held in connexion with the above Exhibition will be one for societies. Medals and diplomas will be given for the best displays made by any of the recognised Photographic associations. The space available for the exhibits is comparatively large, and societies need not therefore hesitate to send in a large collection. I would also draw the attention of professional photographers to the class for portraiture, for which special awards will be given.—I am, yours, &c.,

E. A. DU PLAT.

Royal Aquarium and Summer and Winter Garden Society, Limited, Westminster, London, S.W., June 24, 1895.

EXHIBITION AT LEEDS.

To the EDITOR.

SIR,—It will probably interest you to know that the Corporation of the City of Leeds are holding an Exhibition in October next, in the City Art Gallery, when the following sections will be represented:—

1. Pure Photography.
2. Drawings suitable for reproduction by photo-mechanical process.
3. Reproductions by such process.

The splendid salons of the City Art Gallery will be used, the Exhibition being organized by the Art Gallery Committee of the Corporation of the City of Leeds, with the assistance of Messrs. J. H. Walker, F. Savage, H. Denison, and W. J. Warren, representatives of the Leeds Photographic Society.—I am, yours, &c., W. J. WARREN, *Secretary*.

61, *Albion-street, Leeds, June* 25, 1895.

"THE NOTORIOUS DR. MORWAY."

To the EDITOR.

SIR,—Yet another scene in the play (which has its tragic side, as well as the "padding" of comedy), in which the central figure has many "quick changes" of costume and name, and is almost ubiquitous, being heard of in Hull, anon in Cork, and even, as stated in a recent issue of your paper, in France, besides many towns all over the kingdom. In the interests of society at large, business houses and private ladies in particular, it is necesary to publish broadcast the fame or infamy of Dr. Morgan, Captain Morgan, Captain Morway, Dr. Morway, Comte de Hallenburg (with a string of fictitious titles). He is at present in Cork, charged with defrauding hotel-keepers and obtaining money under false pretences. He is stated to be under promise of marriage to several ladies, having obtained from some (at least one, to my knowledge) money. Asking the favour of publicity to the matter,—I am, yours, &c., J. B.

Glasgow, June 20, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

A polished walnut glass case, having spring roller blind and plate-glass front, five feet high by two feet five inches wide, and five and a half inches deep, weather-proof, cost 7*l.* 10*s.*; also optical lantern, cost 3*l.* 3*s.*; also quick acting half-plate portrait lens; these are offered in exchange for a collotype outfit, not less than 15×12.—Address, THE VICTORIA PHOTOGRAPHIC COMPANY, 89, Milkwood-road, Herne-hill, S.E.

Wanted to exchange Entrekin's Eureka burnisher, six-inch, for six-inch rolling press.—Address, E. GOOD, Seaton, Devon.

Will exchange good portrait lens for new half-plate rapid rectilinear lens with iris diaphragm.—Address, H. BOND, Trinity-street, Hastings.

Wanted, hand camera in exchange for forty one-shilling numbers of Cassell's *Our Own Country*, illustrated, uncut.—Address H. R., 10, Smith-street, Warwick.

Exchange Stanley's fifteen-guinea set of mathematical instruments, as new, for half or whole-plate camera set.—Address, G. FIELD, Mentone, Kingston-on-Thames.

Wanted to exchange a Burr 10×8 rapid doublet lens, iris diaphragms, equal to new, for a pair of stereo lenses by good maker.—Address, SIMONS, 3, Hanover-street, Warrington.

Capital half-plate burnisher, oscillating, strong mahogany bed, oil or spirit, for good whole-plate tripod camera stand.—Address, HORTON, Central Studio, 26, Caroline-street, Cardiff.

Wanted lantern slides in sets with readings, temperance subjects preferred, in exchange for half-plate camera and lens with double dark slide.—Address, C. KIRKHAM, Derby-street, Leek.

Will exchange Blackie's *Comprehensive History of England*, complete in twenty-four numbers, as new and not soiled, cost 72*s.*, for good half-plate outfit.—Address, FRED BUZZA, 7, Church-street, Leominster.

Will exchange cycle in working order, value 3*l.*, for Lancaster's combination "Multum-in-parvo" enlarging camera, 15×12.—Address, L. W. THOMPSON, 3, Union place, St. Leonard's-road, Weymouth.

Wanted, Seavey's backgrounds and accessories and Scholzig's graduated ditto in exchange for Fallowfield's cabinet portrait lens, nearly new, and 8×6 floral background in oil. Send photograph to MILTON, South Beach Studio, Pwllheli.

Wanted, in exchange for whole-plate camera, 3 double dark slides, rectilinear lens, and 7×5 wide-angle lens by Marion for a very short-focus cabinet lens by first-class maker, with Waterhouse's stops.—Address, W. BOND, 1, Sprowston-road, Norwich.

I will exchange the *Practical Photographer*, clean and complete, with illustrations, from 1890 to end of 1894, also several BRITISH JOURNAL ALMANACS, for a specimen show-case, studio curtain, or whole-plate tripod.—Address, FRED. D. HURD, Shepton Mallet.

Will give mahogany metal-lined enlarging lantern with four-inch condensers, photographic combination objective, with rack-and-pinion adjustment, three-wick refulgent lamp, for a cushion-tyre bicycle, balls throughout.—Address, WALTON, 5, Crown-street, Hebden Bridge.

Will exchange a Thornton-Pickard time and instantaneous shutter to fit lens hood (two inch), with additional rubber for smaller lens, for a good whole-plate retouching desk, sliding bars in preference to carriers.—Address, F. SPRY, 15, Poltimore-terrace, Poltimore-square, Exeter.

Will exchange 15×15 single-extension square-bellows camera, one single and one double slides with carriers, extra fronts, all fitting in box, R. R. lens and stand; also 10×8 camera, two double slides, Ross's R. R. lens, and French W. A. lenses, fitting in box; wanted Dallmeyer 3B, and 8½×6½ camera with six double backs, by good maker.—Address, WAKEFORD, Sittingbourne.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

RECEIVED.—*Handbook of Imperial Plates, Papers, and Films*; J. H. Blair; and others.

B. T.—We have had no great experience with the brand of paper which you have been using, and think it would be advisable for you to submit the specimens (which we return) to the makers.

CASS.—If you can afford the time and expense, we think that, in a case such as you have described, it is your duty to prosecute. You might thereby save others from being victimised in the same way.

OPTICS.—What you suggest is quite impracticable with a fixed-focus lens. Nothing remains but the employment of either a lens of long focus or a tele-photo lens. No further particulars of the camera are yet forthcoming.

T. B.—You have a clear case for infringement of copyright against the paper, and we should advise you to take the fullest advantage of it. A lawyer's letter to them will make them ready to pay any sum between 1*l.* and 10*l.*, we should think.

WARDER.—If the irregular markings, when the prints were developed, occurred in tissue of your own sensitising, we should say that the cause was in the sensitising; but, as the tissue was sensitised in the making, the cause is inexplicable to us.

C. HOBHOUSE.—We regret we have no knowledge of the commercial aspects of portrait photography in Roumania, or the standard of work produced in that country. Perhaps some of our readers may be able and will kindly supply the desired information.

ENFIELD.—We would advise you to buy the collodion rather than attempt to make it, particularly with methylated spirit. In the manufacture of commercial collodions cost is, of course, a consideration, but methylated spirit, as now made, is not used, except in collodion for enamelling and suchlike rough purposes.

C. B. M.—If you find that the plates of different brands, though marked at, approximately, the same degree of sensitiveness by the Hurter & Driffield system, are so widely different when exposed in the camera, we cannot say the cause of the divergence. Possibly the developer you are using does not suit all plates alike.

R. OSBORNE.—We can give no opinion whatever as to the effect that the various adhesive cements and gums may have on silver prints mounted with them, inasmuch as we have no ideas as to how they are compounded, or what is added to them by way of antiseptics. Some of the latter, which are used in some adhesives, would have a very deleterious effect on photographs. We have no practical acquaintance with the cement specified.

STUDIO.—The form of studio which you seem to be in favour of, sketch marked "A," is not one that we should adopt for portraiture. Its form was introduced many years ago, and adopted by some, but generally with after regret. It is, however, a good form for some purposes, copying for example. The form, sketch marked "D," is the one we should adopt for general portrait work, and, if aspect, &c., is not favourable, then we should prefer design "B."

C. ROBERTS.—There is a wide difference between suggesting how a thing might be done and carrying it out in practice. A mere suggestion need not invalidate a patent. If it did, the Marquis of Worcester's *Century of Inventions* would have invalidated a very large number of patents. Because something similar has been suggested to secure the same end, it need not invalidate a patent, which has since been taken out, to do it in an analogous way. Before acting, we should advise you to consult an experienced patent agent.

A. M. Z.—They have a different system of marking the diaphragm apertures in Germany from that adopted by English opticians. On one occasion we measured the aperture of a foreign lens having *f*-7·7 engraved on it, and found it to be almost *f*-10 by English measurement. We have sometimes thought of writing an article on the discrepancy of the English and German systems, but have not yet done so. An English lens at *f*-8 will be much quicker acting than a German one at *f*-7·7. The other matter must wait a little longer.

DOUBTFUL writes: "Would you kindly let me know what is your opinion as to the P.O.P., whether it is considered dearer than the ordinary sensitised albumenised paper. Also, if you know how much silver it takes to sensitise the quire of paper (albumenised)."—All will depend upon the amount of chloride with which the albumen is salted, and the amount of albumen there is on the paper as well as the proportion of free nitrate of silver there is desired in the coating. Without these details accurately supplied, no reliable information can be given.

AQUA.—The cause of the discolouration of the toning bath is that you have got some extraneous matter in it that has reduced some, or all, of the gold. If it fails to tone with the addition of more gold, a fresh one must be prepared. It is obvious that we cannot give the slightest idea as to what the deleterious material that has caused the reduction is.

SUBURBAN.—We should say the law would be against you, seeing that both houses have not been built more than a dozen years. The old house which yours replaced very likely enjoyed the privilege of "Ancient Lights," but that was, we surmise, forfeited when it was pulled down. We should say you would do better to come to terms with your neighbour than to go into litigation in the matter. Those he proposes are quite nominal, and are merely for the purpose of securing to him the right to build on his ground at any time, the same as you have now done on yours.

OFFA complains that some valuable negatives he took in the spring in Italy have become stained in printing, and mentions that only gelatino-chloride paper has been used with them. He adds that the negatives were not varnished, as "that is not considered necessary now." The staining, doubtless, arises, primarily, from the negatives containing hyposulphite, through imperfect washing and contact with free silver in the paper. With regard to varnishing not being considered necessary, few, we imagine, would think of printing from valuable negatives without varnishing them. But varnishing is not a safe protection unless the fixing salts are thoroughly washed out of the film first.

FRANK WILCOCKSON (Merrion, co. Dublin) sends us a *carte-de-visite* portrait, which, he says, "is a rather unique example of the way in which printers' ink may cause the fading of a photograph. I discovered it the other day in a box, where it had lain neglected for ten years, and, no doubt, had been subjected to damp, which, as you are aware, is a very prevalent quality of this island." The print is mounted on a card, on the face of which has been printed an oval line with a floral design as an *entourage* for a portrait to be mounted inside the line. Everything thus printed shows most plainly on the photograph, which is the full size of the mount, and which is now bleached out over the lines of the design.

A. F. HIBBS says: "I have been retouching negatives for seven years now, working on an average not more than eight hours a day. Now, at the close of the day's work and before, my eyes become bloodshot and ache, as does my head. This has not been the case until about the last year. What would you recommend, as I have to get my living by the only work I understand?"—In reply: We should advise you to consult an oculist, and, if your means will not permit of your consulting a specialist, you had better go to one or other of the ophthalmic hospitals, the one at Charing Cross or that in Moorfields. At either you will obtain the best advice without charge. Possibly some kind of spectacles may be required, and those you will be able to obtain at much below the charges of many of the opticians.

CARBON writes: "Would you inform me the simplest manner in which to print name, &c., on the bottom of prints before affixing to mounts? I don't know whether this is clear to you; but what I want to do is, in printing in carbon, to have the tissue come all over the mount, and the photograph itself to appear on it, the whole of the edges outside print itself, of course, remaining the colour of the tissue, and the name being white. I believe it is done by using a mask in the camera, so as to leave margin of plate unexposed, but cannot quite work out the method for lettering, &c., or is it done in printing?"—Our correspondent is evidently alluding to what used to be known as "chromotypes," which were produced by double printing. Special frames were supplied for the work, in pairs, one to contain the negative and masks for its printing, and the other the counter masks and the lettering set. The latter was on thin films, composed of layers of gelatine and collodion prints from engraved copper plates. The same result was also got by masking in the camera, but it did not come into general use.

Mr. A. RAMSDEN, of Huddersfield, writes: "I notice in your 'Answers to Correspondents' on June 14, under letter 'A.,' that 'A.' has not put the question properly. It was I that warned him against exposing or selling to the public the photographs, and not the photographers. I have the management of a number of children who give an open-air performance. The photographers in question asked my permission to take their photographs, and it was arranged between us that I should use them as an advertising medium, they to make what they could out of the transaction. The photographers were at the trouble of finding a suitable place in the park, and grouping the children; and then 'A.' comes on the scene, and had the presumption to take them without my permission, I enclose a copy of a letter I sent to 'A.,' warning him not to sell or expose them. Will you please grant me the favour of publishing this, as 'A.' did not put the matter correctly?"—The following is our correspondent's letter to "A.": "I understand you took a group of my performers yesterday, June 6, in Beaumont Park. I wish to warn you against exposing them to the public. According to judgment recently given in the Law Courts, in a case of detective camera, any person taking the photograph of another without their consent is liable to prosecution. I shall keep a copy of this in case it is needed."

CONTENTS.

	Page
PHOTOGRAPHERS AS DRAUGHTSMEN: THE CAMERA OBSCURA	401
PHOTOGRAPHING OIL PAINTINGS	402
A CONTINUOUS TONING BATH FOR GELATINE PAPERS	402
JOTTINGS. By COSMOS	405
PHOTO-MEDICAL NOTES ON FORMALIN. By R. H. CUNNINGHAM	406
PHOTO-MECHANICAL NOTES. By WILLIAM GAMBLE	407
DRY PLATES FOR PROCESS WORK	408
SOMERSET. By TOM COAN	409
OLD-TIME NEGATIVE PROCESSES. By JOHN C. BROWN	409
OUR EDITORIAL TABLE	411
NEWS AND NOTES	411
RECENT PATENTS	412
MEETINGS OF SOCIETIES	412
FORTHCOMING EXHIBITION	413
CORRESPONDENCE	414
EXCHANGE COLUMN	415
ANSWERS TO CORRESPONDENTS	416

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1835. Vol. XLII.—JULY 5, 1895.

PHOTOGRAPHING THE HEAVENLY BODIES BY AN ORDINARY CAMERA.

We first of all desire to disabuse the mind of the average photographer that, in order to practise celestial photography, he must necessarily be possessed of very costly instruments, such as elaborate and large astronomical telescopes, and equally elaborate equatorial stands, with clockwork for driving the same, which are undoubtedly necessary in the observatory in which it is desirable to get out of the heavens all that they contain. But our desire at present is to point out how a vast amount of real pleasure is to be obtained by practising celestial photography with such a camera, lens, and stand as all photographers are supposed to possess.

The dimensions of camera in which we have found the balance of advantages to reside is that for 5×4 plates, the lens used in conjunction with it being a portrait one, which works with great rapidity of action, covering the above-named plate without any diaphragm. When we state it to be the well-known No. 2B of Dallmeyer, our readers will at once realise that its aperture is two and three-quarter inches and its intensity great.

From our experiments on the moon with this lens, we find the concentration of light so great as to permit of an instantaneous exposure being given. As every one knows, the moon sails across the heavens with an apparent quick motion, a motion that will be more readily appreciated if it be examined by a telescope fixed on a stand. With a lens such as that just mentioned, and on a clear night, an exposure of such short duration may be given as to enable a well-exposed negative to be secured—one which, when examined under a compound microscope, shall show, in a well-marked manner, all the salient features of our satellite. This cannot be obtained if the exposure be prolonged, in consequence of the lunar motion, owing to which any departure from instantaneity will give an elliptical instead of a circular shape.

It need scarcely be remarked that, by employing a lens of longer focus than the one mentioned a larger image will be obtained; but, unless the angular aperture of the objective be equal to the shorter one, this will be at the expense of rapidity, unless, of course, the camera be mounted on an equatorial stand, when the exposure may be prolonged to any necessary extent.

We have spoken of a high-class equatorial stand as being expensive. So it is for observatory work, but for ordinary photography it need not be so. It is quite possible to construct one of a somewhat rude appearance for a few shillings, but which will be capable of doing good work. We will describe one of this class, which we had made some time since.

The legs are hinged to a very strong table, on which are two spirit levels standing at right angles to each other. Raised up at a slope from the table is a strong tube, which is fixed very securely. The angle at which it is raised must be equal to the latitude of the place where operations are to be performed. This can easily be ascertained from any good map, in which the lines of latitudes will be found given at the right and left sides. For example: At Kirkwall it would be found to be 58° 59′; at Edinburgh, 39° 56′; at London, 50° 31′, and so on. The tube, when thus erected, forms the polar axis, for it must always point to the pole star, and it must be supported in a steady position by a strong strut. We may here note that the pole star is not absolutely stationary in the north, but it is quite near enough to serve our present purpose. A rod, which carries the table for the camera, is fitted to pass smoothly into the upright tube spoken of so as to allow the camera to revolve. The table on which the camera sits, and to which it is attached by a thumbscrew, is folded, and is hinged at the front, so as to be capable of being directed up or down and pointed to any object in the heavens. When this is done, a pinching screw secures the hinged part, to which the camera is attached, at the angle found necessary.

No other adjustment is needed for that particular object, which may be the moon, a constellation, or planet. By rotating the camera slowly on its axis, a celestial body may be kept motionless on the sensitive plate for a protracted period. When the lower end of the polar axis terminates in a fine point fitting into a socket, and friction is thus diminished, it is surprising with what ease a heavy camera is made to revolve even by such a flimsy motor as one of those round lever clocks which are sold everywhere at two to three shillings.

To give the proper motion to the camera is a matter of the utmost importance. One way in which we had an equatorial camera stand made, and by which the camera could be made to rotate by hand with a wonderful degree of exactness for a brief period, was by having attached to, and projecting from its side, a segment of a finely toothed wheel, into which geared an "endless screw" terminating in a handle, one revolution of which caused the segment of the wheel to revolve to the

extent of one tooth, the camera being, of course, carried forward in a corresponding degree. It is important that a powerful little telescope be mounted on the same stand as the camera. In the eyepiece of this must be fixed cross hairs, and the eye and hand of the operator must be so tutored that, when the image of, say, the moon is seen on the cross hairs, it must be kept in exactly the same spot by the rotating of the handle of the endless screw referred to.

A very pretty negative of a constellation, suitable for employing as a lantern slide, may be taken instantaneously by the portrait lens already alluded to, or one possessing similar characteristics. In this case a stand, although convenient, is not an absolute necessity. The first thing one will notice is that, whereas with an instantaneous exposure the principal stars of a constellation will only appear in the negative, yet, if the exposure be prolonged, the number of those photographed will be increased; while, by prolonging the exposure still more, stars so remote and weak as to be incapable of being seen by the eye at all will be visible in the photograph. This, as we have formerly pointed out, is the principle underlying the new astronomy.

When the subject is wanted to be magnified to a considerable extent, a tele-photo lens will be found to be an improvement upon the ordinary photographic lens.

PRISMS AND MIRRORS FOR REVERSED NEGATIVES.

THE continuing spread of the mechanical processes of photography, in which reversed negatives are an essential, has led to the now very general plan of taking such negatives direct in the camera by the aid of optical appliances—prisms or mirrors—to the almost exclusion of other methods of producing them. When some operators, for the first time, take either a prism or mirror to work with, they often get into difficulties through not knowing anything about the instruments they have to employ. Although the subject of reversing mirrors and prisms has been dealt with by us more than once within the past few years, it does not seem to be well understood by some present-day workers, hence our again alluding to it in a practical way.

Only quite recently we were asked questions in connexion with mirrors which, one would have thought, would have been impossible from workers of no little experience, such as, Why would not a piece of ordinary looking-glass, that may be had for a few pence, do as well as the mirrors which are sold at high prices? or, Why is so much more charged for a piece of glass silvered on the front than for a piece which is silvered on the back? Even as recently as a few days back a process worker remarked to us that he had been obliged to stop work for the day, as one of his lads had, accidentally, made "a scratch right across the mirror," and it had to be sent away to be resilvered. He seemed to be much surprised when told that the scratch would have done no harm whatever. One would have surmised that it would have been obvious to every body that a looking-glass silvered on the back has two reflecting surfaces, that it would, necessarily, give a doubled image in the camera, and consequently would be useless for photographic purposes. It was not, however, in the instance referred to, until it was pointed out. Not a few still seem to be under an impression that a piece of ordinary plate glass, silvered on the surface, will answer as a reversing mirror for taking negatives. That, of course, is an entire fallacy, as the surface of the glass must be as accurately worked as is the surface of a lens.

We shall digress for a moment from mirrors to consider the question of prisms as a means for the reversal of the image. Although prisms have but a limited use in this country, they are in more general employment on the Continent than mirrors. They are usually fitted in front of the lens, and the only advantage they possess over the mirror, so far as we can learn from those who have had considerable experience with them both here and abroad, is that there is no silvered surface exposed to the air to get tarnished. Prisms are, necessarily, much more costly than are mirrors, particularly in the larger sizes. The prices quoted in the catalogues of two of the most eminent Continental makers for those with something less than five-inch surfaces is equal to from sixty to seventy pounds each. This price seems high, but unless a prism is very perfect it is impossible to obtain sharp negatives with it. In a prism there are three surfaces, each one true with the others, to be worked, while in a mirror there is but one. The glass is also an important factor in the case of the prism, as it must be free from all optical imperfections; with the mirror, the optical qualities of the glass are of no import, so long as it is properly annealed, as its only function is to support the silvered, or reflecting, surface.

The chief point in connexion with a mirror is that the surface upon which the silver is deposited is an optically plane one, and to obtain that requires as great, or greater, skill on the part of the optician as does the working of the surfaces of a high-class lens. An equally important point is that the mirror is not bent in the slightest degree in its mounting. A perfect mirror, although it may be a quarter of an inch, and more, in thickness, may be so bent, even by very slight pressure, as to render it quite useless. It must be kept in mind that an imperfect mirror or prism will quite spoil the performance of the finest lens that was ever constructed. Well-seasoned wood is generally preferred to metal for the mount, and the glass must be free from pressure in every direction; in fact, it should be so loose in its setting that it will slightly rattle when shaken.

Sometimes the mirror is fitted before the lens and sometimes behind it—usually the former. In this position it is more exposed to the atmosphere, while in use, than when it is behind the lens; but, on the other hand, when it is in that position, it is exposed to the moisture and emanation from the sensitive plate, if wet collodion is the process employed, and that is most generally the case when mirrors are required. Mirrors, when out of use, should be kept in a dry place and protected from the atmosphere, so as to avoid the tarnishing of the silver as much as possible. The tarnishing does not interfere with the performance of the mirror beyond prolonging exposure. The tarnish can be quickly removed with a small piece of chamois skin and a little fine rouge, lightly applied. Before beginning to clean a mirror, care must be taken that the silver is perfectly dry, or it will rub off. It is always a good plan to place the mirror in the sun, or before a fire, till it is quite warm, before polishing. It should be kept in mind that constant cleaning wears away the silver surface, therefore tarnishing should be guarded against as much as possible. With care, even when in constant use, a mirror will last for many months—or for a year, or more—without resilvering. Resilvering is, however, a very simple affair, by the methods given in the *Almanacs*, after a little experience has been acquired.

With regard to scratches. Some persons seem to be under ıe impression that, if a mirror gets accidentally scratched, ıe scratches would show in the negative, hence the mirror ıust be resilvered forthwith, as in the case just referred to. It eed not, however, be said to the more practical of our readers ıat this is quite a fallacy. The only trouble that arises from scratched mirror is a loss of so much reflecting surface—less ght—and consequently a slightly longer exposure is entailed; ut, if the scratches are slight, that will be infinitesimal.

A CONTINUOUS TONING BATH FOR GELATINE PAPERS.

Before proceeding further, we may once more emphasise the mportance of thorough washing, in order to remove every race of free silver and other soluble matter from the prints efore toning. By thorough washing we do not mean simply a prolonged soaking in two or three changes of water, for this s not only ineffectual in removing the soluble salts, but it is ctually injurious, inasmuch as it permits the free silver in an ctive state every opportunity of entering into combination r forming compounds with the gelatine. By leaving a umber of prints to soak in the first water in which they are washed, they are, in fact, practically submitted to the action f a solution containing, amongst other matters, a considerable roportion of silver nitrate, the effect of which upon the elatine film, to leave out of the question altogether the silver mage, can scarcely be looked upon in a favourable light.

In washing, therefore, we counsel, that the prints be emoved almost immediately from the first washing water, which should be of the purest kind available. Distilled water s, of course, in the great majority of cases, altogether out of he question, though, when it is readily and cheaply obtainable, he advantage of its use for the first washing will be soon ecognised, for, other things equal, there is less loss in toning nd fixing of the finer details of the proofs. A comparatively mall quantity will suffice, the prints being passed through it a few at a time, and only allowed to remain sufficiently long to be thoroughly wetted before passing them into a second vessel, from which in turn they should be quickly passed into fresh water. If this course be adopted, the bulk of the silver and other soluble matter will be extracted by the first water, and little or no action will be permitted upon the gelatine film.

If distilled water is not available, shift must be made with the best that can be obtained, and in most households there will be found some sort of a supply of rain water—limited in many cases possibly—but sufficient to afford a pint or two occasionally for toning and washing purposes. If the supply of soft water be drawn from the ordinary "water butt," or from any receptacle that is not periodically cleaned out, it will be well to test it for organic matter, for this, if present in any considerable quantity, may prove even more injurious than the saline impurities of hard water. If on the addition of a few drops of a weak solution of permanganate of potash, or of diluted Condy's fluid, the pink colour is *quickly* discharged, the water will require boiling before use. Before subjecting it to this treatment, however, it will be well to add cautiously a few drops at a time the dilute permanganate solution until a permanent tint remains, after which it may be boiled and allowed to cool and settle, when it will be fit for either washing purposes or for mixing up the toning solutions.

After the first two or three changes of water, which should be as rapid as possible, the prints may remain for not more than five minutes each in another two or three changes, when every trace of soluble matter may be considered to be practically gone; but, if the earlier soakings are prolonged, the same amount of subsequent washing will entirely fail in removing the silver, which, in fact, seems to tie itself up loosely with the gelatine. It is often recommended to use a bath of common salt in weak solution for the purpose of converting the free silver, but this has a decided effect in slowing the toning action, besides a greater reduction in the depth of the print during toning and fixing. This is the only objection and where it is not of great moment, *i.e.*, where the printing has been carried to a sufficient depth to permit it, or where prolonged washing is not convenient, the salt bath may be used, but the use of plain soft water is always to be preferred.

The toning solutions should always be made up with distilled water, or at least with purified rain water, more especially when the phosphate bath is employed. This applies not only to the solution of phosphate or acetate of soda, but equally or even more strongly to the gold, for, though the separate solutions may be rendered perfectly clear by filtration, they will form a sediment on mixing if hard water has been used in their preparation, and it is this precipitate of lime salts that has very much to do with the decomposition of the toning bath after mixing as well as after use.

To sum up the requirements for toning successfully with the same solution day after day, they are: thorough washing of the prints in pure water and the absence, as far as possible, of lime or other salts from the toning bath; these conditions being observed and ordinary care, the rest is comparatively easy, or at least no more difficult than was formerly the case with albumen paper.

The first bath we worked in the "continuous" manner was the ordinary phosphate bath, consisting of twenty grains of phosphate of soda, and one grain of chloride of gold in from eight to ten ounces of water. This, as we remarked in our article last week, is not supposed to be a keeping bath, nor is it, perhaps, in the strict sense of the term, for, if it be mixed and left to stand for some hours, it gradually loses its toning action, or becomes very much slower. If, however, it be used within two or three hours, it is extremely rapid in action, even at the lowest strength mentioned above, but for eight or ten hours it still tones regularly, though more slowly.

If a freshly made bath be only half exhausted, that is, if only half the number of prints it is capable of toning be passed through it, and it be left over until next day, its toning action will be practically gone, although the solution itself may be quite colourless and still contain a considerable proportion of gold; but, if a fresh quantity of gold solution equal to that abstracted in toning, or even less, be added to it, its toning properties are immediately restored, and it behaves in every way like a freshly made bath, with, perhaps, a slightly slower and more regular action.

But the peculiarity of this method of using the phosphate bath is that the periodical revivifying of the used solution appears to prevent its decomposition; for, if a bath that has been once used be divided into two portions one of which is set on one side while the other is used in the manner described day after day, the latter will keep colourless and in working order long after the other has become discoloured and useless. At times, for some unexplained reason and without any appearance of discolouration, the bath will cease to tone or begin to

tone slowly; on such occasions and those only is it necessary to add any more phosphate of soda and there only in comparatively small proportion, perhaps a quarter of the quantity originally used for the volume of solution.

But after use for an indefinite period the phosphate bath shows a tendency to go suddenly wrong without any apparent reason unless it arise from some unconscious carelessness. Such fits are usually preceded by a slight cloudiness or opalescence in the solution itself, though how caused we are unable to say, and when this state is reached no method of treatment we have tried will prevent the further decomposition of the bath nor restore its toning powers when lost.

In this respect the acetate bath differs from the phosphate. It may be used in precisely the same manner, the same precautions in the matter of washing being observed; but it may be strengthened immediately after use by the addition of as much gold as has been abstracted instead of waiting until the bath is to be used again. In fact, this is the plan that should be adopted; beyond that the treatment and behaviour of the acetate bath are precisely similar to the phosphate; but, if the acetate bath should go wrong and lose its toning action, it is only necessary to acidify it with a little hydrochloric acid and set it aside for twenty-four hours, when any discolouration or muddiness will have disappeared, and it only requires the addition of fresh gold and sufficient acetate of soda to restore the alkaline condition to bring it into working condition again.

As regards the quantity of acid to be used, it is merely necessary that the bath should faintly redden litmus paper, and, if this condition be not exceeded, the further addition of a single grain of gold and thirty grains of acetate of soda to twenty ounces of solution will suffice to restore the equilibrium —provided, of course, it contained a sufficiency of gold previously. When the toning action becomes slower without being altogether arrested, the addition of a little acetate of soda will set matters right, but otherwise nothing is needful except to replenish the gold used.

As a matter of precaution, whichever bath be used, it is a good practice to pass the solution through a filter after use, to remove any chance impurities with which it may have become contaminated, as any foreign matter sets up a tendency to decomposition. If these directions be strictly attended to, we think no difficulty will be experienced in successfully working the continuous toning system.

Hints upon the Economy of Lighting.—In Messrs Groves & Thorp's new volume (vol. ii.) of *Chemical Technology*, it is shown that some commonly held notions on this subject are erroneous. A room which would be well lighted by twenty separate candles will be but poorly lighted by one single twenty-candle-power light. Further, if the flame of such a lamp be surrounded by an opal globe (which may probably intercept half the light produced), the room will, nevertheless, be better lighted than by the naked flame.

Lightning Conductors.—We are asked if we can supply any information with regard to the use and need of these appliances in photographic studios. The matter seems one of real importance, seeing how desirous photographers usually are to get above the level of surrounding buildings with their studios, so as to avoid loss of light. We are, however, unable to supply the desired information, and the matter is mentioned in this place in order to obtain data from any willing reader who has any practical experience in the subject, or who can refer to examples of studios damaged by lightning.

Further Scientific Applications of Photography.—Writing of the recent meeting of the Institution of Naval architects, *Nature* says: "No account of the Paris meeting would be complete without reference to the beautiful photographs shown by Mr. Bertin in illustration of the movements of ships in sea waves. These photographs were taken by the method devised by Mr. Marcy, a dozen or more different views are given of a ship during its passage through a wave, and the whole movement can thus be fixed and analysed. The value of such data to the naval architect is, of course, immense."

Thermometer-testing.—It is generally understood that the freezing and boiling points of water are the two fiducial temperatures that are most readily and exactly found for thermometers graduating from natural standards; but the confidence hitherto felt is, at any rate in one direction, roughly shaken by the dictum of Mr. Rhodes, of the Kew Observatory, who, at a recent meeting of the Physical Society, said that he had found that the method of determining the zero point by means of melting ice was far from satisfactory, and that the results so obtained could not be relied upon, at any rate to within a tenth of a degree Centigrade.

Detecting and Estimating Chlorine in Presence of Iodine.—Herr P. W. Raikow describes a new and simple method with phenylhydrazine, of which he proposes a solution in dilute sulphuric acid and adds an excess of copper sulphate, the solution remaining clear if there be less acid present. If this test is added to a liquid containing a chloride and an iodide, a bulky brownish precipitate containing all the iodine will be thrown down. Chlorine may then be tested for by adding silver sulphate. If it be desired to ascertain the amount of iodine, the brown precipitate may be dissolved by boiling caustic potash solution, and the iodine estimated in the usual manner.

Simple Centrifugal Apparatus.—Herr Georg W. A. Kauhlbaum describes, in a German periodical, a new and very simple arrangement which, in view of the work done in emulsion-making by the centrifugal separator, may, under a modified form, prove to be useful in small experimental work of the kind. The apparatus consists of two test tubes, one sliding in the other, the inner one having its end cut off and closed at the end by a disc of platinum gauze joined by fusion. It is devised for separating crystals from the liquid surrounding them, though, of course, this is only one of its applications. The mass of crystals is placed in the inner tube, which is then closed with a cork, and the whole, which has previously been attached to a string tied to the open end of the wider tube, is whirled roun by means of the string.

New Mode of Removing Fixed Stoppers.—We opine that there are few of our readers who have not experienced the annoyance at some critical moment of a stopper so tightly fixed as not to be amenable to any ordinary treatment. Writing on this matter to the *Chemical News*, Mr. R. W. Hill says: "Of course, the best remedy is to heat the neck of the bottle for a while over a Bunsen burner; the serious drawback to this old-fashioned method lies in the fact that, the bottle being held in the horizontal position, the fluid may be easily spilled. I have," he says, "solved the little problem in an efficacious, up-to-date, though expensive, manner, by rigging up an adjustable clamp with coils of platinum wire embedded in a strip of asbestos attached to the clamp. You press the circular clamp round the neck of the glass bottle, then press the button, and electricity does the rest."

A New Miniature Arc Light.—A writer in the *English Mechanic*, over the signature of Henry Leitner, Berlin, describes as in actual use, and examined by him, a new small arc-light arrangement, which for a large variety of photographic purposes would seem to be the very lamp that has long been wished for. He states that it is to be seen in actual use at the reception-room of Mr. H. Niewortly, electrical engineer, of 1, Chaussestrasse, Berlin. This

room is lighted by a beautiful non-dazzling central light on the arc system (not a combination of arc glow), which during five hours' observation "burnt" with absolute steadiness and with a light that was equal to at least six ordinary incandescent lamps of sixteen candle power, requiring a total of 330 watts. The light is indistinguishable from daylight, and the power needed is only thirty-five watts per hour. As Mr. Leitner says, "the figures speak for themselves;" we can only say we hope it is not too good to be true. If the account should be correct, this lamp will almost cause a revolution in electric-lighting methods for domestic and scientific use.

ON THINGS IN GENERAL.

"I KNOW that man, and he comes from Sheffield," we have most of us heard Mr. Hare state, and so Mr. Editor would say if he knew anything of the Mr. Reichart, whose grotesque tale, as told by the *Publishers' Circular*, is given in this JOURNAL for June 7. "I know that man;" his name doesn't sound like Sheffield, but his words do. I do not suppose for one single instant that the cool insolence of the suggestion to use any photograph an editor wants without even inserting the name of its producer so long as it is not copyright, is unlikely to have been made by him. As to the assertion that, "in ninety-nine cases out of a hundred, such copyright does not exist, and illegal fees are demanded, which are often paid merely to save bother," whether he made it or not ("I know that man"), it is pure fiction. If he care to prove the words, if they are his, I shall have pleasure in handing over 5*l.* to the Photographers' Benevolent Society, if he will do the same upon failing to prove what I designate an outrageous libel.

It is to be hoped that when the new Parliament meets a satisfactory copyright Act may be passed that will give a poor photographer a fair chance of redress when his copyright is infringed. It may be said that we have the Photographers' Copyright Union, which will do it for him; but what is the practical use of such an institution? I ask, first, will they undertake to go to court with any case on which there is a shadow of doubt as to ultimate success? and, secondly, what is the use, then, of employing their mediation, seeing that it involves paying the Union a good commission on the job? They stand to lose nothing when they work on a basis of certainty. Does any one know what it costs to lose a lawsuit where a photographic copyright is involved? A couple of hundred pounds would not be an extravagant estimate. With the knowledge of this state of affairs well in view, the "I-know-that-man" sort of editor feels pretty secure in bouncing the unfortunate wretches out of their legal rights whose photographs have had the honour of appearing in his pages. I trust that what I have said will not be deemed personal by the Secretary of the Photographers' Copyright Union, for I have seen beautiful letters that he has written—letters in reply to a subscriber which ought not to be less valued because of the time that passed before the reply to his correspondent arrived at its destination.

Mr. Chapman Jones's paper on yellowed platinum prints is a most valuable contribution to the due understanding of an important subject. We are all pretty well assured that platinotype prints are really permanent, and a good many workers of the process at the present time have no practical knowledge of this yellowing, that is so very apt to disfigure them after the lapse of a greater or less number of years. But who that has used the process, say, for a dozen years, is there without such experience? I got very eager in my perusal of the paper when I reached the cure part, but my disappointment was the greater when a description of the cure was followed by the statement that the chlorine treatment to remove the brown stain does not confer immunity from change by sulphuretted hydrogen. It is, however, a distinct advantage to learn that, by a long treatment with dilute hydrochloric acid, the presence of iron was entirely done away with. What a petty ending the discussion on such an important paper came to—neither more nor less than a squabble as to the meaning of the terms "staining" and "toning!"

The articles on copying oil paintings that recently appeared in these pages have contained much practically useful matter, and, with the editor's permission, I will add a further hint. Let the copier beware of standing by the camera during exposure, and, further, let him not work in his shirt sleeves, nor "sport" much linen generally. I have seen more than one negative with a mysterious, inexplicable smudge, which was nothing but the reflection of the copier's face, or his white cuffs, during the uncapping of the lens. *Verbum sapienti.*

This Dr. Morway's series of interviews with photographers is really getting monotonous. The result is always the same—the transference of gold or silver medals to his palm. It would appear that the thing now to write about is to describe how some one was not victimised rather than of some one who was.

I was extremely pleased to read the heavy snub given by the Editor to the correspondent who asks if he can be legally estopped from selling photographs he had impudently snatched from a group of people gathered together, arranged, and posed by another photographer. I hope he will equally set his face against unauthorised snap-shotters at the Convention. To my mind it is highly undesirable for any one to photograph the Convention group except the officially recognised artist of the day. If photographers themselves will not set the example of a little self-repression, how can they possibly expect the general public to refrain? FREE LANCE.

PINHOLE PHOTOGRAPHY.

[Photographic Society of Japan.]

SOME couple of years ago, one of our members, Mr. J. Favre-Brandt, of Yokohama, read a very interesting paper upon the above-mentioned subject. Pinhole work, as he said in his valuable paper, certainly claims our attention on account of the quality of photographs that can be obtained in a darkened chamber or camera, without special optical apparatus, simply by means of a small hole in a very thin plate. My intention in this paper is to give you a report of my own experiments with the improved pinhole apparatus which Mr. J. Favre-Brandt has forwarded to the Editor of the *Shashin Sowa*, and which I now show you.

For reference I quote his paper:—"Mr. Meheax says the most suitable hole is round, and drilled in a plate of sheet copper or brass of $\frac{2}{10}$ millimetre in thickness; it is necessary that the borders show no burr, and are bevelled, forming a cone.

"Captain Colson has remarked that, although the depth of focus is unlimited, the greatest sharpness of definition for each size of hole is found at a determinate distance, and he has succeeded in finding the proper focal distance for different diameters of holes; he has thus found:—

The best definition of a hole	$\frac{3}{10}$	mm.	is	at	11	centimetres.		
"	"	"	"	$\frac{4}{10}$	"	"	20	"
"	"	"	"	$\frac{5}{10}$	"	"	30	"
"	"	"	"	$\frac{6}{10}$	"	"	44	"

Mr. J. Favre-Brandt has quoted Capt. Colson's table about focal distance, and the former's improved pinhole apparatus is also made in accordance with the above table, as can be seen from the figures on the apparatus itself. On the left side are marked 3, 4, 5, and 6, which mean respectively $\frac{3}{10}$, $\frac{4}{10}$, $\frac{5}{10}$, $\frac{6}{10}$ millimetre, and the figures on the right show the focal distances in centimetres.

It is a great pleasure to work with so perfect an instrument, as it makes experimental or practical work with the pinhole easy in the matter of focussing the picture and exposing the plate.

The apparatus consists of two brass plates, of which one is rectangular, the other round; the round plate can be rotated on its axle upon the rectangular one by turning a milled head from the other side of the apparatus. The rectangular plate has four holes at the corners, for fixing the apparatus on the front board of the camera, with the round plate inside. On the back of the apparatus, on the round plate, are to be seen four plano-convex lenses of small diameters, set in holes of corresponding size, which are for use as focussing lenses or finders; besides this, there are pinholes of $\frac{3}{10}$, $\frac{4}{10}$, $\frac{5}{10}$, $\frac{6}{10}$ millimetre diameter, bevelled at the edges to form a cone. The plano-convex lenses are 11, 20, 30, and 44 centimetres in focal length to correspond to the best definition of the holes. On the front of the apparatus, at the centre, is a milled head, by turning which the round plate inside is caused to revolve; on the left are the figures 3, 4, 5, and 6, and on the right 11, 20, 30, and 44; these figures show that, on reading horizontally, if a $\frac{3}{10}$ millimetre hole is used to take the picture, it is necessary to extend the bellows of the camera, so as to make the distance between ground glass and pinhole 11 centimetres, to get the best definition. Also on the front are two openings, of which one is used to bring any of the pinholes into position for exposure, or any of the lenses for focussing, by turning the milled head and bringing the round plate into proper position. There is also a register for the pinholes and focussing lenses.

For instance, if we are going to use the apparatus, we fix it to the front board of the camera, then we set up the camera, and, if we wish to take a picture with $\frac{4}{10}$ millimetre hole, first we turn the milled head till

he opening registers 4; then the plano-convex lens of the focal length 20 centimetres is in position; we now focus the view or object, whatever it may be; after this is done, we turn the milled head again, until 4 is once more registered, but this time with the pinhole instead of the focussing lens. Now the pinhole is at the best distance from the ground glass to give a sharp image, and is ready for exposure by inserting the dark slide in its place.

I have made practical test of Mr. J. Favre-Brandt's improved apparatus, and have found there is nothing wanting as to the exactness of the pinhole diameters and the focal lengths of the focussing lenses, which are the two most essential parts of the apparatus. The working parts also act without hitch. I have revised the focal length by Captain Colson's formula, and found the figuring on the apparatus to be quite correct, except that the decimal part is cut off to make round numbers. These decimal parts are, of course, not necessary in pinhole work.

On the first introduction of this improved apparatus, Professor W. K. Burton made some experiments with it and got good results. Now, my temptation to experiment in this kind of work was that there are other formulæ besides that of Captain Colson's, too many formulæ for one and the same thing are confusing to unmathematical minds. Though I do not intend to run down any formula, I cannot help deprecating this confusion, especially as the results are such that I can hardly tell that one formula is superior to another.

The method of experimenting was as follows:—First, by one formula I found out the focal length, or rather distance, of best definition for holes of $\frac{3}{10}$, $\frac{4}{10}$, $\frac{5}{10}$, $\frac{6}{10}$ millimetre diameter; from these focuses I deduced the angular values of aperture, and then from this the U.S. numbers for ascertaining the exposure. Doing this, I took, first, Captain Colson's formula, as Mr. Favre-Brandt did, in which the focal length corresponds with the figures on his improved apparatus, and then I took that of Mr. T. R. Dallmeyer. According to this preliminary calculation, I made my actual experiments.

1. Captain Colson's formula for determining the distances between the hole and the sensitive plate to get the best definition is $f = d^2 \times 00081$; of which f equals the focus, and d the diameter of the hole. By applying this equation, I got the following table:—

Diameters of holes. mm.	The distances of best definition. cm.	Angular value of the apertures.	U.S number of the apertures.	Exposure supposing 1 second with U.S. 3 2 stop.
$\frac{3}{10}$	11·11	*f*-370	8555	4′ 27″
$\frac{4}{10}$	19·72	*f*-493	15200	8′ 0″
$\frac{5}{10}$	30·86	*f*-617	23793	12′ 24″
$\frac{6}{10}$	44·44	*f*-741	34317	17′ 55″

2. The formula given by Mr. T. R. Dallmeyer is $f = r^2 \cdot \lambda$, in which λ is the wave length of light chiefly used in photography, and which is generally taken as $G = .000017$ in.

$$f = r^2 = /\lambda = r^2/.0000432 \text{ mm.} = d^2/.001728 \text{ mm.}$$

By this formula, proceeding with the calculation, I got the corresponding table as following:—

Diameter of holes. mm.	The distance of best definition. cm.	Angular value of the apertures.	U.S. number of the apertures.	Exposure supposing 1 second with U.S. 32 stop.
$\frac{3}{10}$	5·21	*f*-174	1892	1′ 1″
$\frac{4}{10}$	9·26	*f*-232	3346	1′ 45″
$\frac{5}{10}$	14·47	*f*-289	5220	2′ 45″
$\frac{6}{10}$	20·25	*f*-336	7056	3′ 45″

As seen from the above table, the two formulæ differ widely from each other. Mr. A. C. Ponton, of Bournemouth, expresses the opinion that all formulæ for pinhole photography are valueless, and that all large apertures give softness and all small ones sharpness. He also expresses the curious opinion that eight times more photographic energy passes through a pinhole than through a lens having a stop of the same diameter.

According to Captain Colson, 11 centimetres is the distance for best definition with a hole of $\frac{3}{10}$ millimetre in diameter, and, according to Mr. Dallmeyer, 5 centimetres is the distance for the best definition with a hole of same diameter, while, according to Mr. A. C. Ponton, these and all other formulæ are nonsense, so that confusion is only worse confounded.

I have made experiments with both the formulæ above quoted, in each case making exposure with holes $\frac{3}{10}$ and $\frac{5}{10}$ millimetre diameter, whilst one exposure has been made with an ordinary rectilinear lens, with U.S. 32 stop. [Prints were sent round showing results with pinholes, after Captain Colson's formulæ, with $\frac{3}{10}$ and $\frac{5}{10}$ hole respectively; and, after that, of Mr. T. R. Dallmeyer's, with the same holes respectively; also the results with a rectilinear lens with U.S. 32 stop.] When I made my experiments the light was most favourable, that is, it was somewhat diffused and bright, the time was ten o'clock a.m., and the plates were Marion's ordinary actinometer No. 40. With the lens I gave an exposure of one second with 32 stop; with the pinholes I gave exposures respectively of 4′27″, 12′24″, 1′1″, and 2′45″ respectively. For development I took pyro-soda developer, and developed in the same bath, and in all cases the image appeared and was finished at the same time. This proves that in all cases the proportions of the exposure were quite the same; and it proves also that the energy of light passing through a pinhole is not much different from that through a lens, in spite of what is stated by Mr. A. C. Ponton. Indeed, if there is any difference in energy, it is so slight that we cannot notice it.

As to the definition, which is the most essential part of the experiment, the results by Captain Colson's and Mr. Dallmeyer's equations are barely distinguishable. If there is any difference, the results by Mr. Dallmeyer's equation are sharper than those by Captain Colson's, but we must remember that in the former case the exposures were a great deal shorter than in the latter, so that there was less chance of vibration of the camera. I do not hesitate to say that the definition in both cases is practically the same, and that there is a great range of pinhole diameter with the same focal length, or of focal length with the same diameter, giving practically the same definition. Still, there is some limit for good definition.

Before concluding my paper, I quote another interesting pinhole table by the Rev. F. C. Lambert, M.A., as follows:—

TABLE OF COMPARATIVE PINHOLE EXPOSURES.

If with a given plate, light, subject, &c., and a lens working at *f*-16, the correct exposure be one second, then, under the same circumstances, the following table gives the corresponding exposure in minutes:—

Distance of hole from place in inches.	Diameter in inches.			
	$\frac{1}{50}$	$\frac{1}{44}$	$\frac{1}{30}$	$\frac{1}{20}$
	min.			
6	*6			
		4½ min.		
8	10	*8	5	
			min.	
10	16	13	8	
				min.
12	24	18	*12	6
14	32	24	15	8
16	40	32	20	10
18		41	26	13
20			32	16
				*24

On examining this table, I found that the marks for best definition corresponded to Mr. Dallmeyer's formula. Also I observe the $\frac{1}{50}$ of inch in the table nearly corresponds with the $\frac{5}{10}$ millimetre of the two preceding tables; of which 6 inches' distance of hole from plate, and 6 minutes' exposure practically exactly corresponds with my experiment, No. IV.; of which 12 inches distance of hole from plate and 24 minutes exposure corresponds with that of No. III. Looking at the table in the first column we find, the range of focus for $\frac{1}{50}$ inch hole, from 6 inches to 16 inches, which lies between Captain Colsons's focal length to Mr. T. R. Dallmeyer's focal length.

I shall say, in concluding my paper, that I do not hesitate to state that the best definition of image in pinhole photography can be got within the range of Captain Colson's formula and that of Mr. T. R. Dallmeyer, and that, if the worker takes advantage of Mr. J. Favre-Brandt's improved apparatus, and adopts the figures on the apparatus as the *longest* limits of focus, he may reduce the distances to those of Mr. T. R. Dallmeyer's according to the nature of the subject to be included.

I conclude by quoting Mr. Favre-Brandt's paper as follows:—

"To sum up the advantages of using the pinhole:

(1) More artistic definition than a lens.
(2) Unlimited depth of focus.
(3) Perfect perspective for lines in architecture.
(4) Mathematical exactness in the scale of plans.
(5) The angle of view can include as much as 170 degrees."

Mr. W. K. Burton had had the privilege of reading Mr. Isawa's paper some time before the meeting, and had made a number of exposures with different distances and different pinhole apertures, using as subject a landscape in some cases, in others a point of light or "artificial star" in the form of the reflection of the sun from a silvered glass ball placed at a considerable distance from the camera. His conclusion was that the best results were got by holes cut in accordance with Mr. Dallmeyer's equation. Holes either larger or smaller gave worse definition.

Some of the results of exposures on the "artificial star" showed remarkable phenomena produced by diffraction and interference of light.

Mr. Favre-Brandt had sent a neat leather case containing a set of single uncorrected lenses of various focal lengths. There were also photographs taken by the lenses which showed that, making allowance for want of achromatisation as by the table that follows, excellent results

* Indicates range of distance of hole from plate for best definitive, e.g., $\frac{1}{20}$ gives best definitive from 20 to 24 inches away from the hole.

could be got with apertures as large as *f*-10. The following is a translation of a communication in French that was sent by Mr. Favre-Brandt along with the lenses :—

We beg to submit to the Photographic Society a few remarks concerning the use and properties of the *trousse bésicles*.

Every one is not in a position to buy costly objectives like those made by Goerz, Zeiss, Dallmeyer, Ross, Hermagis, and others, all so well known by photographers in Japan, thanks, in a great measure, to the efforts of Professor Burton, who, among the propagators of the science of photography, ranks as an authority of world-wide reputation.

We unpretentiously beg to submit the *trousse bésicles* to the trial of the Society, and to point out that this new contrivance is designed to allow both rich and poor to indulge in cheap photography, and in such a manner as will satisfy the most fastidious amateur, as also instantaneous work, portraits, &c.

As photography—the youngest of the graphic arts—grows older, we observe that the line of demarcation which separates the various art processes becomes more prominent. The architect, the botanist, the naturalist, the astronomer, the physician, and all those who are engaged upon the research and study of microbes and other infinitely small things, cannot help being satisfied with the perfection reached by the modern lens.

Indeed, as far as rectilinearity, exactness of copy, and minuteness of detail are concerned, scarcely anything better could be wished for.

But this mathematical exactness and inexorable clearness at all angles, this rigorous reproduction of lines and points which are invisible to the naked eye, are not intended to please the artist, whose aim is to interpret nature (essentially a Japanese artist's aim) rather than to copy it more exactly than we see it.

And, whilst the glass-maker improved his glass, and the optician his combinations of lenses, whilst the chemist discovered new emulsions and developers, the artist strove to render nature in a broader and more personal manner, to stamp the crude outlines resulting from rectilinearity, and to give his pictures an airy aspect without departing from the truth, as supplied by photography.

He has succeeded in this by the aid of the stenope (or pinhole), and by using rough and unglazed paper, but his surest and simplest means of success is by the use of the *trousse bésicles*. Although the pinhole is perfect for monuments and lifeless landscapes, it is not suitable for portraits or animate open-air pictures, owing to duration of exposure.

Coarse paper softens the outlines and stumps details, but it can only reproduce negatives as such, without bringing into relief the main subject of the picture and without correcting any possible errors of the lenses.

The *trousse bésicles* combines all these advantages, and gives, at the same time, artistic rendering of the pinhole and the short exposure of the lens. In taking only six different numbers of *bésicles*, the picture can be taken on any desired scale (as with the pinhole), and, further, more instantaneousness (as with lens) is also procurable.

To this effect the following lengths of focus are taken, viz.:—25 cm., 30 cm., 50 cm., 55 cm., and 60 cm.

The great advantage of being able to change lenses, so as to increase the size, may become an inconvenience when inconsiderate use is made of it.

In choosing a lens with too short a focus, the picture will have an exaggerated perspective, and, in the case of a portrait, the features of the model will be deformed.

It is, consequently, always preferable to use a lens the focal length of which is equal to twice the length of the plate ; for instance, in a portrait 9×12 cm., the lens should at least have 25 cm. of focal distance, and the model should at least be four metres away from the objective.

This distance, four metres, is the shortest permissible one, and in the case of portraits, a distance of six metres would be preferable. If a larger head than the model's, as furnished by the 25 cm. lens at that distance is required, a lens with a longer focus should be used.

However, by sacrificing the perspective a little, one may reduce the distance in order to obtain very large heads, but this should not be done unless the length of the bellows prevents the adoption of other means.

Generally speaking, it is admitted that a long focus always gives the truest pictures, and no mistake will ever be made by using lenses with as long a focal distance as the available camera will allow.

Be it understood that this rule applies not only to the *trousse*. Long ago, Dallmeyer made the same remarks *re* his objectives, and, if we remind the reader of the same here, it is in order to warn him against the temptation he might fall into by being placed before so many different lenses. For landscapes, the rule is ever in favour of long focus ; the human eye cannot embrace an angle of more than 45° without displacing itself, and it is not desirable that photography should embrace more, lest the picture be false and altogether different from what was intended.

Again and again we have seen photographs of hotel reading rooms, steamer dining saloons, and warehouse façades, in which full advantage had been taken of the exaggerated perspective obtained by wide-angle lenses for the sake of the advertisement. In comparing the pictures with the originals, it is generally found that the latter are much more modest than the former.

Herewith is a table for correcting focussing. The plates are moved nearer the objective as per the indication. Measures in millimetres.

		For Sizes of Image.									
	For Infinity.	1/10	2/10	3/10	4/10	5/10	6/10	7/10	8/10	9/10	10/10
Focal length.....	200	220	240	260	280	300	320	340	360	380	400
Correction.....	4	5	6	7	8	9	10	11·5	13	14·5	16
Focal length	250	275	300	325	350	375	400	425	450	475	500
Correction.....	5	6	7	8·5	10	11	13	14·5	16	18	20
Focal length.....	300	330	360	390	420	450	480	510	540	570	600
Correction.....	6	7	8·5	10	11·5	13·5	15·5	17	19 5	21·5	24
Focal length.....	400	440	480	520	560	600	640	680	720	760	800
Correction.....	7	10	11·5	13 5	15·5	18	20·5	23	26	29	32
Focal length.....	850	495	540	585	630	675	720	765	810	855	900
Correction.....	9	11	18	15	17 5	20	23	26	29	33	36
Focal length.....	500	550	600	650	700	750	800	850	900	950	1000
Correction	10	12	14·5	17	20	22·5	25·5	29	32·5	36	40
Focal length.....	550	605	660	715	770	825	880	935	990	1045	100
Correction.....	11	13·5	16	18·5	21·5	25	28	32	36	40	44
Focal length...	600	66	710	780	840	900	960	1020	1080	1140	1200
Correction.....	12	14·5	17	20	23 5	27	31	34·50	39	43·5	48

Y. Isawa.

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Royal Photographic Society's Fortieth Annual Exhibition, will be held in the Gallery of the Royal Society of Painters in Water Colours, 5A, Pall Mall East, London, S.W.

The Exhibition will be inaugurated on Saturday, September 28, by a private view, followed in the evening by a *conversazione*. The Exhibition will remain open daily (Sundays excepted) from Monday, September 30, until Thursday, November 14. Admission (from 10 a.m. till 5 p.m.), One Shilling. It will also be open on Monday, Wednesday and Saturday evenings, when lantern slides will be shown ; admission (from 7 to 10 p.m.), Sixpence. Members have free admission at any time. They may receive twenty day and ten evening tickets for their friends, and can purchase additional tickets at half price. Members of affiliated Societies can purchase tickets at half price of their respective Secretaries. Every exhibitor receives a season ticket and a catalogue of the Exhibition.

Medals will be placed at the disposal of Judges for the artistic, scientific, and technical excellence of photographs, lantern slides, and transparencies, and for apparatus. Exhibitors who desire to do so may state whether they wish their exhibits to go before the Judges in the Art or the Technical Section, or both. The Exhibition will be conducted according to the rules adopted at the recent Conference of Judges. The under-mentioned gentlemen have been elected by the Members of the Society to act as Judges, and have consented to serve :—Art Section : Walter L. Colls ; Lieut.-Col. J. Gale ; F. Hollyer ; B. Gay Wilkinson ; W. L. Wyllie, A.R.A. Technical Section :—Capt. W. de W. Abney, C.B., F.R.S ; Chapman Jones, F.I.C., F.C.S ; Andrew Pringle, F.R.M.S.

General Regulations.

Photographs—Each exhibitor must fill up the entry form supplied b the Society, and send it to the Secretary, Royal Photographic Society, 12 Hanover-square, London, W. With any work produced by a special process of the exhibitor, information as to particulars should be given. At the back of each frame must be written the name and address of the exhibitor, with the title or description of the photograph, and the number (if there are more than one) to which it refers in the entry form. The front of the frame or picture may have the exhibitor's name, and the title of the picture, neatly inscribed upon it, *and this only*. To avoid damage to other frames, it is requested that all frames have sunken backboards with the fastening nails not projecting, and the backs covered with thick brown paper. Lantern slides will be eligible for award only when both the negatives and slides are the work of the exhibitor. Frames will be provided for them. Negatives and transparencies, photo-mechanical prints, stereoscopic work, photographs of purely scientific interest, and photographs coloured by scientific or mechanical means will be admitted. Oxford frames, photographs already shown in any public exhibition within the London postal district, and photographs coloured by hand will not be admitted. All working up of photographs by hand, except mere spotting, is undesirable, and may cause the rejection of the exhibit.

Apparatus.—Each exhibitor must fill up the entry form supplied by the Society. A removable card must be attached to the exhibit, containing the name of the exhibitor and the number to which it refers in the entry form. Attention is requested to this regulation, as, without it, the description of the apparatus may not appear in the catalogue. The exhibitor should fasten on each exhibit a small adhesive label containing his name only. No apparatus will be admitted that has been shown in the Society's previous Exhibitions unless it has some new detail. New apparatus should be *concisely* described. In all other cases a list of the novel details must be given. Apparatus that has already been shown at London Exhibitions may be refused.

Sales.—The prices of the exhibits will be published in the catalogue so far as they are furnished by the exhibitors. Exhibits not priced will be indicated as being "not for sale." Fifteen per cent. commission will be deducted on sales.

Foreign Exhibitors are invited to contribute. The Society will provide frames or portfolios during the Exhibition for approved photographs. There will be no charge for wall space.

Reception of Exhibits.—Exhibits sent by carrier must be *carriage paid*, and addressed to the Secretary, Royal Photographic Society, 12, Hanover-square, London, W., and should arrive by Saturday, September 14, at the latest, in order to ensure the delivery of the exhibits at the Gallery before closing time. No packing-cases can be received at the Gallery.

Exhibits, including pictures, negatives transparencies, lantern slides, apparatus, and appliances *sent by hand* will be received at the Gallery, 5A, Pall Mall East, *only from 9 a.m. to 9 p.m. on Tuesday, September 17, after which time and date no exhibit can, under any circumstances, be received for competition.*

Removal of Exhibits.—Exhibits received in packing-cases will be repacked and dispatched as soon as possible after the close of the Exhibition. Exhibits left at the Gallery by hand must be fetched away on the day appointed, due notice of which will be sent to the exhibitors. Particular attention is requested to the removal of exhibits on the day appointed. If not taken away then, considerable expense will be incurred in removing them from the Gallery to be warehoused. This expense will be charged to the exhibitor. Exhibitors can, by giving instructions to the Assistant Secretary, and paying the cost, have their pictures packed in a case and sent by carrier.

Charges.

The privileges mentioned below are accorded to members of the Society whose subscriptions are not in arrear, and are granted to them in their individual capacity only. A firm or company exhibiting in their corporate capacity is treated as a non-member, although one or more members of the firm may be members of the Society.

Wall Space.—No charge will be made to members of the Society. To non-members a charge of one shilling per square foot, and to members of affiliated Societies a charge of sixpence per square foot will be made for wall space. To obtain this reduction, the entry form must be accompanied by the membership voucher bearing the Affiliation stamp. The minimum charge in each case is five shillings. Lantern slides and transparencies will be charged as for pictures. Twelve lantern slides are calculated as equal to one square foot. Postal orders to pay for the wall space required must accompany the entry form, and, should any of the photographs not be accepted, the due proportion, in excess of the minimum charge, will be returned. The charge for wall space to those exhibitors who may be proposed as members of the Society before the end of the year will be remitted, and the amount paid credited to their entrance fee and subscription.

Apparatus.—The apparatus will be under the personal supervision of a competent attendant, who will be ready to furnish explanations to visitors during the whole time the Exhibition is open. The charge to members will be at the rate of half-a-crown for each piece of apparatus or square foot of table or floor space (whichever is greater), with a minimum charge of five shillings. The rate to non-members will be at five shillings, with a minimum charge of ten shillings. These charges must be enclosed with the entry form, or the exhibit will not be received. If a case of apparatus is accepted for exhibition, each item contained in it will be treated as a separate exhibit, and so catalogued and charged for, except when the items naturally form a single exhibit; as, for example, a hand camera, including the camera and lens, or an apparatus with parts of it shown separately to illustrate its construction.

Conditions.

It is to be distinctly understood that the sending of exhibits signifies acceptance by the exhibitor of the decision of the Council upon all matters connected with the Exhibition as absolute and final.

The Council do not hold themselves responsible for any damage that may happen to the exhibits while in their custody, but every precaution will be taken to ensure their safety and prompt return to the owners at the close of the Exhibition. They reserve the right to reproduce any of the pictures exhibited for the issue of an illustrated edition of the catalogue.

Optical Lantern.

Photographic lantern slides will be shown by means of the Society's optical lantern during the Exhibition. The loan of slides for this purpose is invited; they must not exceed three and a quarter inches in height, and, to facilitate selection and arrangement, they must be delivered at the Gallery not less than three days before the evening of their being shown in the lantern. If sent by carrier, they should be addressed to the Secretary, Royal Photographic Society, 5A, Pall Mall East, S.W., and they will be returned within seven days of their exhibition.

The Affiliation Committee consider that it would be advantageous to circulate among the affiliated Societies a select collection of photographs from the Exhibition. The Council, while they cannot accept any responsibility for the pictures, thoroughly approve of the proposal, and hope that those exhibitors that are approached by the Committee with reference to this matter will favourably consider the application.

Blank entry forms and any further information respecting the Exhibition, also nomination forms for membership, can be obtained from the Assistant Secretary of the Society, 12, Hanover-square, London, W.

SUMMER PHOTOGRAPHIC EXHIBITION AT THE AGRICULTURAL HALL.

Under the management of Mr. Walter D. Welford an International Photographic Exhibition was opened at the Agricultural Hall, Islington, on June 29, and will close to-morrow, Saturday, July 6. Although nominally held in connexion with a Tobacco Exhibition, the photographic display probably neither gains nor loses by the conjunction, and may fairly be said to be as well worth a visit for its own sake as any other photographic Exhibition that we can call to mind.

Mr. Welford was fortunate in being able to secure a clear space at the west end of the vast hall, which he utilised to the best advantage by hanging his exhibits on a series of improvised walls, with plenty of space between, in which one could move freely about; and, as the photographs were not at all crowded together, it became not merely easy, but positively pleasant, to examine them—a feature which can rarely be placed to the credit of an exhibition of photographs.

Here are particulars of the various competitions, which, it will be noticed, were cast in a scale of considerable enterprise and lavishness.

The Competitions.

Division A (absolutely open to the world), gold, silver, and bronze medals. —1. Landscape; 2. Seascape and Marine; 3. Hand-camera Work (direct prints only); 4. Figure Studies and *Genre* Subjects. Silver and bronze medals.—5. Beginners (who have commenced photography since June 1, 1892); 6. Ladies' Class (for ladies' work only, any subject); 7. Animal Study; 8. Smoking Picture; 9. Architecture (interior or exterior); 10. Scientific Work; 11. Instantaneous and Snap-shot Work; 12. Process Work (reproductions of negatives from nature, not copies of pictures, &c.) An optical lantern, value 6*l.* 6*s.*—13. Special Society Competition (for the best set of twelve or more prints from not less than four different members of a photographic society).

Silver and bronze medals to the two best prints in the winning set, and two bronze medals to the next two best prints, provided they are not in the winning set.

Division B (for amateurs who have not previously gained a medal or prize at a photographic Exhibition). First prize, silver medal; second prize, bronze medal.—A. Landscape (from negative not exceeding $6\frac{1}{2} \times 4\frac{3}{4}$); B. Marine (from negative not exceeding $6\frac{1}{2} \times 4\frac{3}{4}$); C. Portraiture (for negative not exceeding $6\frac{1}{2} \times 4\frac{3}{4}$); D. Architecture and Buildings (from negative not exceeding $6\frac{1}{2} \times 4\frac{3}{4}$). First prize, a No. 4 folding "Kodet" hand camera, value 5*l.* (presented by the Eastman Photographic Materials Company, 115, Oxford-street, London, W.); second prize, bronze medal.—E. Snap-shots (set of six prints from negatives not exceeding 5×4 inches. Any subjects). First prize, a new pattern "Ideal" hand camera, value 5*l.* 5*s.* (presented by Adams & Co., 81, Aldersgate-street, and 26, Charing Cross-road, London); second prize, bronze medal.—F. Holiday Work (set of six prints from negatives not exceeding $6\frac{1}{2} \times 4\frac{3}{4}$, taken upon a holiday trip or tour). First prize, a "Vedette" hand camera, value 5*l.* 5*s.* (presented by the Vedette Camera Company, Greek-street, Soho, London, W.); second prize, bronze medal. —G. Frost and Ice Studies (set of four prints from negatives not exceeding 5×4, of skating, curling, games on the ice, snow and ice formations, &c.).

Division A.

The awards were as follows:—

Class I. (Landscape).—Gold medal, W. Thomas, *Disturbed;* silver, A. R. F. Evershed, *On the Medway;* bronze, Henry Troth, *A Wind-swept Coast.*

Class II. (Marine).—Gold medal, withheld; silver, Henry W. Bennett, *A Summer Evening;* bronze, W. Thomas, *Sunset;* commended, John H. Gear, *At the Mouth of the Yare.*

Class III. (Hand Camera).—Gold medal, Walter D. Welford, *Washing Day;* silver, John H. Gear, *An Evening Calm and Cool;* bronze, Mrs. Welford, *A Gentle Summer Breeze.*

Class IV. (*Genre*).—Gold medal, Percy S. Lankester, *A Greek Study;* silver, Hall Edwards, *Helluo Liborum;* bronze, Chas. E. Fairman, *Grief.*

Class V. (Beginners).—Silver medal, Geo. L. Wilms, *'Twixt Dusk and Dark;* bronze, W. Smedley Aston, *A Portrait.*

Class VI. (Ladies).—Silver medal, Miss A. Godley, *Feeding the Fowl;* bronze, Mrs. Welford, *Going to Market;* commended, Dorothea Maw, *A Gamekeeper's Cottage.*

Class VII. (Animals).—Silver medal, withheld; bronze, J. C. Stockholm, *Five Good Boys.*

Class VIII. (Smoking Picture).—Silver medal, Dr. Hall Edwards, *I Look on my Pipe;* bronze, George Hana, *Oh! Gay Paree.*

Class IX. (Architecture).—Silver medal, E. R. Bull, *A Fourteenth Century Hall;* bronze, C. H. Oakden, *North Isle, Ely.*

Class X. (Scientific).—Silver medal, withheld; bronze, Arthur Jane, *Photos in Colours.*

Class XI. (Instantaneous).—Silver medal, withheld; bronze, Percy Lankester, *After Inspection.*

Class XII. (Process Work).—No awards.

Class XIII. (Special Society Competition).—Prize of Lantern to the East London Photo Society; silver medal to G. E. Bennett, *Sunshine and Shadow;* silver to A. Copping, *By the Wayside;* bronze to Thos. Lee

Syms (Leigh Society), *Fishing;* bronze to Howard Esler (South London Society), *Bachelor Life.*

DIVISION B.

Class A. (Landscape).—Silver medal, Hugo Meynell, *Evening;* bronze, E. C. Lawson, *The Marsh Brook.*

Class B. (Marine).—Silver medal, withheld; bronze, F. W. Scott, *Bergen Harbour.*

Class C. (Portraiture).—Silver medal, J. C. Richards, *Portrait Study;* bronze, Mrs. E. C. Trench, *Mandoline Player.*

Class D. (Architecture).—Silver medal, Gustave Gillman, *Court of the Mosque;* bronze, T. Lee Lloyd, *Salisbury Cathedral.*

Class E. (Snap-shots).—Hand Camera, Chas. F. Inston, Set B; bronze medal, Gustave Gillman, *Provinces of Almeria.*

Class F. (Holiday Work).—Hand Camera, Hugo Meynell, Set of 6; bronze medal, Gustave Gillman, Set of 6.

Class G. (Frost and Ice).—Hand Camera, Dr. A. H. Williams, Set of 4; bronze medal, W. Naylor, Set of 4.

Mr. Horsley Hinton and Mr. H. P. Robinson acted as Judges in Division A.

The claim of the Exhibition to be regarded as international may be judged by the light of the fact that exhibits came in from Australia, Austria, Canada, Denmark, Germany, Holland, India, Italy, New Zealand, South Africa, Spain, Sweden, Switzerland, and the United States, in addition, of course, to the United Kingdom, a noticeable feature being the appearance of a great many competitors new to the battle-grounds of photographic exhibitions.

Regarding the display as a whole, it must be pronounced as uniformly good throughout, with no pretensions of any epochal or strikingly out-of-the-way work. Particularly interesting was the society competition, in which the Cape Town, Eastbourne, East London, Leigh (Lancashire), South London, and Walsall Societies engaged. The victors proved to be the East London, from whom came a collection of work which surprised us by its strength and excellence. Mr. A. G. Cooke contributed an interior, *The Crypt Chapel, St. Paul's,* a well-executed piece of work; a *Study of Winter,* a snow-covered landscape, excellently interpreted; and Mr. E. Atkinson, a charming view, *Now Came Still Evening On,* having great beauty. A so-called *Moonlight Effect,* fishing boats on a calm sea, by Mr. C. Tylee, simply relied upon a deep blue tone for its effect, which was consequently not realised. Mr. G. S. Pasco and Mr. G. E. Bennett also sent work of notable excellence. The South London Society was represented by many charming works, chiefly made familiar to us at their last Exhibition, by Mr. Oakden, Mr. Bull, Mr. Whitby, Mr. Dickinson, and others, so that a second reference to them is not necessary. The Walsall Society's exhibit included pleasing landscapes, but scarcely call for further mention. Mr. Ellis Kelsey was undoubtedly the most prominent and successful of the Eastbourne men, his *The Glowing Western Sky,* with its effect of sunset, being a singularly able bit of work. *A Drawing-room Portrait,* of a gentleman, by Mr. Hollway, was an example of careful lighting and exposure, which, combined, produced an agreeable piece of at-home portraiture. The Cape Town Photographic Club's exhibit indicated much promise, but that of the Leigh Society merited great praise, Mr. Lee Symes shining conspicuously with some really first-rate efforts, among them being a group of card-players (*Hearts are Trumps*), cleverly posed, and *Fishing,* a girl attentively watching a lad fishing on the banks of the river. This, alike in naturalness of effect and photographic technique, did its author very much credit. The remaining exhibits of this Society, chiefly landscapes, were of high quality.

The remainder of the photographs are hung sectionally, chiefly with reference to their nationality, those securing prizes being also placed by themselves.

Among the foreign exhibitors are many whose names and works are new to this country. Messrs. Julius & Pieperhoff's costume studies were of great delicacy and refinement, and several excellent examples of landscape work came from Mr. O. Nieport, Mr. Gustave Gillman's small studies illustrating *A Trip to Elche,* and the same gentleman's rendering of an interior (*Hall of Repose*), attesting great artistic skill. This section was remarkable for its uniform level of good quality, which renders criticism a little difficult, if not needless. Chiefly noticeable among the contributions of the American contingent are some works highly suggestive of well-known photographs previously sent to this country. For example, Mr. G. L. Wilms' *Snowy Morn,* a footstep-marked foreground of snow leading up to a dark clump of trees, is very reminiscent of Eickemeyer's *Sweet Home,* while Mr. Post's *Summer Days* reminds us much of the formerly named gentleman's charming *Lily-gatherer,* a lady leaning from a boat gathering lilies. For all that, there is some excellent work in this section, although we take exception to the massive plumpness of the recumbent figure of the young lady in Mr. E. L. Ferguson's *Modern Psyche.* The figure, as it were, looks "all of a heap."

More or less well-known works occupy the section devoted to British exhibitors, Mr. H. W. Bennett, Mr. E. R. Bull, Mr. Lankester, Mr. Gear being well represented. A word of praise is due to Messrs. Chaffin & Son for an excellent study, *The Fortune-teller,* the figures of the ladies being gracefully and naturally disposed. We have before admired Mr. F. H. Worsley Bennison's series of twelve grand sea studies, printed (apparently) in blue carbon; they form a capital set. Mrs. Welford has a pretty and pleasing study of a charming child *Blowing clocks 'mid summer breezes,* little Miss Welford being, if we mistake not, the original. Mr. Arthur Jane's examples of colour photographs, flowers, &c., are interesting and effective, but no clue is given as to the method adopted. Dr. Hall Edwards, a prolific contributor, has some exceedingly able studies of monks varying the dull monotony of their existence by incursions into the domain of nicotiana, and right good pictures they make. Of Mr. Lee Syme's group gathered round a sick bed, *The Doctor,* we can only say that, while photographically good, it lacks every essential of *a picture.* Selections from Division B (previously unmedalled work) have a separate screen to themselves.

Criticism is disarmed by the plan of placing all the prize pictures together, as the opportunity of making comparisons is only to be indulged in at enormous perambulatory labour; consequently we shall content ourselves with remarking that an award went to Mr. Jane for his colour photographs of flowers, Mr. Hana being similarly distinguished for a coloured photograph of a lady, *Oh! Gay Paree!* For a hand-camera exposure Mr. Welford's picture of an old dame at the wash-tub under a projecting part of a house was remarkably successful.

MOVING OBJECTS AND PICTORIAL PHOTOGRAPHY.

[North Middlesex Photographic Society.]

THE substitution of a mechanical shutter for the lens cap opens new possibilities in pictorial photography; it not only permits the successful rendering of subjects that could not be attempted without its aid, but in addition gives greater certainty and control in ordinary work, and increased power of utilising chance materials that may be met with in any excursion with the camera.

A mechanical arrangement for making the exposure is absolutely necessary for all those of shorter duration than one second, and a decided advantage for those extending to four or five seconds, or even longer. It is perhaps advisable to consider first the circumstances and conditions of working when it is either necessary or desirable, from the nature of the subject, to give such an exposure as to require the use of a shutter, and afterwards study the mechanical aspect of the question and the new conditions involved. Primarily, rapid exposures are necessitated by wishing to include as part of the composition some moving object, but in addition the best results in landscape are to be obtained by the employment of a fairly large lens aperture and a moderately quick plate, and it follows that in most cases the exposure must be very short or the plate will be over-exposed; and these conditions favour availing ourselves of the advantages that moving objects will frequently confer, and allow subjects to be successfully treated that otherwise would not be found so desirable pictorially, or perhaps even available for treatment at all.

There are not many subjects selected by those who practise pictorial photography that require for the purpose of obtaining sufficiently sharp definition a smaller stop than *f*-16; even if lenses of as long as 11 in. or 12 in. focus are used, and with plates registering in speed eighteen or nineteen Warnerke such as Edwards's medium isochromatic, Ilford ordinary, or Paget thirty times, exposures will, under the best conditions of working, frequently range between one-eighth and half a second. This advocacy of a moderately large stop is not intended to be understood as in any way favouring either naturalistic focussing or the "fuzzy" school; the argument that only differentially focussed photographs, or those having no sharpness of definition at all, are artistic and idealistic, is absurd and untenable. Pictorial qualities and idealism are, strictly speaking, independent of sharpness of definition; they are at least equally possible in a sharply focussed photograph as in one that is badly defined. In the latter the peculiar destruction and distortion of the photographic image that results from its being badly out of focus will frequently detract from the good qualities that the picture may have, by introducing a disturbing element where the eye should naturally rest. There is, however, a degree of definition obtainable in a negative that is never thoroughly reproduced in a print on matt-surface paper, and even so far as reproduced, not evident at the ordinary distance of looking at the picture. The final result, that is, the print and the conditions under which it is to be seen, must determine the degree of sharpness necessary, and the largest aperture consistent with this should be used, as there are other desirable qualities in pictorial work that are, by reason of the mechanical limits to the conditions of working, more easily secured with a large stop than a small one, or with the latter frequently impossible of attainment.

The subjects in which moving objects form any important part are broadly divided into two classes: first, those in which figures, animals, or anything moving comparatively slowly are introduced as accessories to improve or complete an otherwise imperfect picture; and the second, those in which the representation of something in more or less rapid motion is the subject and aim of the work. The considerations involved, and the conditions of working differ so far as to render it desirable to study them independently, though occasional subjects may partake of the character and difficulties of both, and necessitate the sacrifice of some point otherwise important.

The first group of subjects will include landscapes with figures, cattle, or other animals; river scenes with figures, laden barges, or occasional boats; a stream or village pond with a few ducks or children at play, and such compositions that require some form of life or movement to

complete them. It will also comprise occasional landscapes in windy weather, or under such circumstances that a characteristic movement of foliage, or reeds in the bed of a stream, can be expressed by means of a short exposure, a quarter of a second for example, *made at the right moment* with a mechanical shutter, where the longer time and the greater difficulty of working with the cap would frequently prevent the desired effect from being secured.

The general principle that should govern the introduction of figures, &c., into landscapes or similar compositions, or their omission, is expressed briefly by a phrase previously used, that is, they should be there to complete or improve an otherwise imperfect picture. This will probably be readily conceded, the differences of opinion commencing with when the composition is or is not improved, and on this point the artistic taste of the worker or its absence will generally make itself evident. It is difficult to frame rules that could be of any value; in fact, it might almost be said that those who cannot appreciate in most instances whether figures are a desirable addition, or those available suitable, cannot be taught, as the power of appreciation is of infinitely greater value than attempting to mechanically follow a more or less arbitrary set of rules, general principles can be indicated and nothing more.

Some subjects are far better without figures of any kind; the associations of the scene must determine this. On the other hand, a few country cottages with no sign of life would suggest the desolation of a deserted village rather than the scene as it would most frequently appear.

Most landscapes are probably better for the addition of suitable figures or other indications of life; but securing those really suitable, and treating them successfully, is sometimes a difficult task. It is self-evident that the presence of inharmonious figures will hopelessly ruin instead of improving the composition. To ensure success, they must be associated with the scene, their position carefully determined (mostly in the middle distance), so as to appear in correct proportion, and so engaged as to suggest that their presence is simply the ordinary course of events, and not that they are just posed for the occasion never to appear there again. In most cases, the posed model should be avoided if possible, for, unless both photographer and model be specially good in arranging and posing, there is always a risk of an artificial appearance that is fatal to success. Frequently those figures that most naturally suggest themselves as being associated with the surroundings will appear in the ordinary course of their daily work, and by the exercise of sufficient patience in waiting for them, and the careful employment of a slow shutter, can be included, unconscious of the fact that their image is being recorded.

(*To be continued.*) H. W. Bennett.

SEASONABLE NOVELTIES.

By Perken, Son, & Rayment.

We have recently inspected a series of really effective and inexpensive hand cameras now being introduced by Messrs. Perken, Son, and Rayment. These are of very small size, and modelled in accordance with the modern requirements of the snap-shottist; but at the same time these instruments are also calculated to satisfy the most exacting disciple of the old rigid stand school, since they all possess means of adjusting the lens so as to project a sharp image upon the focussing glass provided. All possess the necessary means for attachment to the tripod stand. The first of the series introduced to our notice was included in a 30*s.* outfit for youthful beginners. It is covered with black, hard-grained leatherette, and has a double dark slide of sound and practical workmanship. The Achromatic View Lens is mounted substantially in highly finished brass, and arranged to focus objects from five feet to infinite distance. It covers the plate $4\frac{1}{4} \times 3\frac{1}{4}$ very amply, and with a marginal definition far beyond what the price would lead one to expect. A suitable shutter is fitted to it. This outfit includes a strong and rigid tripod stand, one dozen rapid dry plates, some printing-out paper, chemicals for making negatives and prints, tray, graduated measure, printing frame, &c., enclosed in a strong wooden cabinet. Altogether we regard it as thoroughly practical, durable, and excellent value.



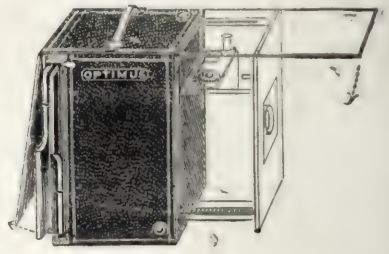
Another hand camera by Perken, Son, & Rayment is styled the Ubique. It is a very great improvement on the model they have sold under the same name during the last three seasons.

A rack-and-pinion focussing arrangement actuated from outside the instrument is now added, as well as a really efficient roller-blind shutter.

The three double dark slides and focussing screen are contained within a very neat black leather exterior. The necessary means to attach to a tripod stand are provided.

The instrument is fitted at the choice of the purchaser with an achromatic view lens, 55*s.*, or a rapid rectilinear at 80*s.*

Still another camera, the Optimus Camera de Poche, for pictures $4\frac{1}{4} \times 3\frac{1}{4}$ quarter-plate. It is covered with durable hard-grained leather; outside dimensions, $3\frac{3}{4} \times 4\frac{5}{8} \times 5$ inches. Price, complete with three double dark slides, 6*l.* 6*s.* Great ingenuity has been displayed in devising the form of this instrument. It is at once the quickest to open and to reclose, as well as the smallest camera which allows a full quarter-plate picture to be taken.



The front flap when closed protects the lens and Thornton shutter, and when the instrument is in use the flap forms a sky shade.

Turning the milled button at the side is the only movement necessary to open out the instrument preparatory to taking a photograph, which movement at the same time includes the necessary adjustment of focus ensuring absolutely sharp definition. To reclose the camera the milled head or button requires similar rotation, but in the opposite direction.

The shutter is one of the most modern, of the roller blind type, with adjustment for varying speeds. The lens covers very amply, and gives superb definition. It works with the large aperture of *f*-8, is of the extra rapid Euryscope type, mounted in aluminium, and has an iris diaphragm fitted.

Messrs. Perken, Son, & Rayment have also submitted for examination a rapid doublet lens of their manufacture, suited for quarter-plate work, and particularly designed for hand or detective cameras.

The mount is of aluminium, with an iris diaphragm, and is reduced to a minimum both as regards weight and bulk.

The lenticular components are constructed so as to give a wide visual angle, combined with great rapidity (*f*-8) and sharp defining power.

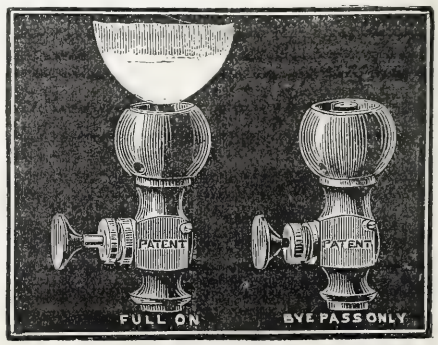
On the mount $4\frac{1}{4} \times 3\frac{1}{4}$ inches is engraved as the area the lens covers. We, however, find the circle of light it projects is equal to fully six and three-quarter inches diameter. This is a highly elegant optical production.

Our Editorial Table.

Messrs. W. Butcher & Son, Blackheath, S.E., have submitted samples of two new photographic requisites they have placed upon the market. One of these is a Magnum Primus Finder, which consists of an unusually large concave lens, fitted in a light aluminium frame, which is placed in a moment on the top of the camera, and which, when not actually in use, is placed away in a neat pocket case, as shown in the illustration.



Another novelty, as also shown by a cut, is a dark-room gas tap, which differs in certain respects from



others which we have previously noticed. In this, the change from the gas full on to full off, all but the faint and unseen glimmer from

the byepass, is effected by the mere pushing in of the handle projecting at the side. This is a species of controlling the lighting in the dark room that meets with our high approbation.

Fallowfield's Indestructible Photographic Labels.

All sets of photographic labels are very much like each other; but those of which samples have been received from Mr. Jonathan Fallowfield differ from most others in that they are indestructible, neither acid nor water having any effect upon them. This ought to be considered as a veritable boon. The directions for applying them to the bottle are, to clean this latter at the place where the former is to be affixed, and wet the bottle with a sponge, using cold water, then apply the label dry, without any adhesive substance, and rub with a soft cloth until every part is in close contact with the glass. Price 6*d.* per box of thirty-six.

Tourist Guide to the Continent.

By Percy Lindley.

This *Guide*, by Percy Lindley, together with *Walks through Belgium*, by the same author, contains a vast amount of useful information for the intending tourist, compressed in brief space. There are not only maps and plans of cities, but also numerous engravings of buildings. Mr. Lindley has so long proved himself to be a reliable writer on the topography of the Continent that one may feel quite safe under his guidance.

Lantern Slides: How to Make Them.

By A. R. Dresser. London: Jonathan Fallowfield.

This, the third edition of a useful pamphlet, is revised and written up to date by S. Herbert Fry. We have here hints how to make slides by direct contact with the negative in a frame; also by copying in the camera. Separate chapters are devoted to the printing in of clouds, to developing, intensifying, toning, and mounting. One cannot read a brochure of this kind without learning at least something from it. Price 6*d.*

Specimens of Ceramic Photographs.

Morgan & Kidd, Richmond, Surrey, S.W.

Messrs. Morgan & Kidd have shown us specimens of their work in photo-ceramics, a branch of photography they have recently with characteristic enterprise engaged in, and upon which we congratulate them. The examples (portraits) before us are of singular beauty and richness, the tones of the images being both pleasing and effective, while their total freedom from minute defects is a tribute to the care and skill exercised in their preparation. It is impossible to be otherwise than charmed with photographic positives of this kind, and it is to be hoped that they are destined to be popular among the general public, and that, therefore, the efforts of Messrs. Morgan & Kidd to promote a taste for imperishable ceramics will result successfully.

Higgins' Photo Mounter.

Chas. M. Higgins & Co., 106, Charing Cross-road, W.C.

This new adhesive is not a flour or starch paste, but is rather a vegetable glue. Unlike all starch and flour pastes, it is claimed that it is a perfectly homogeneous combination and solution, and not only is proof against decay, but the water will never separate from the body of the adhesive in the jar, and dry out, leaving the body stiff and hard, as occurs in some pastes. We have had a sample bottle of the photo mounter in use for nearly a month, and can speak highly as to its agreeableness and efficiency for mounting prints. It spreads with remarkable smoothness and uniformity, and apparently keeps well, not undergoing the slightest deterioration or altering from its semifluid-like consistency. It dries quickly, and its adhesive properties are remarkably good. As a preparation for the mounting of prints, it should be as popular as it is excellent.

Photography Annual for 1895.

Mr. Henry Sturmey, the editor, has in this got up a large and readable annual, which is well illustrated by prints from negatives taken by himself when on the Continent. There are several useful articles in its pages by the editorial contributors to *Photography*, and also a specially full report, of interest to astronomers, on 'The Progress of Astronomical Photography during 1894,' by Albert Taylor, F.R.A.S., &c. The subject of spectrum photography is ably handled by Captain Abney, who is more competent to treat on this topic than any one else. T. Bolas's record of progress in photomechanical printing will be read with profit, and so will the summaries by C. H. Bothamley ('Photographic Chemistry') and Chapman Jones ('Photographic Optics'). Altogether the Annual is a good one. It contains all the tables and general information usually looked for in almanacs and annuals. Price 2*s.* 6*d.* and 3*s.* 6*d.*

News and Notes.

In Mr. O'Neill's letter, in our last, Mr. Fall should have been described as Mr. Whitlock's "successor," not "Treasurer," as printed.

Messrs. Elliott & Fry, of 55, Baker-street, W., are issuing a list containing the names of about 300 gentlemen who are candidates at the approaching general election. These are included in the firm's "series of celebrities."

Messrs. Trenery & Cope, of 147, Prescot-road, Fairfield, Liverpool, have commenced business as trade printers and enlargers to the profession. They make carbon enlargements and carbon printing a speciality. We wish the new firm, both members of which were formerly connected with Messrs. Barrauds, Liverpool, every success.

Messrs. Berger & Co. write: "The London Sensitised Paper Company. As you are probably aware, we are the proprietors of the above business, and, having found it necessary to provide accommodation to meet the enormously increased demand for our sensitised papers, also for the production of collodion and gelatine printing-out papers, we have just completed an extensive range of new factories at Hampstead Heath. In future, therefore, all communications should be addressed to Berger & Co., South-hill-park, London, N.W."

Photographic Copyright.—The following advertisement appeared in *The Daily Telegraph* last week:—"Having published a book entitled *The Ameer Abdur Rahman*, containing as a frontispiece a portrait of the Ameer Abdur Rahman, reproduced from a photograph handed to us by the author, but the copyright in which is, we are now informed, vested in Messrs. Fry & Rahn, of Lucknow, such photograph having been taken at Rawul Pindi in the year 1885 by Mr. George Fry, a member of the said firm, and now of Sheffield, we undertake to sell no further copies of the book containing the frontispiece in question, and we wish to express our regret and tender our apologies to the author and proprietors of the copyright in the said photograph for having so inadvertently reproduced it. Bliss, Sands, & Foster, 15, Craven-street, Strand, London, W.C., June 25, 1895."

The Southport Social Photographic Club's Fifth Annual Exhibition will be held from October 28 to November 2 inclusive, in the Studio Rooms, 15, Cambridge-arcade, Southport. The following is the schedule of classes:—For members of the Southport Social Photographic Club only: 1. Landscape and seascape, set of four; 2. Architecture, set of four; 3. Figure studies (including groups and animals), set of four; 4. Enlargements, one only; 5. Instantaneous, set of four; 6. Still-life studies, set of four; 7. Decorative transparencies (not less than half plate), set of two; 8. Lantern transparencies, set of six. Open to all photographers: 9. Landscape and seascape, set of four; 10. Enlargement, one only; 11. Instantaneous, set of four; 12. Lantern transparencies, set of six; 13. Scientific photography; 14. Figure studies (including groups and animals), set of four. Particulars can be obtained from Mr. G. Cross, Hon. Secretary, 15, Cambridge-arcade, Southport.

Fire at a Gloucester Photographic Studio.—On Friday morning last, at about a quarter to nine, information was given at the Liverpool and London and Globe Fire Station that the studio of Mr. Pitcher, photographer, of Southgate-street was on fire. The brigade lost no time in answering the summons, and in five minutes were on the scene and at play. The flames spread rapidly, the building being chiefly of timber, and took hold of the Institute mission-room, the side of which is also of timber construction. With a plentiful supply of water the firemen worked well and got the fire under and prevented its further spread. So quickly did the fire spread that some painters who were at work at the Institute, and were at breakfast at the time in the room, did not know of the existence of the fire till they heard the water dashing against the building. Mr. Pitcher is insured in the London and Lancashire Union. The cause of the outbreak is at present unknown. The studio was completely burnt out, and the damage to the building and photographic apparatus is estimated at about 250*l.*

The annual bean feast of the *employés* of the Imperial Dry Plate Company, Limited, Cricklewood, took place on Saturday, June 29. The party left in the early morning by brake for Victoria, *en route* to Brighton, where the day was spent. Dinner was served at Mellison's Grand Café Restaurant. After the usual loyal toast, Mr. Wallace proposed "The continued prosperity of the Imperial Dry Plate Company," and coupled with it the name of its chief, Dr. Acworth. The toast was heartily responded to by the company with musical honours, and Dr. Acworth, in reply, thanked them for the way in which they had received the toast, and expressed the gratification it gave him to meet them on such a pleasurable occasion. He took the opportunity to return them his best thanks for the hearty and loyal manner in which they had assisted him in his work at Cricklewood. He was very pleased, he said, to announce to them that the current half-year had been the most prosperous that the Company had experienced, and this, he thought, should stimulate each of them to still further efforts, so that this success might continue and increase from year to year. Favoured with ideal weather, the party spent the day in a most enjoyable manner.

MESSRS. ARCHER & SONS, Lord-street, Liverpool, write: "We have been busy altering our premises. The new portions, Nos. 47 and 49, knocked into one, are quite finished, and everybody says makes a fine shop or showroom. The old portion, No. 43, is partly refitted with new show-cases for photographic cameras and appurtenances; but all this part is not yet completed, though nearly so. We have had so much to do in this connexion that our time has been taken away from some new things we were bringing out, such as new sets of slides of the city of Liverpool, and its shipping, &c. We have, however, taken many new views, especially of the Atlantic liners at the great landing-stage, first train to the new Riverside Railway Station, &c."

RECENT PATENTS

APPLICATIONS FOR PATENTS.

No. 12,375.—"Improvements in the Apparatus used for obtaining Photographs." C. H. ADKINS.—*Dated July*, 1895.

No. 12,398.—"An Improved Process of Dyeing with Photographic Mordanting."—J. HELOUIS and C. DE S. PÈRE.—*Dated July*, 1895.

No. 12,426.—"The Water or Spirit or Liquid Magnifying Lens for Reading Glasses, Photographic Lenses, and other similar purposes for which a Magnifying Power is required." S. J. SMALL.—*Dated July*, 1895.

No. 12,458.—"Improvements in or relating to Photographic Cameras." THE EUROPEAN BLAIR CAMERA COMPANY, LIMITED, and T. H. BLAIR.—*Dated July*, 1895.

No. 12,488.—"Improvements in the Construction of Apparatus for Washing and Draining Photographic Prints and Plates." G. F. WYNNE.—*Dated July*, 1895.

No. 12,515.—"Improvements in Photographic Printing Frames." E. MOSELY.—*Dated July*, 1895.

No. 12,526.—"Improvements in Photographic Apparatus for Changing Sensitive Surfaces arranged as a Pack." J. D. LYSAGHT.—*Dated July*, 1895.

No. 12,567.—"An Improved Method of Obtaining Stereoscopic Photographic Pictures." J. B. KING and F. R. POOL.—*Dated July*, 1895.

PATENTS COMPLETED.

PRODUCTION OF COLOURED PHOTOGRAPHIC PICTURES BY MEANS OF DIAZO AND TETRAZO COMPOUNDS.

(Communicated from abroad by the Actien Gesellschaft für Anilin Fabrikation of Berlin, in the Empire of Germany.)

No. 10,766. CHARLES DENTON ABLE, 28, Southampton-buildings, Chancery-lane, London.—*April* 13, 1895.

IN the Specification No. 7453 of 1890, the production of coloured pictures by means of primuline and bases of a similar constitution is described. The pictures were obtained by exposing the diazo body under a positive to the light, and subsequently combining those parts of the diazo body which were not decomposed by the action of light with an amine or phenole of the dyestuff.

My foreign correspondents have now found a new process for the production of coloured pictures by means of diazo compounds. According to this process, the diazo body is exposed to light under a negative, and the decomposition products formed by the action of light, for example, naphthol, when diazo naphthaline is exposed, are then combined with diazo bodies.

The new process may be regarded as the inversion of that described in the Specification No. 7453 of 1890 above referred to. In the primuline process, the diazo compound, which is not transformed by the action of light, yields the image; whereas, in the new process now described, the products, transformed by the action of light, serve to produce the image.

The following general directions may be given for the carrying out of the invention.

The duration of the exposure to light depends on the nature of the diazo compound used—that is to say, on its greater or less capability of being decomposed by light. The tetrazo compound of diamidostilbene, for instance, is decomposed by an exposure of a few minutes; the tetrazo bodies of diphenyl or diphenol ethers are somewhat more stable. On the other hand, several diazo compounds must be exposed half an hour or more in order to complete the decomposition.

According to the nature of the diazo compound employed, this may be directly fixed on the layer (paper, wood, &c.), or the layer may be first made to imbibe the amine to be diazotised, and by means of nitrous acid the latter may be afterwards transformed into a diazo compound.

In the first place, the diazo body, such as it is obtained by the diazotation of the amines, may be used directly, or the diazo compound or its salts may be separated, and, by redissolving the latter, the sensitising solution may be produced. If the diazo body allows of the separation, the latter process is the more advantageous, because, with a purified diazo solution, better results are obtained.

Of course, a certain amount of humidity in the sensitive layer is required in order to enable the transformation of the diazo compound into phenol compound to be effected. Generally, the humidity which remains in paper, for instance, when it is dried at ordinary temperature, is sufficient.

The following examples may in detail illustrate the manner in which this invention can be practically carried out:—

1. The paper is rendered sensitive with a solution of *a*-diazo naphthaline chloride prepared in the well-known manner.

Whilst still moist, the paper is exposed for from ten to fifteen minutes to the dispersed daylight. The picture is then developed by treatment with a ten per cent. solution of the sodium acetate which has been rendered as free from water as possible. This solution dissolves the diazo compound not decomposed, which enters into reaction with the *a*-naphthol formed, yielding in this way a brown picture.

2. When in the before mentioned example the *β*-naphthylamine is substituted for the *a*-naphthylamine, a red picture is obtained.

3. In the examples 1 and 2, the same diazo body was used for the development of the picture as had served for the formation of the phenol, but the development may also be effected by means of another diazo compound. In this case, it is only necessary to remove in a suitable manner, as, for instance, by washing, the undecomposed parts of the diazo body first used.

If, in the example 2, the picture is developed with a solution of tetrazo-diphenol-ether instead of diazonaphthaline, a violet picture is produced.

It may be finally mentioned that the pictures obtained in the above described manner may be toned or may be rendered fast by a treatment with metallic salts.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, I would have it understood that I make no claim to the process set forth in the Specification No. 7453 of 1890, but what I claim is:—The herein-described process for the production of coloured pictures by preparing a photographic layer with a diazo or tetrazo compound, exposing it under a negative, and afterwards developing the image by treating, with a diazo or tetrazo compound, the decomposition product formed in the layer by the action of light.

IMPROVEMENTS IN MACHINES FOR EMBOSSING AND MOUNTING PHOTOGRAPHS.

No. 7632. CLATONIA JOUQUIN DORTICUS, 22, Spring-street, Newton, Sussex, and New Jersey State, United States of America.—*June* 1, 1895.

MY invention relates to improvements in machines for mounting and embossing photographic prints, and has reference to a machine which may be used either for mounting photographic prints, or, by the use of proper dies, may be used for embossing photographs, or the machine may be used for both purposes, as may be desired.

The object of the invention is to provide a machine for these purposes, in which the parts are of such construction that an equal pressure will be distributed over the entire surface of the photographic film while being mounted or embossed; further, to provide a machine for these purposes which may be operated with rapidity and ease; and, further, to provide a machine which will be the embodiment of simplicity, strength, and durability, and which can be produced at a very small cost.

To attain these objects, the invention consists in the several novel arrangements and combinations of parts to be hereinafter fully set forth and finally embodied in the clauses of the claim.

[The specification is illustrated by drawings.]

The claims are:—1. A machine for mounting and embossing photographic prints consisting essentially of a bed plate, a female die on said bed plate, a pressure bar hinged to said bed plate, a male die on said pressure bar, and means for causing the locked engagement of said pressure bar with the bed plate, consisting of a lever pivotally connected with the pressure bar, provided with a holding jaw at or near the fulcrumal point of the pressure bar, and a holding pin on the bed plate with which said jaw is adapted to be engaged. 2. A machine for mounting and embossing photographic prints, consisting essentially of a bed plate, a die on said bed plate, a pressure bar provided with a die and hinged to said bed plate, stops or projections on said bed plate and said pressure bar, to retain the same in its raised position, and means for causing the locked engagement of said pressure bar with the bed plate, consisting of a lever pivotally connected with the pressure bar, provided with a holding jaw and a holding pin on the bed plate. 3. A machine for mounting or embossing photographic prints, comprising therein a bed plate, having a recessed portion, a pressure bar pivotally connected with said bed plate, a die on said pressure bar, and a die in said recessed portion, said die having centrally arranged bearings, whereby said die is adapted to oscillate in said recessed portion, to bring the faces of the dies in perfect contact when the pressure bar is lowered.

AN IMPROVED MAGAZINE FOR PHOTOGRAPHIC DRY PLATES OR NEGATIVES.

No. 13,899. JOHN BOULTBEE BROOKS, Criterion Works, Great Charles-street, Birmingham, Warwickshire.—*June* 1, 1895.

I WILL first describe my invention as applied to a magazine for use in a dark room for the purpose of holding dry plates or undeveloped negatives, and delivering the same one at a time when required.

To this end I construct a box which opens at the top and bottom. The top of the box is closed by a suitable cover or lid, which has its edges rebated to fit into the top of the box, and which if hinged may be kept closed by a spring. The bottom of the box is hinged at the back, thus forming a door which partially opens downwards. This door is kept closed by a lever spring affixed in a convenient position at the back of the box, and is opened in the manner hereinafter described. The interior of the box is made of the requisite size to take the plates easily, but not too loosely, the plates being put in from the top of the magazine, and lying flat one upon another.

I construct the apparatus for delivering the plates as follows: Across the front of the box, inside and near the bottom, I place a spindle on which are fixed two circular discs, through which the spindle passes concentrically. In each of these discs I make a notch, which has one side directed radially to the circumference of the disc, and the other side tangentially thereto. These discs and their spindle have about half their substance recessed into the thickness of the front of the box. The spindle passes out through one side of the box, and is furnished with a handle or key wherewith to turn it, and also has a lever fixed to it, and lying close to the side of the box, and pointing in the same direction as the notches on the discs.

This lever is for the purpose of opening the bottom door of the magazine, upon which I provide a suitable projection or plate for the lever to come into contact with.

On the side of the box, near to and above the spindle, I place a stud which limits the extent of backward rotation of the lever and spindle.

Across the back of the box I place another spindle, which carries upwardly projecting arms with a rebate cut in their upper extremities.

These arms are partly recessed into the back of the box, the recess being large enough to permit of the arms being pushed backwards as hereinafter mentioned. The arms are pressed forward by suitable springs, but have a stop to prevent more than the lower edge of the rebate from projecting into the box. The magazine is provided with means for hanging on a wall or other suitable place in the dark room, and, so as to necessitate only a slight opening of the bottom door in delivering a plate, the hanger is so made that the box is tilted forwards.

The action of the parts is then as follows: Any number of plates may be placed within the box till full, and on the lid being closed the box is light-tight. The plates lie one upon another, the lowest having its front edge supported upon the two discs fixed on the front spindle, and its rear edge upon the rebates of the arms on the back spindle. To deliver a plate, the handle should be first turned till the lever which is to open the bottom door of the box points upwards, and comes into contact with its stop; the notches in the discs are in the same direction as the lever, consequently are upwardly directed, and the front edge of the lowest plate drops into them. The handle is now rotated in the contrary direction, carrying round the discs and the notches, and with them the front edge of the plate, the supporting arms at the back edge of the plate yielding to allow of this action.

The rotation of the handle continuing, the notches turn till the front edge of the plate drops out of them, and the plate slips bodily forward, and falls flat on the bottom door of the box. The same motion of the handle also carries round the lever, which, coming into contact with the projection or plate on the bottom door, presses it downwards, and, the door being thus opened and sloping, the plate slides out into the hand held to receive it. On the handle being released, the door is at once closed by its spring.

I adapt the same action to a magazine camera, in which case I place each plate in an opaque sheath with the front cut away to admit of exposure, or a sheet of opaque material may be placed between each plate. The plates are arranged upright in the magazine of the camera, and are pressed forward against the discs by a spring, the spindle with discs being at the lower edge of the front plate, and the spindle with yielding arms at its upper edge.

After a plate has been exposed, it is delivered from the magazine by rotating the spindle and discs, when it falls by the help of suitable guides into a receptacle provided in the camera.

A door is opened by a lever and closed by a spring in a similar way to that in the dark-room magazine; but, in the camera, this door is not placed on the magazine, where it would interfere with the exposure, but is placed on the receptacle into which the exposed plates fall.

As a modification of the magazine for dark-room purposes, I make the magazine box upright, with a fixed sloping bottom.

Across the back of the box, inside, and near the bottom, I place a small ledge, which has a rounded or sloping edge to prevent the plates binding on it, and immediately above the ledge I make a recess sufficiently wide to admit the edge of one plate only at a time. If desired, this recess may have a spring to assist in expelling the plate therefrom. Across the front of the box, inside, and directly opposite to the ledge at the back, I place another ledge. Immediately above this ledge I pierce the front of the box, and insert one or more push buttons, studs, or plates, sufficiently long to push a plate off the front ledge when pressed in level with the front of the box. These push buttons are attached to and operated upon by the door hereinafter mentioned. The exit for the plates is a slit cut in the front of the box, level with the bottom. I close this orifice, and also operate the push buttons by a flap or door, which I hinge to the front of the box above the push buttons which I attach to it.

The door is kept closed by a lever spring attached to the front of the box, and is opened by a knob or handle affixed to it. The bottom and sides of the box are extended and rebated to make a light-tight joint with the door. The action of this form is as follows:—Supposing the door or flap of the box to be closed, and the magazine then filled with plates, the lowest plate is supported at the back by the rear ledge, and at front rests upon the push buttons. To deliver the first plate, open the door or flap, which, withdrawing the push buttons, allows the front of the plate to fall on the ledge. Upon closing the flap, the push buttons are pressed inwards, and push the back edge of the plate into the recess; but, at the same time, the front edge is pushed from its ledge and falls, and the plate slips (and, if a spring is provided in the rear recess, is thrust) forward, and falls upon the sloping bottom of the box, and, upon the flap being raised, slips out into the hand held to receive it, and, the handle being released, the flap is closed again by its spring. After the first plate, only one opening and closing is needed for each plate, as each time the door closes it causes a plate to drop on the bottom of the box ready to slip out next time the door is opened.

IMPROVED MEANS FOR AND METHOD OF SEPARATING PHOTOGRAPHIC GELATINE FILMS FROM THEIR SUPPORTS OR BASES, AND ENLARGING THE SAME.

No. 15,217. ALBERT JOHN EVES HILL, Palmer-crescent, Kingston-on-Thames, and ALFRED ALLEN BARRATT, Cleygate Vicarage, Esher, both in the County of Surrey.—*June* 1, 1895.

THIS invention relates to improved means for and method of separating gelatine films from their supports or basis and enlarging the same.

For this purpose we mix together a quantity of citric or other vegetable acid of a like nature and a quantity of an alkaline fluoride such as fluoride of sodium.

The proportion of citric acid employed varies according to the extent of enlargement required; for instance, if it be desired to enlarge the gelatine to double its area, a mixture of the materials in or about the following proportions will be found suitable:—

Fluoride of sodium	1 drachm.
Citric acid	9 drachms.

If, however, a greater enlargement is required, the proportion of citric acid must be increased, and, if it be desired to obtain an enlargement of less area or merely to remove the film from its support or base, the proportion of the acid must be reduced.

When it is desired to employ the above mixture, we dissolve the same in water in a suitable bath in or about the proportions.

Fluoride of sodium	1 drachm.
Citric acid	9 drachms.
Water	7 ounces.

Into the solution thus formed the plate, which has been well washed after development and fixing in the ordinary manner, is immersed.

The gelatine will, in the course of a few minutes, be observed to frill, and finally leave the glass. The film is then transferred to a larger dish containing water, in which the larger support is placed. The film expands in this water bath and is left for a time depending to some extent on the temperature, but principally on the developing agent used. The most suitable agents in developing for this purpose are those in which an alkaline carbonate is used as accelerator.

It will be readily understood that circumstances may render it necessary to vary such proportions; for instance, the quantity of water will to some extent depend on the hardness of gelatine used in the manufacture of the dry plate; the softer the gelatine, the greater should be the quantity of water, but the proportions above given will be found suitable for most plates.

Though we prefer the use of citric acid as the active enlarging agent, other acids may be used, such as tartaric or acetic acid. In order to compensate for a slight loss of density caused by expansion of the film, we may add mercuric chloride or other suitable intensifying medium to the water constituting the cold-water bath referred to above in proportion varying according to the quality of negative required, as in ordinary photographic procedure.

Having now particularly described, and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare what we claim is:—1. Separating photographic gelatine films from their supports, and enlarging the same, by means of an alkaline fluoride, vegetable acid and water, with or without an intensifier, substantially as described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
8	North Middlesex	
8	Richmond	
9	Birmingham Photo. Society	
9	Hackney	
9	Manchester Amateur	
9	Oldham	Excursion: Peel Park Museum, Manchester. Leader, T. Widdop.
9	Paisley	
9	Royal Photographic Society	
9	Stockton	
10	Croydon Camera Club	*A New Anti-halation Plate.* C. F. Oakley.
10	Leytonstone	
10	Munster	
10	Photographic Club	
10	Southport	
10	Stockport	
11	Glossop Dale	
11	Hull	
11	Liverpool Amateur	Excursion: Broxton and Carden Hall. Leader, J. Sirett Brown.
11	London and Provincial	
11	Manchester Photo. Society	
11	Oldham	
12	Cardiff	
12	Croydon Microscopical	
12	Halifax Camera Club	
12	Holborn	
12	Maidstone	
13	Croydon Camera Club	Excursion: Hever, for Chiddingstone and Penshurst. Leader, W. Burn.
13	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

JUNE 27,—Mr. J. S. Teape in the chair.

Mr. A. L. HENDERSON showed some negatives from which green fog had been removed by holding the plate while wet over a solution of cyanide of potassium. He also showed negatives produced on an emulsion having less than a grain of silver to the ounce, and pointed out the absence of halation.

Mr. W. E. DEBENHAM accounted for the absence of halation on the ground that, the plate being transparent, the light would not be reflected back.

Mr. HENDERSON next showed some alabastine pictures, made in 1859, which appeared exceedingly good. He also showed a positive picture, produced by printing on mica, coated with a mixture of asphaltum and bichromate of potash. He suggested that this would be an easy way of producing pictures for burning in on plaques.

Mr. A. HADDON asked Mr. W. T. Wilkinson if he could inform them how best to extract from the crude bitumen the most sensitive compound.

Mr. WILKINSON replied that he would wash with ether until clearness was obtained, then dry in sunlight, and redissolve in chloroform. In reply to further questions, he said he used the cheapest ether, which contained alcohol. For development he prefered turpentine, using for over-exposure benzole, and, for under, paraffin.

In reply to Mr. PACKHAM, who asked if any benefit arose from the admixture of bichromate of potash with the bitumen,

Mr. HENDERSON could not say if the exposure was made more rapid.

Mr. R. Lockwood and Mr. W. S. Foster were unanimously elected members of the Association.

The Hon. Secretary (Mr. P. Everitt) then read the

REPORT OF THE COMMITTEE FOR THE YEAR ENDING JUNE 30, 1895.

The Committee, in submitting their Annual Report and the balance-sheet, prepared by the Hon. Secretary and Treasurer, congratulate the Association on its improved financial position. Beginning the year with funds in hand amounting to 26*l.* 13*s.* 11½*d.*, we have to report that this balance has increased to 34*l.* 14*s.* 8*d.* The position of the Society thus demonstrates that, with a modest subscription of 5*s.* per annum, weekly meetings may be held, and much useful work done. This year, for the first time in the history of the Association, a programme was arranged and issued. Though the change was regarded with misgivings by some, the result has been satisfactory. The arrangements have been carried out with few exceptions, but these were perhaps unavoidable, considering the length of time in advance some of the dates were fixed. Discussions on the following subjects have been held, and our thanks are due to those gentlemen who kindly undertook to open these debates:—*Some Unrecognised Uses of Single Lenses*, by Mr. J. Traill Taylor; *A Day at Winchester*, with lantern illustrations, by Mr. Claud S. Scott; *Demonstration of the Klic Process of Photogravure*, by Mr. Horace Wilmer; *The Fish Glue Photo-engraving Process*, by Mr. Henri Calmels; *Polarisation of Light; its Bearing on Photography*, with lantern demonstration, by Mr. Birt Acres; *Judging at Photographic Exhibitions* (Elastic Exhibition rules) by Mr. Walter D. Welford; *Stratford-on-Avon*, lantern entertainment, by Mrs. Catherine Weed Ward; *Development and Toning of Bromide Prints*, by Mr. W. Ethelbert Henry, C.E.; *Impressions of Impressionism*, by Mr. T. Bedding; *Fading of Albumenised Prints*, by Mr. A. Haddon; *A Point in Connexion with Plate-coating*, by Mr. R. Child Bayley; *Collodio-chloride Emulsion for Transparencies*, by Mr. J. S. Teape; *Rome*, lantern entertainment, by Mr. S. J. Beckett; *The Hand Camera: Then and Now*, by Mr. Walter D. Welford; *Photo-micrography*, with lantern illustrations, by Mr. T. E. Freshwater; *Some Further Experiments in Colour Photography*, by Mr. E. J. Wall; *Development and Fixing*, by Mr. J. Cadett; *Photography and Cycling*, by Mr. E. H. Bayston; *Photo-mechanical Work in Japan*, by Professor W. K. Burton; *Toning Platinum Prints with Cutechu*, by Mr. J. Packham; *The Spectroscope*, by Mr. A. Haddon; *Panoramic Photography*, by Mr. J. Traill Taylor; *Colour Photography by the Lippmann Process*, by Mr. A. Child Bayley; *Stereoscopic Photography*, by Mr. T. Bedding; *Photographic Outings*, by Mr. C. H. Oakden; *Spirit Photographs: should they command Belief?* by Mr. P. Everitt.

Death has removed from our roll of members the old and valued names of Richard Keene, of Derby, and R. L. Kidd, of Richmond; and, as time is constantly bringing losses to our ranks by its inevitable changes, we trust our members will do their best to induce their friends who are interested in photography to join us.

Through alterations at our former headquarters at the Champion Hotel, we have had to find other rooms at the Raglan Hotel, 61, St. Martin's-le-Grand. We have been fortunate in securing a central position in London, and we trust our members will find the change satisfactory.

Signed on behalf of the Committee of Management,

A. HADDON.

The report and balance-sheet having been adopted, votes of thanks were passed to the retiring officers, and the following were then elected to serve for the ensuing year:—*Trustees:* Messrs. J. B. B. Wellington, and J. Traill Taylor.—*Committee:* Messrs. E. H. Bayston, Thomas Bedding, C. H. Cooke, R. P. Drage; T. E. Freshwater, E. W. Parfitt, J. S. Teape, and E. J. Wall.—*Curator:* Mr. A. Haddon.—*Recorder:* Mr. G. W. Atkins.—*Librarian:* Mr. J. E. Hodd.—*Hon. Secretary and Treasurer:* Mr. P. Everitt.

Mr. A. L. HENDERSON offered to subscribe 5*l.* 5*s.* if the Association would provide an equal amount to be awarded to the author or authors of the best papers read before the Association during the coming year.

Mr. Henderson was heartily thanked for his offer, which is to be discussed in detail at a future meeting.

Gospel Oak Photographic Society.—The members of this Society held their competition outing on June 8 at Kingsbury; the subjects were "Kingsbury Church" and "The Brent." The successful competitors were: First certificate, Mr. J. Gittens; second certificate, Mr. C. G. Borrett; third certificate, Mr. W. A. Palmer. Mr. W. E. Debenham kindly acted as Judge, and gave his decision at the last meeting of the Society, held June 18.

Hackney Photographic Society.—On June 25, Mr. J. Gardner presiding.—The Excursion Secretary gave report of the preceding Saturday's excursion to Burnham and Crouch, and made announcements for future excursions. In the course of the evening Mr. R. BECKETT gave an interesting lecture on *Small Pictures* versus *Large Ones*. He said that it was a mistaken idea that small pictures had not so much chance of success at Exhibitions in comparison with large. Large pictures undoubtedly caught the eye of the general public, but it was a fact that Judges paid as much attention to small work as to large. Indeed, small pictures were more disregarded by workers than by the Judges. Now, as to the obvious advantages of small pictures over large ones, they were many. They were much easier to manage in all respects—in composition, development, and printing. Furthermore, they possessed the advantage of cheapness. Although easier to compose, it must not be thought that this could be done any how. A small picture should be simple in subject and never crowded. Many mistakes were made in endeavouring to get too much on one plate. As to printing, the speaker preferred a smooth-surface paper for small pictures; detail could not be shown on rough paper. The recent and prevailing fashion for "fuzzytypes" had its use in showing the necessity for attending to breadth in composition, but it must not be supposed that breadth and detail could not go together. The contrary was the case. A discussion followed Mr. Beckett's lecture, in which many present took part.

Leytonstone Camera Club.—At the Annual Meeting of this Club, held on Saturday, June 22, at The Studio, High-road, Leytonstone, the officers for the ensuing year were elected as per list. *President:* Dr. W. Pickett Turner.—*Vice-Presidents:* Messrs. E. W. Byrne, Q.C., M.P., W. B. Whittingham, J.P., A. Horsley Hinton, and D. J. Morgan.—*Council:* Messrs. A. E. Battell, G. E. Cox, C. A. Russell, A. P. Wire, F. W. Wates, T. Simonds, J. Proctor, A. Hands, A. Woodcock, and T. F. Sanderson.—*Hon. Lanternist:* Mr. W. E. Hall.—*Hon. Librarian:* Mr. H. P. Hood.—*Hon. Treasurer:* Mr. C. Andrews.—*Hon. Secretary:* Mr. B. Harwood, 110, Windsor-road, Forest Gate, E.—*Assistant Hon. Secretary:* Mr. G. H. Cricks.

North London Photographic Society.—June 18, Mr. A. E. Smith in the chair.—Mr. E. CLIFTON lectured on *Copying*. To begin with, Mr. Clifton advised that, no matter how little copying one did, a board should be fitted up with laths or grooves for sliding the camera on, and a flap hinged at right angles at one end to affix the original to or place it against. This arrangement facilitated focussing, promoted parallelism, and saved "language." The camera should be firm, and preferably one with square bellows. A front extension or an addition by means of separate bellows for long focus was necessary, but a swing back and rising front could be dispensed with. A diaphragm made out of black card placed in the camera was useful to shut out reflected light. A rapid rectilinear lens was best, but whatever lens was used it was most important to see that it was *clean*. A small stop was not desirable, as with it you lost the roundness that was obtained with a stop of about *f*-11. The fact that the increased length of focus reduces the value of the stop should not be forgotten. He preferred a diffused rather than a strong side light. To aid focussing the ground glass should be oiled, and, if the original was very dark, he placed a thin strip of card against it. A box printing frame with plate glass in front was useful for holding silver and other prints that might not be flat, and the grain of the paper did not show so much with the plate glass in front. In copying newspaper and other pictures which had print on the other side of the paper, the print side should be mounted on a dark card or placed against a black velvet or other dark backing. If it was desired to block out any part of the original, it could be painted over with Chinese white, and, if necessary, the coating could be worked on. A damp sponge would remove the coating. If the copy was to be an enlarged one to the extent of eight or ten diameters, it was better to first enlarge to half the size required, then make a print, and further enlarge from that; otherwise, in enlarging to the full size at once, the light was so attenuated that you got a result wanting in pluck. Slow plates were best for the work, orthochromatic for choice, and for subjects other than line work the pyro-soda developer was as good as any. For line work hydroquinone should be used. In developing, the image comes up all at once, not in gradations as in ordinary negative work, and, unless this is remembered, one is apt to conclude that there has been over-exposure. Care should be taken that the fixation is thorough. During the discussion that followed, Mr. HART, referring to orthochromatic plates and screens, stated that, in his opinion, it was insufficient to have screens of only two or three tints. You wanted twenty. He related how, about the year 1862–3, a friend of his, who was most successful in copying pictures, had glasses of various tints which he placed in front of the lens, changing them until he hit upon the one that made the picture appear grey on the screen. He said a useful little dodge to focus in copying was to stretch a piece of the finest white or black cotton across the subject according to its colour, and focus the thread. If a print to be copied is not wanted again, he takes it off the card, dips it into gelatine, and squeegees it on to glass as the best way of getting rid of the grain in the paper. A hearty vote of thanks was passed to Mr. Clifton for his lecture. This was the last meeting of the Society before the vacation. The next will be held on the first Tuesday in September.

Putney Photographic Society.—On Saturday, June 22, members of the Society met at Ealing, and under the leadership of Mr. W. R. Stretton walked to Harrow-on-the-Hill, by way of Perivale, Greenford-road (crossing the Brent and canal), and across the fields. During the early part of the walk, the party came across various haymaking operations which were in full swing, and on which a good number of plates were exposed. A group was successfully taken by Mr. W. Martin, jun., who was enabled to take his place in the group by means of two pieces of black cotton tied to the cap and focussing cloth respectively, and held one in each hand.

ON Saturday, June 29, some of the members had a ramble in Richmond Park. There was somewhat too much wind to permit time exposures being given on the fine studies of old oak-trees so numerous in this park, but several snap-shots were taken at the large number of deer, great caution having to be exercised before obtaining satisfactory grouping.

Photographic Society of Japan.—The Annual Meeting of the above-mentioned Society was held at the Koyokwan, Shiba, Tokyo, on Friday, May 17, at four p.m., Mr. C. D. West, M.A. (Vice-President of the Society), in the chair. There was a good exhibition of photographs by members of the Society, particularly notable being those from the Genrokukwan, and from Mr. Otis A. Poole. There was also a technical exhibition, in which the following items were noticeable:—By Mr. T. Asanuma, a bromide lamp, an adjustable finder making it possible to fix any lens to the camera by the mere turning of a milled ring, Ross's concentric lenses, a very neat hand camera by the Rochester Optical Company, and other things; by Mr. R. Konishi, a number of prints of different sizes, some very large, showing the performance of different modern lenses, by Messrs. Dallmeyer & Co. and other opticians; an exhibit by Messrs. Favre-Brandt, of which more particular mention is made further on. On account of the large amount of business to be got through, the minutes of the last meeting were taken as read, after which the following gentlemen were unanimously elected members of the Society: Mr. Edwin Dun, Minister of the United States of America, Mr. Y. Egi, Mr. Walter Elkan, and Mr. C. Oyama. The officers for the past year having resigned, it was duly proposed and seconded that they be all re-elected, and the proposal was carried unanimously. It was duly proposed and seconded, and carried unanimously, that Mr. Edwin Dun, Minister of the United States of America, and the Hon. P. Le Poer Trench, be elected Vice-Presidents of the Society. The Secretaries' report was then read as follows:—Your Secretaries have to report that the affairs of the Society during the past year have proceeded harmoniously and prosperously. Our membership has been largely increased. There have been regular monthly meetings with a fair amount of attendance. Accounts have been given of various new instruments and processes. In a few cases an entire process has been demonstrated before the Society, and work by different members has been almost constantly on view. Lantern exhibitions have continued to be one of the most attractive features. One lantern meeting was held in Yokohama. Especial thanks are due to the Messrs. Kajima for hospitalities extended in their new photographic studio and for exhibition of lantern pictures at the same place. It was arranged for four field days during the year. The two at Enoshima and Kodzu were highly successful, the third was indefinitely postponed on account of bad weather, and on the fourth occasion, in Kamakura, owing probably to some misunderstanding, only three members were present. It becomes more and more evident that the Society is

in need of permanent quarters of its own. In our present prosperous condition it would not be difficult to procure a good-sized room for meetings and lantern shows, with perhaps a smaller room adjoining and a dark room for the use of members. Such a home for the Society would serve not only for a general meeting place for consultation, &c., but also as a depository for our numerous presents, and for preserving examples of the best work of different members. Should such a place be provided, the gradual accumulation of a photographic library would be sure to follow. The proceedings ended with a vote of thanks to the Chairman. After the meeting there was a dinner in Japanese style, which was enjoyed by the large number of members who attended, and was enlivened by the performance of the orchestra of Mr. Kajima Seibei, both Japanese and foreign music being played.

FORTHCOMING EXHIBITION.

1895.
July 6 ..... *Agricultural Hall. W. D. Welford, 59 and 60, Chancery-lane, W.C.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

DISUSED ROLLABLE FILM CAMERAS.

To the EDITOR.

SIR,—On reading your comment in your issue of June 21, regarding our advertisement, which appeared in your advertising pages of June 14, we can but conclude that the same must have been hastily written.

The wording of the advertisement does not reflect on the merits of any camera, and can only be considered as indirectly doing so by the typographical prominence given to the unfortunate words. In all our advertisements we aim to make prominent the fact that our films can be used in other roll-holder cameras than our own, and we instanced one such by name as being the most largely used. It must be well known to you that a very large number of exclusively roll film cameras have been disused owing to a supposition that there was but one make of film which could be used in them. This would, doubtless, apply to our own cameras as well, were they not constructed with the particular view of admitting any roll film to be used in them if users became dissatisfied with our film.

Admitting belief in your expressed desire for fairness, it seems unfortunate that your columns should have been used (doubtless innocently) to publish in June, 1894, full details of the decision given in the United States Court of the suit of the Eastman Kodak Company against the Blair Camera Company, both American, when the only effect on the minds of the majority of readers was that this decision applied as well to us.

Trusting you will give the same prominence to this letter that you have to your comments,—We are, yours, &c.,

EUROPEAN BLAIR CAMERA CO., LTD., T. H. BLAIR, *Director*.

June 26, 1895.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

To the EDITOR.

SIR,—Will you kindly allow me to state that the official programme of the Shrewsbury meeting has been forwarded to the secretaries of all the Photographic societies in the United Kingdom, as well as to many societies on the Continent and in America, and that it differs slightly from the early proofs which you have kindly published. The whole of the arrangements reflect great credit upon the local committees Exhibitors are kindly requested to have all their goods at Shrewsbury by Thursday the 11th, so as to ensure everything being ready by the opening day of Convention, July 15.—I am, yours, &c., R. P. DRAGE, *Hon. Secretary*.

95 *Blenheim-crescent, London, W., July* 1, 1895.

THE COURTESY OF "COSMOS."

To the EDITOR.

SIR,—We have hardly got over our surprise at "the chemistry of 'Cosmos'" before he looms large with his courtesy. For an example of which I refer your readers to the current week's number of your JOURNAL, wherein "Cosmos" exhibits his peculiar politeness of manner in criticising my paper, *A Promising Printing Process*.

Those who know me will simply jeer at such mud-stained insinuations as my being "animated throughout by a fervent and apparently *not disinterested* desire to exalt collodio-chloride," or of accusations of "obvious prejudice," and "more than mere personal preference." As a fact, I have not a ha'p'orth of pecuniary interest either way.

As to "reckless rodomontade," I suppose that is what people with a normal amount of alkalinity—that is, with less acidity—might call terse and graphic language. There is, besides rodomontade, such a thing as reckless sophistry; as, for instance, where "Cosmos" states that collodion paper can be tortured to imitate the defects of gelatine paper, or that he can produce ten-year-old gelatine prints which have not changed, and more of this same feeble character.

It is, of course, common knowledge that gelatine paper does not *always* exhibit all, or any, of the faults I drew attention to; none the less, each separate print is liable, under ordinary working conditions, to develop one or more of the defects spoken of by me, most serious of all being the rapid change which may take place in the finished print.

"Cosmos" asks whether I am content to use gelatine plates. Surely he is aware that the two cases are not on all fours. Any how, I will reply that I am by no means satisfied with the gelatine plates, but look forward to the time when a greatly improved substitute shall be available.

The preliminary to improvement is discontentment. Therefore, he who, like "Cosmos," advocates that one should do nothing but prate of photographic perfection, is helping to retard photographic knowledge. I am quite content to let "Cosmos" crack gelatine paper against my favouring of collodion paper. As soon as a make of the latter is available which does not curl, nor flake, nor cost more than gelatine paper, it will, I firmly believe, hold the field for most ordinary professional and commercial work.—I am, yours, &c., HECTOR MACLEAN.

June 28, 1895.

To the EDITOR.

SIR,—In the strange attack made by "Cosmos" on Mr. Hector Maclean in your columns of June 28, there are two sentences which so immediately concern us that we cannot allow them to pass without challenge, it being borne in mind that the paper described and advocated by Mr. Maclean is Paget matt collodio-chloride.

"Cosmos" says that Mr. Maclean "was animated throughout by a fervent and *apparently not disinterested* desire to exalt collodio-chloride printing paper at the expense of gelatino-chloride;" and, again, "it suggests the existence of something more than a mere personal preference." If these sentences mean anything at all, they imply either that Mr. Maclean is financially interested in our business, or that he was bribed by us to advertise our goods. Permit us to say that neither supposition has the slighest foundation in fact; we have not the pleasure of Mr. Maclean's acquaintance, have never met or seen him, and the only communication we have had with him was a letter he wrote to us a few days before the meeting, informing us he was about to demonstrate the working of our paper to his Society, and asking if we would like to avail ourselves of the opportunity to send any one from our works to assist, or if we had anything new to communicate. We preferred, however, to leave the matter entirely in his hands, and, when writing to him to this effect, sent a small quantity of paper and platinum toning bath for use at the demonstration. Possibly this munificent present constitutes the bribe alluded to by "Cosmos." If he thinks it is sufficient, we are open to deal with him on the same terms.—I am, yours, &c.,

Watford, July 1, 1895. PAGET PRIZE PLATE CO.

PHOTOGRAPHY IN ROUMANIA.

To the EDITOR.

SIR,—In reply to C. Hobhouse regarding "Photography in Roumania," I may state that the commercial aspect is a good one, as the professional photographer is not handicapped by the amateur, as there are none who meddle and intrude in that calling. The standard work is of high class, as our people are very sensible to good work. I envy the man who can go to that country and start in photography with the necessary £. *s. d.* in hand.—I am, yours, &c., E. KRAUSS.

2, *Werter-road, Putney*.

THE PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—I wrote you some seven months ago and asked your opinion on joining the Copyright Union. You advised me to join it. I regret very much doing so; they trifled with my case and played with it until the firm collapsed, and I had nothing; had I put it in the hands of a local solicitor here, no doubt I should have obtained substantial recompense. Such people never had I to deal with before, and I sincerely trust, should any one ask your advice regarding them, you will not try and persuade them to join.—I am, yours, &c., JAMES LEACH.

Carnarvon, June 26, 1895.

Exchange Column.

Will exchange Voigtlander view lens, 12×10, for retouching desk or *carte-de-visite* lens.—Address, H. HALL, 21, Fitzroy-street, Cambridge.

Will exchange twelve-inch bar burnisher, the L'Emailleur, in good condition; wanted, safety bicycle, or half-plate hand camera, in good condition.—Address, W. J. REED, Arcade Studio, Bournemouth.

Wanted, whole-plate camera, complete, in exchange for half-plate Lancaster's instantograph and powerful pair of field glasses.—Address, A. SILVESTER, care of H. Roland White, Moseley-road, Birmingham.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Joseph Smith, Stroud.—*Photograph of Cat and Dog, entitled "Playmates."*

William Arthur Skill, Lincoln.—*One photograph of Lincoln at sunset,* 1895; *two photographs of sunset over the city, Lincoln.*

INTERESTED.—By the suppression of your name and address, your letter loses all the value it otherwise might possess.

CANTAB.—The latest paper on the subject was published in one of the May numbers of *Light* (Duke-street, Adelphi, W.C.), which see.

W. FAWCETT.—Messrs. Mawson & Swan, Soho-square; The Britannia Works Company, Ilford, and other firms supply plates suitable for process work.

ALECSON.—The plaster cast shows that you have got hold of a process that may be made valuable, especially as no heat is employed. The relief is even more than sufficient.

W. FORD.—From the description, we surmise the piece of apparatus is an iodising and bromising box. If so, its only use is in the Daguerreotype process for sensitising the silver plate.

C. W. A. (Leeds).—The remedy would be worse than the disease, as it might irretrievably spoil the lens. It had better be sent to a maker of photographic lenses—the maker of the one in question, if possible—to be repaired.

H. L. JEFFRIES.—The test negative (print from which is enclosed) is fitted to the Burton actinometer. We are under the impression that the negative is only supplied with the instrument in its complete form.

C. B. CLARE.—Suitable proportions for a studio, for professional purposes, are from twenty-five feet and upwards by eleven to fifteen feet wide. If the space is available, we should recommend a studio thirty feet long by fifteen broad.

T. H. G.—The greater number of the reproductions of paintings that are made on the Continent are done by the wet collodion process. Foreign workers consider that better results, for their purpose, are obtained with collodion than with gelatine.

W. F.—If the only hands you employ are an operator and a young lady in the reception-room at the branch establishment, that will not come within the factory law. The inspector of factories for your district will give all the information you require.

VERAX.—The advantage of a lens having an aperture represented by *f*-5·6 over one of *f*-8 is that it requires but half the exposure. Many hand cameras are, however, fitted with lenses of *f*-8, and some of the cheaper forms with those with a still smaller aperture.

B. MORRIS.—The albumen process for transparencies, so far as the printing is concerned, can be worked by gaslight. Of course, the exposure will be very much longer than would be required with a gelatine plate. You are quite right in the details. The plates need not be backed.

DURHAM.—There is no occasion whatever to use a fresh solution of bichromate of potash each time that tissue has to be sensitised. The same solution may be used time after time, or until it has become of quite a dark colour. Some even prefer a solution that has been in use for some time to a quite new one for some kinds of work.

COUCH.—We think you will not be very successful if you substitute a gelatine print for a carbon one; but there is no reason why you should not put the thing to the test—a thing we have not done. A copal varnish, for stoving, is supplied by most of the large varnish-manufacturers. The other materials can be had at most good oil shops.

MAURICE STEPHENS.—The distance mentioned (three miles) is too great to permit of an object there situated to be made sharp, to the exclusion of this property in all nearer or more distant objects. It might be possible to have a lens constructed to do this approximately, but it would have to be large and of a long focus, and would be a most costly instrument.

E. N. O. (Lincoln).—There is nothing wrong; it is just what usually takes place. The silver bath for sensitising albumen paper becomes discoloured by use. All that has to be done is to add a little kaolin after it is returned to the bottle, and shake up violently for a minute or two. The next morning the solution will be found decolourised, and, after filtering, ready for use again. The operation may be repeated as often as circumstances require.

D. WILSON.—It is not at all necessary that the photograph should bear the word "Copyright." The Copyright Act does not require it. The pirating of a print that is not marked copyright renders the one doing so liable to the same penalties as if the print were so marked. Any one copying a photograph does so at his own risk. The photograph being brought by a customer does not exonerate the photographer from liability. The only way to ascertain if the copyright has been registered is by searching the register which is kept at Stationers' Hall.

BEACON says: "I shall be glad if you will kindly give me your valuable advice as to the best way to mend a painting that has a hole torn in it through falling down. The painting is on a stretcher, and the damaged part is about two inches long on the dress of the persons."—We should advise that the painting be sent to an experienced picture restorer. It requires some skill to effectually hide a tear in a painting. Amateur attempts at the work generally end in making the damage more conspicuous than it would be if left alone.

WAL writes: "Mounting enamelled prints.—I experience great difficulty in mounting 10×8 enamelled prints; they will persist in cockling. I use gelatine round the edges, put on about a quarter of an inch wide, then press down; but when they have been on about five minutes they buckle up in the middle and look very bad, and, of course, I cannot use starch paste as they are glazed, neither do I want to back them. I have a lot to do now, and will you give me a hint how to do them so that they will be quite tight and flat?"—The best way is to back the prints with paper, then they can be mounted without difficulty. We do not think that the size prints mentioned will be easily mounted so that they keep flat without they are backed, unless, indeed, they are on unusually thick paper.

L. P. H. asks: "Can you please tell me the cause of the black specks on enclosed print, or suggest any means to prevent them? They occur more or less on every print in a batch of about thirty-six 10×8 and whole-plates. They showed in the washing water before toning as yellowish-black spots. In toning both became black. Separate toning, sulphocyanide baths used. All dishes kept perfectly clean, and manipulations conducted carefully. Prints washed before toning in tin dish coated with Brunswick black. A few spots occur almost every toning, but never so badly as in the last. Would a paraffin oil stove used for heating water in the room where printing is done have any bad effect?"—It is not at all likely that the paraffin stove is the cause of the spots. They are most probably caused by the tin dish in which the prints are washed prior to toning. Metal dishes should be avoided in silver printing.

NOBRAC writes: "You will greatly oblige by informing me (in your correspondents' column) of the cause and prevention of the following, viz.:—I am engaged on double-transfer carbon prints, and am using matt-surfaced opals as temporary supports. In drying the prints (on the temporary support), I find they peel or strip off the opal when dry or nearly so, although dried by natural heat, in a very cool room, where water is freely used (both hot and cold). I have tried dipping the prints continually in water while drying, so as to dry them as slowly as possible, but find it of no avail. Perhaps the very hot and dry weather is the cause; and, if you could inform me of a preventive, I should be very glad. I use collodion (specially prepared) and powdered talc as transferring mediums. Thanking you in anticipation."—This is a very common trouble in working the carbon process, as described by our correspondent. The only thing we can suggest is to use a thin collodion and be careful to clean the talc off as closely as possible.

M. FIELD writes: "I am desirous of projecting on to a screen pictures measuring 1×¾ inches, so that I shall see them the size of 18 to 24 inches, not larger. I do not want the result brought about by the usual lantern, for I must use the machinery I now have in my cabinets, and will try and resolve my letter into questions. 1. Taking a standard light, will a small condenser give more light than a large one? 2. What size condenser is necessary for enlarging from pictures 1×¾ inches to 18 inches? 3. Will an incandescent light make a good result on the screen; and, if so, what candle-power lamp, presuming the transparency to be good? 4. What sort of lens would be required? 5. What distance the condenser from the light, and what distance the condenser from the lens? 6. Where are these things to be purchased?"—In reply: 1 and 2. If the small condenser transmits the same angle of light as one of large dimensions, it will be preferable for your purpose, as the lenses will be thinner and stop less light than those of large diameter. One of about three inches' diameter, and of the usual compound form, will prove sufficient for illuminating your subject, even when the slide is placed a small distance in front of it. 3. An incandescent electric light of fifty or sixty candle power ought to answer so far as illuminating power is concerned, but the ordinary burners give a light that is too large to permit of the greatest sharpness being obtained, for the smaller the flame the better will be the definition. If an electric lamp must be used, a small arc will be preferable to a large incandescent. It is probable that a lime-light would be found most convenient on the whole. Possibly an Argand petroleum will serve your purpose if the top and bottom of the flame is stopped by a brass plate, with a perforation not exceeding a sixpence in size. 4. A small portrait lens of *about* four inches' equivalent focus. 5. The light must be at such a distance from the condenser as to bring the apex of the converging cone of light in proximity to the front lens of the objective, and this objective must be rather more than its solar focal distance from the object to be projected. All this can be accurately determined by a single trial. The optics involved are precisely similar to those of the usual optical lantern. 6. These things can be procured from or through any respectable dealer in photographic and lantern requisites.

CONTENTS.

	Page
PHOTOGRAPHING THE HEAVENLY BODIES BY AN ORDINARY CAMERA	417
PRISMS AND MIRRORS FOR REVERSED NEGATIVES	418
A CONTINUOUS TONING BATH FOR GELATINE PAPERS	419
ON THINGS IN GENERAL. By FREE LANCE	421
PINHOLE PHOTOGRAPHY. By Y. ISAWA	421
THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION	423
SUMMER PHOTOGRAPHIC EXHIBITION AT THE AGRICULTURAL HALL	424
MOVING OBJECTS AND PICTORIAL PHOTOGRAPHY. By HENRY W. BENNETT	425
SEASONABLE NOVELTIES	426
OUR EDITORIAL TABLE	426
NEWS AND NOTES	427
RECENT PATENTS	428
MEETINGS OF SOCIETIES	429
FORTHCOMING EXHIBITION	1
CORRESPONDENCE	1
EXCHANGE COLUMN	
ANSWERS TO CORRESPONDENTS	

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1836. Vol. XLII.—JULY 12, 1895.

A NOTE ON LIGHTING.

In no department of photography is there so much scope for the display of skill and taste as there is in the lighting of the sitter. To get the graceful pose, and, above all, the fine light and shade on the face which brings out the features in perfect modelling, demands the highest artistic skill on the part of the operator. It is here where art comes in, in contradistinction to science, by which a negative showing all these æsthetic points is obtained. A perfect portrait is a product of both art and science.

Among portrait photographs which are occasionally sent us to illustrate some technical defect, such as spots, uneven toning, and discolouration, are some which, in respect of lighting and posing, are very far removed from being good; there are to be found in them cross-lighting, shadows cast in more directions than one, false light and false reflection from the eyes, strong, harsh high lights and shadows devoid of detail, patchiness abounding, and everything present that can offend the cultured eye. We have no inclination and do not mean to give any correspondent away, only we think that the greatest number of the faults just enumerated, together with some others, were to be seen in the specimens sent by one on whose card he described himself as a photographic "artist."

It is scarcely the best advice, but we really must inform budding artists of this type that they should take a rudimentary lesson of a somewhat abject nature, thus: Procure one or two copies of the sixpenny illustrated weeklies, such as the *Graphic* or the *Illustrated London News*, and, having made a selection of one of the best portraits, which will have been legitimately engraved, not "processed," study it carefully, and see in what respects it differs from your own work. Imitate the pose, and, above all, the lighting, as closely as possible, and practise upon some patient friend, with the engraving as a mentor, until a species of disgust with your former work is experienced. In reply to what some might say about this being slavish imitation, which tends to prevent the aspirant from cultivating and exercising originality, we are very well aware of this, and are treating the said aspirant as if he were a boy at school, learning to write from a printed copy line, or like a youth learning the violin or other instrument of one competent to guide by example.

The next question is, How can one so fit up his studio as to ensure obtaining proper lighting of his sitter? We answer this by giving a description, suggestive, if not accurate in every detail, of one we many years ago saw fitted up from suggestions received from the late Jabez Hughes, of Ryde, and James G. Tunny, of Edinburgh, both past masters in the art of lighting of the sitter.

The studio, which was ridge-roofed, had two sets of spring roller blinds on each side, one set attached to the eaves and moving upwards to the ridge, another set affixed to the ridge and moving downwards to the eaves. These blinds were about five feet in width, and, as each was controlled by a cord, it will be perceived that as much or as little light as was desired could be admitted, and this from any portion of the sky above, or at one side or both of the sitter.

This method of controlling the light is, we think, more extensively employed in America than in our own country, and may it not account for the undoubtedly fine modelling seen in the works of the higher class of professional photographers in the United States, where the greatest attention is bestowed upon the lighting of the sitter?

We have seen many studios in the United Kingdom in which a similar effect is obtainable by blinds which slide on strings or wires by means of rings or hooks, and, although good effects of lighting are frequently obtained, it always appeared to us to be a rather clumsy and inelegant means to push the blinds backwards and forwards by means of a long rod, contrasted with the drawing up and down the roof blinds by the strings of the roller shades.

In speaking of model portraits for study, we have specially advocated those that have been engraved rather then those printed from process blocks. Our reason for this, and we are sorry to have to give it, is that the engravings are so much better and more artistic than when produced from process blocks. Every line has been the subject of study by the engraver, and the printing is more efficiently performed, whereas in too many of the processed works smudginess prevails.

We write this notwithstanding that H. P. Robinson (than whom we know of no one more competent to speak with authority on this subject) says that "there is a pernicious custom amongst some inferior photographers of collecting together a set of poses, and fitting their sitters to them, or allowing their customers to select their own, no matter how incongruous the thing may be. Photographers should learn the principles of their art, and then invent poses for themselves." This is all quite true, but it is not the same for which we are putting in a plea, which is to use such guides for self-education purposes much in the same way as one would

use, say, Birket Foster's *Aids to Drawing*, by copying them slavishly until one was able to do it one's self, and, having grasped the principles involved, step from the region of imitation into that of originality. This, and nothing more, is what we aim at in recommending a slavish study, and even imitation, of works which, as regards lighting and posing, are worthy of being imitated.

While on this topic, and in the interests of art, we would urge the careful study of good literature on the subject, such as Robinson's *Pictorial Effect*, and his *The Studio*; Duchochois' *The Lighting in Photographic Studios*, and, if it is possible to procure it, which we doubt, Bigelow's *Artistic Photography*.

AMMONIA AND ITS CARBONATES.

Some little time ago we published an account of an examination of various samples of commercial ammonia solution, showing how a chemical of such widespread employment as this, even when purchased from old-established makers and dealers, was liable to the gravest fluctuations in strength, although the contents of newly opened bottles were the subjects of the comparative tests. There was, of course, nothing new in the fact that ammonia solution was not always to be relied upon, but this want of trustworthiness had usually been attributed to the inevitable loss through the repeated opening of the stone bottles, a cause that was inoperative in the case we allude to. Because of this uncertainty of strength, apart from other reasons, it has often been suggested that it would be advantageous to use a salt of ammonia—the "carbonate of ammonia" of the shops.

It is worth while devoting some little attention to the consideration of what this ammonia carbonate really is. The source is well known; the great bulk of the ammonia carbonate —also known as sal volatile, rock ammonia, and so on—is the ammonia liquor of the gasworks. The sulphate of ammonia obtained from this source is distilled with chalk, and the carbonate is collected in the solid form in receivers. There is, however, another kind to be met with, technically known as "volcanic ammonia;" but as it is three or four times as dear in price as the other, and, as far as we can ascertain, superior in no respect except in its freedom from empyreumatic taint, it need not be here further discussed, especially at a time when the photographer seeks rather to diminish than increase his outlay on chemicals. The crude salt obtained from gasworks' ammonia is further purified by resublimation at a low temperature, and this is the product usually obtained when the dealer is asked for "carbonate of ammonia."

If now we turn to authorities to know exactly what this substance is, for some purists term it "ammonia sesquicarbonate," though the simple carbonate is its more usual name, we are quickly struck with a remarkable fact. Here is a substance of wide-spread use, commercial importance, and chemical value, yet we never get a positive statement about it. We refer to the article "ammonia-carbonate" in the last edition of *Watts' Dictionary of Chemistry*, and find, "Three definite salts seem to exist, the normal, the acid, and the sesquicarbonate. The last is sometimes regarded as a compound of the first and the second." This is unsatisfying enough; but the uncertainty is emphasised later in the article by the statement, "Another carbonate appears to exist in the mother-liquor from the preparation of the sesquicarbonate." "Seems," and "appear" do not permit positive assertions to be made from them. Attfield's is a very popular and valuable work on chemistry, treating particularly of commercial products. If we refer to its pages, we are again met with a statement no more exact than "This salt . . . . is probably a mixture of one molecule of an acid carbonate of ammonium, and one of a salt named carbamate of ammonium." If we finally refer to the older edition of Watts', we find Rose quoted as admitting "the existence of a considerable number of carbonates of ammonia, to which he assigns very various and complicated formulæ;" but, to counteract this, H. Deville's opinion is given as being that "there exist only two carbonates of ammonium of definite composition."

We may now conveniently see what the properties of this supposed substitute for ammonia solution are. If the commercial salt be treated with a large quantity of water, it is entirely dissolved; but, if a small proportion only be used, the acid carbonate is undissolved, and the water takes up a salt generally understood to be carbamate. Alcohol also dissolves the latter, and leaves the acid carbonate behind. The solution of carbamate in water quickly decomposes, and becomes converted into neutral carbonate. The acid carbonate in solution —strong or weak—according to Gmelin, "gradually becomes ammoniacal." The solution of the commercial salt is used in medicine; the authorities, possibly through being aware of the variation its characters are subject to, order, when the salt is dissolved, the solution to be made by adding a quantity of ammonia solution.

An examination of the properties of the solid salt itself does not present to us any very desirable properties. It requires to be kept very closely from the air, or it becomes gradually converted into the acid carbonate. It can, however, be satisfactorily kept in well-stoppered bottles. When so kept, it is a good plan to grease the stoppers with vaseline, which, besides further protecting it from the air, prevents the stopper becoming tightly fixed, as will often happen if this precaution be not taken. When the carbonate has become changed in this manner, it is easily seen by the opaque appearance it presents. This alteration may be only a surface change, and, if the white covering of greater or less depth be scraped off, the unchanged salt will be found beneath the crust of white.

We think we have now written enough to conclusively show that there is little to gain and everything to lose, as far as regards certainty of composition is concerned, by exchanging simple ammonia solution for a carbonate, be the latter normal, neutral, or acid.

WASHING GELATINE FILMS IN HOT WEATHER.

Ignoring, for the moment, the use of formalin (see issue of April 19) as an infallible means of enabling both plates and paper to be thoroughly washed in a few minutes irrespective of the temperature of the weather, and pending its general employment, we may remark that, although modern improvements in the manipulation of the gelatine itself, as well as in the preparation of the films, have vastly decreased the difficulties attending their manipulation, still the abnormally high temperature that has been with us during the past few weeks must have proved more than usually trying wherever gelatine plates or paper are in every-day use. This is equally true whether the operations be on a large or small scale, for, despite the most carefully devised precautionary system, the very fact of large numbers being handled renders it increasingly difficult to give individual attention to each plate or film; and, though

the small operator may stand at some little advantage on that score, the absence or neglect of any system in his case too often places him in even a worse position.

In the course of recent articles on toning we have referred to the systematic use of soft water, which, as all who are familiar with the working of gelatine are aware, has a proportionately greater softening action on that substance than ordinary spring or tap water possessing a certain degree of hardness. As may be imagined, therefore, we have had a full opportunity of observing the vagaries of films, more especially on paper, under somewhat abnormal conditions of temperature. In spite of this, however, we have had little, if any, more trouble than under ordinary circumstances, for, acting on the principle that "to be forewarned is to be forearmed," we adopted such necessary precautions as to obviate any otherwise likely difficulty.

The greater softening action of soft water is, no doubt, due to the almost entire absence of the sulphates and other salts contained, in small proportion it is true, in ordinary waters, these salts possessing, as is well known, a marked influence in the contrary direction, as witness the use of alum as well as the sulphates of magnesium, soda, and potash, all of which have been more or less employed for the prevention of "frilling" in gelatine negatives, when that trouble was greater than it is now, and some of which are still employed for hardening the surface of gelatine prints, either before or after toning and fixing; but, although the use of these substances is so obviously indicated as the simplest solution of any hot-weather difficulties, there are other conditions that must be taken into consideration in order to derive the fullest benefit with the least danger of introducing other complications.

For instance, take the case of ordinary alum so commonly employed in connexion both with negatives and prints. Although this is a most efficient—almost perfect—hardening agent, as such its reactions with hyposulphite of soda absolutely prevent its indiscriminate use, and necessitate a certain amount of care in the shape of extra washing between the various operations in order to ensure that no secondary reactions are set up to jeopardise the permanence of the negative or positive image. This extra washing may or may not intensify the difficulties according to whether the application of the alum is made before or after fixing; and here the treatment of negatives and prints respectively differs in an appreciable manner.

So far as negatives are concerned, the trouble at the present time is really infinitesimal, as most plates of recognised standing in the market are practically free from any tendency to anything in the shape of frilling as formerly known, though, under such conditions as have prevailed for some weeks past, softening and slight blistering of the film are not uncommon occurrences. These, however, are met with the greatest ease, for the circumstances surrounding the production of the negative entirely favour the use of alum. Thus, directly the development is complete, whether there be any symptoms of softening of the film or not, the use of alum is directly beneficial in other ways, since it immediately arrests all further action of the developing solution remaining in the film, and, further, clears the shadows of the negative and removes any slight stain that may have been produced. Simultaneously with these functions the hardening of the film is effected, and the plate is brought into a condition to bear any necessary amount of washing to remove the surplus alum, with the final result that the negative is probably in a far better condition for immersion in the fixing bath than if it were fixed immediately after development.

But further than this, the hardening action, having once been performed, is more effective in resisting the well-known softening action of the fixing bath than in counteracting it by subsequent application; in fact, it is a case of prevention rather than of cure, and the negative film, neither in the hypo bath nor during the subsequent washing, exhibits that soft and "soapy" character that renders it so liable to injury from the slightest cause. The use of alum at all times, then, with negatives is decidedly advantageous, provided always that the plates are well washed after its use.

We may here digress for a moment in order to point out a fallacy that still exists in many quarters with regard to the amount of washing a negative requires after fixing. Many operators of experience and generally well informed are in the habit of leaving their negatives to soak for some hours, in order to remove the last traces of hypo. This is not only altogether unnecessary, but at the present season is likely to prove more or less injurious, if not absolutely fatal, to the negative, at least in its most perfect condition, notwithstanding that it may have been alumed. Under existing conditions of temperature, decomposition of the gelatine is set up very rapidly, and it is no unusual thing to find a "soft" film entirely slip off the plate after an immersion of an hour or two in tepid water, while, even under the most favourable circumstances, the application of a magnifier will often reveal the fact that the film has been honeycombed with a fine grain from partial solution or decomposition of the gelatine.

If, when it comes from the fixing bath, the negative be well washed under the tap for half a minute, placed to soak in an upright position for five minutes, or, better still, in an inclined position, face downwards, and finally treated to another vigorous washing under the tap or from a jug, it will be practically free from all danger, provided, of course, that the fixing has been perfectly performed to start with. Thorough fixing is a far more important element in securing permanency than prolonged washing afterwards, for which reason we repeat the advice often given before, to systematically pass the negative through a second and clean bath after it is apparently fixed in the first.

Any doubt as to the permanency of a rapidly washed negative can be removed by the adoption of a practice we have followed for many years past in the case of negatives of special value, namely, after drying, to reimmerse them in clean water for a few minutes, and again rinse under the tap. This treatment will remove the last lingering traces of hypo should such remain, and place the film beyond suspicion.

Turning to gelatine prints, the use of alum is not so conveniently made. It is true it is recommended in some of the "instructions" to apply it to the prints previous to toning, in which case, of course, all its advantages as a hardening agent will accrue in the same manner as with negatives; but we cordially agree with other practical workers in condemning this practice as fatal to uniformity as well as to quality of tone. It is quite possible that, given a very thorough washing after the use of the alum, all traces of unevenness may be got rid of, but this very perfect individual treatment is just what cannot be guaranteed in every-day practice, and, in any case, the degradation of tone remains. Where, at this season, the sulphocyanide toning bath is used, it is almost imperative to adopt some means previous to toning, and, if this should take the form of a preliminary bath, we strongly recommend the substitution of sulphate of soda—the Glauber's salt of the chemist—for alum, as being almost as efficient in

hardening the gelatine and less injurious in its subsequent action.

A preferable course to adopt where the natural softness of the film itself, or the specially active nature of the toning bath, renders it desirable to adopt precautionary measures at the outset, is to artificially cool the water as well as the vessels used. In London, or large towns where ice is cheap, this is easily done at a small cost, and where ice is not available a very little trouble, and no cost, will effect the same purpose. Let a gallon or two of water, or sufficient for the preliminary washing of the prints, be set out in the sun in a zinc or earthenware vessel swathed in damp towels or old sacks kept damp by pouring water on them at intervals; the evaporation set up will, in the course of half an hour, reduce the temperature of the contents of the vessel to considerably below the ordinary average, indeed it is not difficult to obtain a temperature as low as 40° Fahr. in this manner.

Gas Cylinders.—Whatever effect the report of the committee appointed to inquire into the question of gas cylinders, when made, may have in restoring or otherwise confidence to the users of them, it is quite certain that the action of the railway companies during the last few weeks in placarding their stations with notices, some printed in red letters, will not tend to inspire confidence in the general public. At one suburban station we saw two of these notices, in red letters, on each platform, stating that the cylinders would only be carried under certain irksome conditions, and not at all as personal luggage. The Metropolitan Railway give notice that they will not convey the cylinders at all, neither will they allow them to be deposited in their cloak-rooms. With this sort of thing the public will be taught to look upon a gas bottle at a lantern entertainment very much in the light of a charged bombshell.

Another New Lens.—Since the issue of the Jena glasses, of new photographic lenses there have been plenty. Until this new glass was introduced, the photographic lenses, the triplet excepted, in general use were composed of four glasses only. Since then the number has been steadily increasing, except in the new English form, that of Mr. Denis Taylor. First, there is the anastigmat of Zeiss, with five glasses. Then followed the double anastigmat of Goerz, the Collinear of Voigtlander, and the new lens of Steinhiel, each with six glasses. Next we have the last new lens of Zeiss, with eight glasses. Now America has "gone two better" with a lens composed of no less than ten glasses. The specification for it has just been published. It is of the doublet form, and symmetrical. Each element is composed of five lenses cemented together, of flint and crown glass. Two of them are collecting lenses, and three are dispersive. It is mentioned in the specification that this lens is free from chromatic and spherical aberrations, as well as from astigmatism.

The General Election and Photographers.—A change of Government, as a rule, brings grist to the photographer's mill, particularly to those who happen to possess negatives of the incoming ministers. We understand that, during the last week or two, there has been quite a run on the portraits of Unionist statesmen; indeed, in some cases, the demand is said to have exceeded the supply. In all recent general elections photography has figured largely in the form of portraits of the different candidates. Process work is, just now, being well pressed into service for the purpose, though not, in all cases, to the credit of photography or to the advantage of the candidates themselves. Although the blocks employed may be good, the results from them are frequently completely spoilt by unskilful printing and bad paper. Cheapness, or, rather, low price, should not be the chief consideration with a would-be member of Parliament. He, of course, desires to be represented to his constituency at his best, but many prints from ill-printed process blocks show him at just the reverse; indeed, in some instances, they are little better than blotches or smudges, representing the original as being more of the "villain" type than a desirable M.P. Portraits for electioneering purposes should be good photographs, or they should not be used at all. By the way, here is a hint to photographers, particularly those in the provinces. Just now there will no difficulty in getting sittings from the local candidates, which at other times would not be accorded. A sitting at these times is generally followed by a more or less substantial order; but this is "shoppy," though perhaps even that is a little excusable in these times of depression.

Photography as an Employment.—A couple of weeks or so back an unfortunate photographer committed suicide, with the usual agent, cyanide of potassium, and left a pathetic letter behind, enjoining parents not to put their sons to photography as a means of livelihood. We imagine that few photographers need that advice. Neither would parents generally if they were aware of the wages sometimes offered. It will be remembered that a few months back there was some correspondence in our columns with reference to "A lucrative appointment" of twelve shillings a week, with board and lodging, for a good operator who could also print and tone well, and retouch, for seven days' labour. The advertiser, who is an "art photographer to the Queen," replied, stating that he had had thirty-one applications for the vacancy, many giving over twelve years' references. Whether the advertisement in question has led other employers to offer equally as low wages, we know not, but in recent issues were advertisements:—"Wanted, a good quick retoucher, salary twelve shillings a week; live in. Only reliable men need apply. Preference given to one able to work up in black and white." "Operator (young, good poser, and steady) wanted. Salary twenty-five shillings." "Wanted, a good operator and retoucher. All-round hand. Permanency to suitable man. Salary twelve shillings, live in." "Wanted, outdoor operator, one with own apparatus preferred. Ten shillings a week, and commission." The latter not stated. Is more skill required in laying bricks than in posing and lighting a sitter, taking a negative and retouching it, working up in black and white, &c.? Be that as it may, judging from such advertisements as those quoted, the bricklayer who obtains his ninepence and upwards an hour receives much higher wages than do some photographers. Still we see advertisements for apprentices, and "articled pupils" in photography, "with a premium," of course. Good houses, we are pleased to say, still pay good salaries to efficient hands.

The Metric System in Photography.—Every now and again the metric system of weights and measures is brought prominently before the public. This was the case twice last week: First in a paper read before the International Railway Congress, advocating its adoption, in which the author remarked that the whole of the civilised countries of the world, except Great Britain and certain of its colonies and dependencies, had adopted that system; second, the report of the Select Committee on Weights and Measures, which was issued on Thursday, which is also in favour of the metric system. Seeing that all Continental photographic formulæ are written on this system, the Photographic Club, some years ago, communicated with all the other leading photographic societies, with a view to the general adoption of the metric system in writing photographic formulæ. All who replied were in favour of the scheme, and some agreed to adopt it forthwith, as did the Club. Whether the whole of its members have adhered to their determination or not we cannot say. We suspect not. While plate-makers and manufacturers of papers, &c., issue the formulæ for their use in ounces and grains, we fear there is but little immediate prospect of the universal adoption of the metric system amongst photographers, notwithstanding that it would be an immense convenience to all. One thing that perhaps tends to retard its adoption is that the weights and measures are not kept by all dealers, and, when they are procured to order, "fancy prices" are charged for them. As a matter of fact, manufacturers charge no more for metric

measures than they do for ounce measures, with an equal number of graduations; neither do they for gramme weights; indeed, if they are of foreign make, as they generally are, they are cheaper. We have a set of weights—one centigramme up to 300 grammes, equal about ten ounces—fitted in a polished box, which cost retail something like 4*s*. Sooner or later the metric system will be universal in England; but why should photographers wait?

JOTTINGS.

One or two sentences in my remarks of a fortnight ago regarding Mr. Hector Maclean's paper on the Collodio-chloride Printing Process have, I am sorry to observe, been taken to mean something which I never intended them to convey. On the one hand, Mr. Maclean interprets me as insinuating that he was pecuniarily interested in advocating collodion in preference to gelatine; on the other, the Paget Prize Plate Company, of whose collodio-chloride paper Mr Maclean was treating, consider that I suggested either that Mr. Maclean was financially interested in their business or was bribed by them to advertise their goods. I may say at once that neither of these ideas entered my mind for a single moment; but, of course, I must take the responsibility of my own language, and abide by the meaning and sentiments that can reasonably be assigned to it. Let me, therefore, at once assure Mr. Maclean and the Paget Company of my regret at having caused them annoyance by the [unintentional] imputations to which they have taken exception.

And now, having, as I hope, made amends for my accidental "foul," I'll put on the gloves once more, for I have by no means finished with Mr. Hector Maclean. That gentleman seems to be unaware that interestedness or prejudice may spring from a variety of motives besides a pecuniary one. Indeed, I have observed that the more violent the interestedness, or the more unreasoning the particular prejudice, the more amusing and contemptible the motive for the one or the other frequently is—pride, vanity, assumed intellectual or other kinds of superiority, the indefinable attributes of personal like and dislike, and so on, all being so many motive powers of deeds and words which not unjustly incur the reproach of being "interested" or "prejudiced." And so even in the ridiculous matter of one's photographic preferences. Casting my eye over the list of photographers with whom I am acquainted, I can place my finger on the name of one whose unconcealed hatred of silver printing in any form "amounts to a disease," as Mr. Gilbert puts it; another who has a violent detestation of the hand camera; a third will not have differentiation of focus at any price; a fourth's contempt for definition is colossal. Set these men talking about their own pet photographic aversions, and they at once cast disinterestedness or impartiality to the winds. Like Mr. Maclean and gelatino-chloride printing, they all see everything that is bad in them, and are blind to what may be good.

But Mr. Maclean evidently wishes us to believe that he is not as other men are in matters of human weakness, for he loftily and confidently informs us that those who know him will "simply jeer at" my "insinuations." I sincerely congratulate Mr. Maclean on possessing the charitable regards of those who know him. My experience of life has taught me, however, that it is those who know you best who are the first to put credence in insinuations against you. Croydon, which is noted for sheltering so many remarkable photographic phenomena, would appear, from Mr. Maclean's evidence, to glory in the presence of some members of the species whose attributes are of a superhuman kind. Happy Croydon! But those who *don't* know Mr. Maclean may, and probably will, ask to be furnished with the reasons why those who *do* know him "jeer at" my insinuations, before joining in the triumphant and beautiful chorus of "jeers;" and, as I would not for worlds deprive Mr. Maclean of the sensation of pleasure that must seize him at reflecting that he may be the worthy object of the praiseful psalmody of multitudes who have never had the privilege of knowing him, I will endeavour to supply a theory which may account for the presence of the milk in the cocoanut.

Mr. Hector Maclean is, as the photographic world more than once has been informed, President of the Croydon Camera Club. A member of that Club described and introduced a few months ago a method of toning platinum prints by means of solution of catechu. It is, I have been assured, a beautiful and practical toning method, and evidently the President of the Croydon Camera Club is of the same opinion, for in this Journal of March 1 he writes an article descriptive and commendatory of the process. Inasmuch as the patent specification, which had previously been published on December 14, 1894, gave very full working instructions, it might have been thought that it was unnecessary to repeat them, but with enviable courage Mr. Maclean goes over the beaten track, and, bravely indifferent to possible unkind suggestions of slipping in a gratuitous advertisement, obligingly says where the powder may be obtained. Under all the circumstances of the case, it might have occurred to most ordinary men in Mr. Maclean's position to have left it to some other pen than his own to deal with this subject; but he is privileged to be indifferent to mere questions of discretion and expediency, and with wonderful daring has set an example to the Presidents of other Photographic Societies to allow no obstacles to stand in the way of their adding to our photographic knowledge. Is it to be marvelled at, therefore, that those who know Mr. Maclean "jeer" at me for presuming to doubt his disinterestedness? which may further be illustrated by an article, by the same author, in the Almanac for 1894. This, even though the name of the photographer who was interviewed is omitted, may readily be seen to be so free of interestedness or personal preference that it is possibly calculated to make Mr. Maclean's friends "jeer" at—somebody else besides me.

As regards the drawbacks to which gelatine prints are liable, Mr. Maclean now says: 'It is, of course, common knowledge that gelatine paper does not *always* exhibit all or any of the faults I drew attention to; none the less, each separate print is liable, under ordinary working conditions, to develop one or more of the defects spoken of by me." This is a far more reasonable and common-sense way of discussing the faults and failings of a process than that originally adopted by Mr. Maclean and against which I protested. I don't care two straws which survives, gelatine or collodion (by the way Mr. Maclean appears to be ignorant that collodio-chloride printing is of considerable antiquity), but, as I said before, let us discuss the merits and demerits of rival processes practically and scientifically, and not at random. So now, Mr. Maclean, you know how to escape my "peculiar politeness" and "acidity."

A timely article on photo-ceramics appears in *Autotype Notes* for this month. The writer is Mr. W. S. Bird, and he describes the difficulties his firm encountered in working the process. Between the years 1879 and 1884 an expenditure of not less than 2000*l*. was incurred, while the sales did not exceed 300*l*. It is true that the method adopted was neither what is known as the substitution process nor the dusting-on process, being "an offshoot of the carbon process, enamel pigments being used in the tissue, which was sensitised, printed, and transferred to the surface of the porcelain in the usual manner," and the difficulties met with may therefore not unreasonably be ascribed in part to the characteristics of the process employed; but, from all I can gather, the generally accepted methods of working above named, notwithstanding their apparent simplicity and seductiveness, are so crowded with possible sources of failure that it would be sheer folly for a photographer to undertake either process unless he was prepared to spend months in getting his method in working order, and gave to it a constant and unremitting attention. I hope, and I am sure everybody hopes, that ceramics will become popular, but it is nothing less than cruel to induce an ordinary working photographer to attempt their production. Mr. Bird's concluding words are worth quoting, for they enshrine wise advice. He says: "It does not absolutely follow that ceramic photography cannot in 1895 be made to pay. If photographers can send their negatives to professional workers, and obtain in reasonable time and at moderate cost successful enamels, and find a demand for the same, all well and good; but, if they care to profit by the

experience of others, they will abjure photo-ceramics as an addition to their practice."

The Rev. F. C. Lambert who some time ago at the Camera Club girded at the shortcomings of the photographic critics, has a fine opportunity of poking fun at them for the manner in which they treated the Photographic Exhibition held last week at the Agricultural Hall. Between four and five hundred photographs were placed on view. One critic occupies nearly five pages of his paper in passing the photographs in review; another modestly contents himself with a page; a third simply gives the awards, and prefaces them by some amusing chaff at the association of photography with tobacco, not attempting a line of detailed "criticism;" a fourth also merely reprints the awards, and hazards the sweeping and solitary critical opinion that the classing of the medalled pictures together was advantageous, but that some of the galleries were hardly worth more than a mere cursory glance. How Mr. Lambert must chuckle, to be sure!

I must congratulate Messrs. Elliott & Son of Barnet on the neat get-up and readableness of the new series of their quarterly pamphlet, *The Photographers' Record*. Like everything photographic that has its source of origin at Barnet it is well done. That master of hand-camera work, Mr. W. Thomas, contributes *Some Notes on Hand-camera Work*, which are brief and to the point, and, though brief and pointed, are as full of sound advice as an egg is of meat.

It is always a pleasure to me to engage in a friendly duel with Mr. D. J. O'Neill, the Secretary of the National Association of Professional Photographers. He opposes a firm and manly front to an attack, gives blow for blow right earnestly, and sticks up for the National Association of Professional Photographers with a thorough-going enthusiasm, which is certainly worthier of a better cause. He meets my suggestion that the National Association of Professional Photographers should abrogate their private excursions, and join forces with the Convention, by emphatically denying that the latter is of "any use" to professionals. What "use" is the National Association of Professional Photographers' outing to *its* members? According to the official account of this function, it is nothing more nor less than what Mr. O'Neill stigmatises the Convention as being, "a pleasant outing." As to the papers and discussions, and the presence of amateurs and dealers, the first are, I take it, simply an official excuse for holding the Convention, and need not be sat out by anybody not in the mood, while the admixture of amateurs, professionals, and dealers cannot possibly do harm, and might conceivably be beneficial in bringing about a better feeling among all interested in photography, and also promote the great end Mr. O'Neill so pointedly desiderates, viz., the enabling of professionals to make money out of amateurs. If Mr. O'Neill will scrutinise the records of the Convention during its nine years of existence, he will find that very many of its most consistent and foremost members are professionals, who apparently see no drawback, but rather the opposite, in freely associating with amateurs and manufacturers. Surely I could adduce no more cogent argument in support of my suggested fusion of the two bodies for "outing" purposes? Union is strength, even in pleasure-going.

Photography is playing a large part in the General Election that is at present afflicting the country. A morning paper delivers itself of the following remarks on election portraiture: "Nearly every candidate nowadays prints a portrait of himself at the head of his address to the electors. To say that these works of art are in many cases highly flattering would be to put the matter far too mildly. In almost every instance the politician's countenance is etherealised into a thing of beauty in such a way that even his creditors—if he had any—might be excused for failing to recognise him. Possibly every Parliamentary candidate is naturally an Adonis, but it hardly seems likely; and by what magic have they all managed to get 'taken' without that particularly stiff, not to say wooden, look which characterises the ordinary photographer's subject? The explanation probably is that the portraits have been 'touched up' and improved. Yet this may not be sound electioneering policy after all. An individual who looks too provokingly handsome may secure the envy rather than the vote of the electors, who will proceed to 'take the conceit out of him' by voting for his opponent. We should be inclined to recommend candidates to try a little judicious ugliness for a change."

I have seen a good many of these election portraits, and, as regards their "beauty," all I can say is that, if they flatter the aspiring originals, the poor gentlemen must indeed be veritable Calibans—miracles of ugliness. The remarks I have quoted are, of course, full of exaggeration, as might only have been expected while the election fever is about, when political writers, above all people, are apt to lose their heads; but it is curious to note how tenacious of existence is the old libel that photographers are incapable of giving their sitters any but a stiff and wooden look.

I received recently an "in memoriam" card of a deceased friend. On one side of the card is mounted a small photograph of the departed. I don't know whether this kind of portrait photography is at all common—at any rate, it is the first example I have received, and I allude to the matter in case there may be others in a similar condition of ignorance to my own who are in a position to profit by the hint.

Overheard in a dealer's shop. Photographer: "Tube of gold, please." Dealer: "That all?" Photographer: "Yes, that's all." Dealer (grumblingly): "Why don't you buy your gold where you buy your paper?"

COSMOS.

MOVING OBJECTS AND PICTORIAL PHOTOGRAPHY.*

FOR the same reason as avoiding the posed model, it is necessary to work very cautiously in getting villagers to go out of their way to better assist the composition, or even in allowing them to know that they are included. With children there is not so much risk, as after a few minutes they drift back into natural positions and movements, and then the photographer can watch for his opportunity. With some animals there is no alternative but to wait; a flock of sheep can sometimes be obtained in a good position by the assistance of an obliging shepherd, or a few ducks coaxed a hundred yards or so up a stream by the judicious use of a biscuit or two. In all cases much of the final success will depend on the selection of the correct position and right moment to expose. It is surprising how long an exposure can be given with actually moving objects by attention to this point; frequently half a second, or even a second, will show little or no actual movement, but still the positions will well suggest the characteristic movements or actions that it is desired to represent. Not the least of the advantages of a shutter for subjects of this character is the fact that the exposure can be made without looking at the camera, and consequently undivided attention can be given to the subject, studying the movement and determining the best moment to expose. This advantage, however, is equally available for other subjects. Who has not experienced the difficulty of watching and waiting for moving foliage to be comparatively still, and then having to turn away to make an exposure of two or three seconds with the lens cap? The greater certainty and comfort of working with a time shutter is unquestionable, there is no risk of shaking the camera nor of fogging the plate by reflections, as may sometimes result from a hurried removal and replacing of the cap.

The second group of subjects will be those that may be termed "pictorial instantaneous," in which the successful representation of movement is utilised to form a picture. The subject chosen must be one whose appearance is different when in motion from that when at rest, or one that never is at rest, and whose reproduction will give such evidence of movement as to naturally convey that impression. Very few other than boating or marine subjects will conform to this definition; many instantaneous photographs are not pictorial in themselves, while others, in addition, give no evidence of movement; a moving train, for example, will appear as if standing still. Breaking waves, either gracefully curling on a sandy beach, or wildly dashing over a rough rocky shore; yachting at sea or on a river, or fishing boats on the open sea, or sailing out of a harbour, or returning with the result of their perilous calling, will all repay the photographer for the care and skill that he may be able to devote to their delineation. There is to some the additional charm of the uncertainty and excitement that it is impossible to dissociate from this work. Naturally, it is far easier to work from the mouth of a har

* Concluded from page 426.

bour for marine subjects, or from the shore for river scenes, than from a moving boat, and, although many subjects cannot be attempted except from a boat following or cruising specially for photographing, yet the greater difficulty should deter any one from working under these conditions, until he has experienced how few really successful pictorial results can be secured, for a dozen plates exposed with the greatest care and discretion, from the end of a pier. The direction and character of the movement will necessarily determine how brief must be the duration of exposure, while a slight movement on the plate is permissible; yet, if this be too great, there will not be sufficient crispness in the resulting picture. It is sometimes asserted that too short an exposure destroys all evidence of movement, that breaking waves, for example, look as if frozen. This contention certainly appears untenable; either there must be almost the same degree of sharpness that is necessary in a landscape of the same size, in order to secure sufficient crispness in the print, or else there will be a wooliness or want of definiteness that would convey a very different impression from the sharply defined moving object that the eye follows. What is really seen in nature is a series of positions or movements, and the most important condition for the successful representation of that movement is the selection of a characteristic phase, or position, or direction of motion relative to the camera. It is very rare that circumstances will require exposures to be much briefer than one-twenty-fifth of a second for purely pictorial work, certainly never quicker than one-fortieth, assuming working from the end of a pier or other fixed standpoint, as it is never advisable to represent a boat broadside; the gracefulness of the lines of the boat itself and the delineation of its movements are far better when the direction of that movement is more or less oblique.

The duration of the exposure is a very important item in photographing moving objects, and it is sometimes difficult to allow sufficient time for the plate to be fully exposed without too great a movement of the object being registered. Nearly all the landscapes in which figures, &c., are desirable accessories will require from one-eighth to half a second, according to intensity and character of the nearest important shadow and its distance from the camera, the majority requiring about a quarter of a second, and boats on the open sea from one-sixteenth to one-thirtieth of a second, according to their distance, colour, &c. These exposures are given as being sufficient to secure full detail and softness of gradation under the best conditions of light, using aperture *f*-16 and Edwards's medium isochromatic plates, or others of similar speed, *i.e.*, most modern medium rapid plates sold as "ordinary."

Proportionately longer must be given late in the day or in dull weather.

In determining how far the exposure may be prolonged without undue blurring of the image, the direction in which the object is moving relative to the camera is of far greater importance than its actual speed; when the motion is directly towards the observer, it is safe to give from ten to sixteen or even twenty times that which would be permissible if it were at right angles. When the direction is oblique, in proportion as it approaches the axis of the lens, the exposure can be safely lengthened. The actual duration of the exposure will depend on the amount of blurring considered permissible. It is impracticable to fix any fraction of an inch as a limit, since this must depend largely on the size of the picture. An amount, as defined by actual measurement, that would be scarcely noticeable in a whole-plate direct print, would be a serious defect in a quarter-plate intended for subsequent enlargement. It is far better to fix the amount proportional to the size of the image, that is, make the exposure the same in either instance.

In my own practice it has been found that in landscapes with natural figures, &c., a quarter of a second can always be given without objectionable blurring, and sometimes half and even a full second. In photographing boats from a fixed standpoint, from one-sixteenth to one-twenty-fifth of a second will almost always secure sufficient crispness, if the movement is at a greater angle than forty-five degrees; a sharp image has been obtained with an eighth of a second, though, on the other hand, if the sea be rough, the consequent rocking of boats necessitates considerably lengthening the exposure.

In comparing these figures with those given for obtaining fully exposed negatives, it will be seen that it is almost always practicable to work with *f*-16 and plates of medium rapidity, and secure a crisp rendering of figures in landscapes with the decided charm that natural movements, actions, and dress must unquestionably give. Equally, marine subjects can be successfully rendered with the same plates and *f*-16 or *f*-11, assuming working in a fair light in either case. Plates of medium rapidity are advocated, because in my hands a far better quality of negative has always been obtained on them than on quicker, the gradation is softer and more harmonious, the shadow detail better rendered, while the extreme shadows are clearer, and there is ample density in the high lights. In practice it will be found that the extra speed of the most rapid plates is not nearly so great as claimed; it is not sufficient to compensate for the difference in quality of result. While the actual choice of a plate is largely a matter of individual taste, my most successful work has been on Edwards's medium isochromatic; and in dull weather especially a decided gain has been experienced in their isochromatic qualities. Harmonious and vigorous negatives of marine subjects have been obtained when it has been found impossible to succeed on ordinary plates.

In regard to the camera, it is only necessary to say that firmness, rigidity, and simplicity are of greater importance than lightness.

The most useful lens is a rapid rectilinear, whose focus is about one and a half times the longer side of the plate, or rather less, and the apertures giving the most satisfactory compromise between rapidity and depth of definition, *f*-16 and *f*-22 for landscapes, generally the former, and *f*-16 and *f*-11 for marine work. The full aperture of a rapid rectilinear is almost useless on account of the inequality of illumination, and, for the same reason, *f*-11 should not be used unless absolutely necessary. Negatives taken with the full aperture, *f*-8, have required their ends and corners shielding for half the time necessary for printing the centre, in order that an expanse of water might be uniform in depth of tone. When the focus of the lens is longer in proportion to the size of the plate, this defect is lessened, but a lens of longer focus than that specified is not desirable; in ordinary work too little subject, and that on too large a scale, would generally be included, and for marine subjects it would give too flat a lighting, and insufficient contrast and relief in the nearest water.

The shutter must necessarily command very careful consideration; to be available for all work, it should be constructed to give either instantaneous or time exposures, and for the former adjustable in speed. It should be simple in construction, so as not to get out of working order easily, certain and reliable in action under all conditions of weather. There should be no risk of fogging the plate while waiting to make an exposure through its not being safe against the admission of light; it must work free from vibration, and the opening in the moving part should be long, so as to secure the full value of the lens aperture for as large a proportion as possible of the total time of exposure. A pneumatic release is an absolute necessity; whether the image is being followed in a finder, or a favourable opportunity being waited for foliage or figures to be comparatively still, the advantage of being able to make the exposure without releasing the attention cannot be over-estimated.

The Thornton-Pickard is my favourite, fulfilling, as nearly as can be expected in practice, the requirements of an ideal shutter; it is available either for time exposures, from a quarter second upwards, or for instantaneous, ranging between one-eighth and one-sixtieth of a second. A drop shutter, for instantaneous work only, may be made very certain and reliable in working, and perfectly light-tight, as shown in the illustration of my own pattern on page 546 of The British Journal Photographic Almanac for 1891. Some of my most successful results have been secured with this shutter; its exposures can be made to vary between one-tenth and one-fortieth of a second.

A finder is of the greatest importance in rapid or instantaneous work. The camera can be focussed, the shutter set ready for exposure, the slide shutter drawn, and the image followed in the finder until the sizes and positions of the objects are satisfactory, when the exposure can be made. On the water, distance is very deceptive, and it is the invariable experience of those who commence work of this kind without a finder that a boat that they imagined would almost fill the plate will, when developed, be so small as to be absolutely useless; in addition, there is the difficulty, if not the impossibility, of securing just what is wanted in groups of boats, or breaking waves, or even the position of a single boat, unless a satisfactory finder is used. In ordinary work it will frequently be found of almost equal value. A landscape composition may be satisfactory, excepting that some figures are wanting to complete it. These may be waited for so long that, when available, it may be difficult to realise, in regarding the scene and its surroundings, their value and proportion in the part that will appear on the plate; or it may be that, even if a position has been carefully determined, they may take a slightly different course from that expected, and then a finder will be of great assistance in assigning a satisfactory position. A duplicate camera is the best and most reliable form of finder. While it is neither necessary nor even desirable that it should be the same size as that in which the negative is being taken, yet it is absolutely essential that the images in the two should be identical in composition and limits. For this reason the relation between the screen and the focus of the lens in the finder must be exactly the same as in the camera. It should be constructed so that it works with the rising front of the camera, and be adjustable for vertical and horizontal pictures. The top of the camera will generally be found the best position. A finder of this description has the great advantage over some other forms that it prevents anything beyond the actual field or limits of the picture from being seen, and, consequently, the surroundings do not influence the worker in determining on an exposure. In following the changing image in a finder, it is important to remember that a succession of movements, and sometimes very pleasing combinations, are seen, but that the success or failure of the picture will depend on the critical moment of making the exposure, whether the movement is expressed and the composition satisfactory.

In the finder shown the baseboard is attached to the top of the back frame of the camera by lifting hinges, and rests on the rising front. By this means each movement of the latter, by tilting the whole finder, ensures a corresponding movement of the image on both screens. The lens has a focus of six inches, the length of the screen being four and three-eighth inches. The camera is a whole-plate, the focus of its lens being eleven and a half inches; the images in each are consequently identical. A square screen with a rectangular opening is fitted, similar to the reversing back of an ordinary camera.

A very useful addition to the apparatus necessary for instantaneous work is a focussing scale. A flat slip of wood has the distances carefully

marked on one edge, that there must be between the front and back frames of the camera, when objects at 25, 50, 100, 200 feet, &c., are in sharpest focus. To construct it, an object at a measured distance, preferably between twenty and sixty feet, is very carefully focussed, and the length between the frames accurately marked on the scale; from this, if the focus of the lens is approximately known, any other distance can easily be calculated. On account of the curvature of the field of most lenses, it will be found desirable to have two sets of gradations, one for the centre of the plate, the other for a point midway between this and the edge, or one-third the length from the end. By means of this simple instrument the camera can be erected and set ready for making an exposure when there is nothing but the open sea before it; and differences in focus adjusted to suit the distance of the object and its position on the plate, with every variation in the work. In most marine subjects the distances will range between 100 and 200 feet, this depending naturally on the size of the boat and the proportion of the plate that it is desired it should occupy. A small boat will rarely be photographed nearer than 80 to 100 feet, and, though a very large one may be taken at 300 feet, or even farther, a setting for 200 or 250 will not necessitate any further adjusting. It is not practicable in the modern type of camera to mark the baseboard or other moving part, as a very slight want of parallelism between the front and the back would render such marking worse than useless.

It should be stated that these observations are intended throughout to apply to pictures not larger than whole-plate. In larger sizes the mechanical and optical difficulties are considerably increased, and working as proposed would in many cases be impossible.

Some of the opinions expressed and methods of working advocated may be considered unorthodox or undesirable, but the conclusion formed from systematic working under very varied conditions is that, if used with judgment and discretion, the mechanical shutter may be of great value as an aid to picture-making; it will secure results that would without it be unattainable.

HENRY W. BENNETT.

THE PHOTOGRAPHIC NATURALIST.

II.—ANIMAL PHOTOGRAPHY.

Introductory.—We have now to consider to what extent the zoologist will be able to derive assistance from photography, and what method he can most profitably employ in the several departments of his studies of animal life. The botanist, as we saw in a former article,* uses chiefly isochromatic plates, colour screens, and prolonged exposures, but in animal photography it is necessary to employ rapid processes, assisted by suitable instantaneous shutters, as well as special contrivances for keeping the animal in view up to the time of exposure. It is true that admirable results in animal photography were obtained even in the early days of the wet-collodion process, and studies of swans, deer, cattle, and sheep have always been familiar subjects in photographic Exhibitions. But wild animals have always presented peculiar difficulties, which the wet-plate photographer only overcame by the exercise of an almost incredible amount of patience and laborious study. The early successes of Haes, and the later achievements of Anschütz and Gambier Bolton, are classic monuments of photographic skill and perseverance which every naturalist would do well to copy.

It often happens in animal photography that the position of an animal which looks most artistic is not the most satisfactory from a naturalist's point of view. Snap-shots of animals in motion also often look grotesque, and give but a poor idea of their true proportions and general appearance. A typical animal photograph should show every detail of fur or feather as sharply as in a portrait, and the proportions of the body should not be distorted by the exaggerated perspective of an unsuitable lens. To secure these results, the early animal photographers gave time exposures, with fixed cameras, often of large size. By a careful study of the habits of the animal, and with much patient watching of opportunities, they thus secured results of the utmost scientific value. But this method is not always possible. Animal photography in the jungle or desert is practised under conditions which bear but little resemblance to the photography of caged animals in a zoological collection. To the traveller, therefore, to whom of all others the naturalist looks for faithful records of wild animals amidst their natural surroundings, special appliances are necessary for successful results.

Naturalists' Cameras.—Success in all instantaneous work depends in a great measure upon ability to find and focus quickly, and in animal photography it is absolutely essential that the operator should be able to view the animal and adjust the focus right up to the time of exposure. Anschütz, in his earlier attempts, measured certain spots on the track of the animal, placing whitewashed stones as a guide, and waiting patiently for the animal to occupy the right position, a method which not only loses time but would be useless to a traveller coming unawares upon his prey. One of the earliest devices to overcome this difficulty was Sutton's reflecting camera, made in 1861. In this camera a mirror, placed at an angle of forty-five degrees with the horizon, intercepted the rays from the lens, and not only shielded the sensitive plate, but also reflected the image upwards upon a focussing screen in the top of the camera. The operator could thus watch the screen upon which the image, not reversed, could be focussed until, at the moment of exposure, the mirror was made to fly upwards, uncovering the sensitive plate, and also automatically capping the lens after exposure.

This principle has been still further improved in Dallmeyer's Naturalist's camera, recently put into the market; but with this important difference, instead of a focussing screen the animal is viewed through a telescope, and by means of a tele-photo lens it is possible to secure portraits at a distance at which an ordinary lens would be useless. Personal experience of the working of this camera has convinced the writer of the high qualities which it possesses for purposes of natural history.

Other workers have adopted the plan of a supplementary camera, with a lens of identically the same focus as the working lens. The two cameras were both focussed simultaneously by the same motion. This method was still further elaborated by Marc Ferrez, who used a large camera, upon the top of which a smaller one was fixed. The lens of the latter was connected by a lever with the working lens, and the difference in focal length of the two lenses was thus adjusted on the principle of the proportional compass.

The Jumelle opera-glass camera of thirty years ago was a simple adaptation of the principle of supplementary cameras, one barrel being used for focussing, the other as the working camera. A recent revival of this idea has led to the introduction of various forms of binocular hand cameras, but the small size of the pictures is a great objection to the practical utility of this simple method.

In 1886 Mr. Traill Taylor showed how a supplementary telescope to act as a finder could be easily adjusted to have the same focal length as the camera lens. Remembering that the separation of a concave and a convex lens shortens focus, while the separation of two convex lenses lengthens focus, it is easy to fit two spectacle lenses in a mounting with a diaphragm between them, and to adjust them exactly to any required focus. Each separate lens should be nearly twice the focal length of the camera lens. At the same time he gave the following convenient formula for finding the focal length of any combination:—

$$f=\frac{f_1 f_2}{f_1+f_2-S},$$

where f_1 f_2 are the focal lengths of the separate lenses, and S their separation.

Of the multitude of ordinary hand cameras now in the market there is little to be said from a naturalist's point of view unless they possess the above-mentioned requisites; and, of the innumerable shutters available, the best workers in animal photography give almost unanimous preference to the roller-blind shutter, with adjustable slit, working next to the sensitive plate.

In conclusion it may be useful to summarise briefly the points which the naturalist should look for in the selection of any form of hand camera.

(*a*) *Weight and Volume.*—Too light a camera will jar when the shutter is released; too compact a camera, if folded, will not be ready for unexpected occasions.

(*b*) *Sharpness of Image.*—Fixed focus lenses are useless; focus marks for fixed distances are a delusion in practice; twin lenses are efficient if the image is not too small; tele-photo lenses are best.

(*c*) *Mechanism* must be simple; shutter must work next the plate, and be capable of resetting when the plate is in position without admitting light.

(*d*) *Efficiency.*—The lens should work at *f*-8 or *f*-15 at will, according to the light.

The photographic requirements of the zoologist are so varied in character that no single apparatus could be found to meet all contingencies. A beginner is advised, however, to first master the difficulties of a good hand camera, which, if well selected, should suffice for the greater part of his wants. We now proceed to consider the apparatus required for some special branches of study.

Chrono-photographic Apparatus for Naturalists.—The analysis of animal movements which are too rapid for the eye to follow can now be readily accomplished by the photographic camera. As attempts are now being made to simplify the rather elaborate methods employed for this purpose, it may be useful to give a brief outline of the principles upon which Muybridge and Marey have

* THE BRITISH JOURNAL OF PHOTOGRAPHY, vol. xlii. p. 24 (January 11, 1895).

worked before detailing the proposed simplifications which promise to bring chrono-photography within the reach of every naturalist. Muybridge made his first experiment in 1877, using a battery of cameras—about forty in number—which were exposed by the animals themselves coming into contact with electric threads attached to the shutters of his lenses. The objection to this method is that, although the exposures did not exceed the one-thousandth part of a second, the successive images were all taken from different points of view. Marey therefore tried using a single camera with a fixed plate, in front of which rotated a slitted disc. The object to be photographed was made to move before a black background, so that he obtained a series of images numerous in proportion to the rapidity of rotation and number of slits in the disc. The obvious result of this method is that, if the object moves too slowly, the successive images will be all superimposed upon one another, with much resulting confusion. To overcome this he was compelled, in the case of a man walking, to reduce his model to simple lines by dressing him in black, with bright strips to mark the skeleton. Later, Marey produced greater separation of the successive images, and made even stationary movements visible by using a rotating mirror to reflect the image through the lens on to the sensitive plate. A still further advance was made by employing, instead of the fixed plate, a film which unrolled from one cylinder on to another, stopping momentarily while the shutter acts. It is just this momentary stoppage of the film, however, which complicates the mechanism and entails a prohibitive expense. Nevertheless, this method is far superior either to the battery of cameras or to the superimposed images on a fixed plate.

Quite lately Marey's photo-chronograph has been simplified by M. Georges Demeny in a way which obviates all the complexity of the mechanism for automatically stopping the film.* The cylinders upon which the film is rolled are mounted, one axially and the other excentrically. The rotation of one cylinder exerts a traction on the film, which unrolls it from the other cylinder; but, owing to the excentric mounting, there is a moment when the two cylinders are nearest each other, when the traction momentarily ceases. It is during this short interval that the exposure takes place. Not only is the expense greatly reduced by this device, but the weight is also so far diminished that Demeny's apparatus can be used as a hand camera, and either a single image or a whole series can be obtained at will.

J. Vincent Elsden.

(To be continued.)

A VISIT TO MESSRS. MORGAN & KIDD, RICHMOND.

Especially pleased were we to avail ourselves of the opportunity of revisiting the familiar and busy works of Messrs. Morgan & Kidd at Richmond one day last week, as we were justified in anticipating, from former experiences, that we should find this vigilant and go-ahead house not only active in pursuing the well-recognised and established branches of their business, but also armed with the newest and latest departures or introductions in photographic printing. Both anticipations were fully realised.

Photo-Ceramics.

Our readers may have observed that for some time past certain efforts have been made to promote among photographers a practical interest in photo-ceramics, with the view of improving business. That movement has our best wishes, although we are doubtful whether, given a public demand for ceramic photographs, it would be within the scope of any but a very few photographers to engage in their preparation. Be that as it may, it is of interest to note that the late Mr. R. L. Kidd, of the firm of Morgan & Kidd, applied himself, with his customary vigour and thoroughness, about a year before his lamented death, to experimental work in photo-ceramics, convinced that there would be a lucrative field and future for this class of photograph. The work interrupted by Mr. Kidd's death was next taken in hand by Mr. E. C. Morgan, who having, after considerable labour, adapted the process selected—that known as the powder or "dusting-on" process—to the requirements of rapidity and reliability of commercial production, has now the satisfaction of pointing to a photo-ceramic department, in which, by the aid of highly skilled assistance, the process is worked with an ease and smoothness which is as charming to witness as the results are to contemplate.

Messrs. Morgan & Kidd's idea in undertaking the production of such photographic luxuries as ceramic positives, is that many photographers will find among their clients numbers of persons who would welcome the opportunity of securing a class of photograph which shall supply a pleasing and attractive alternative or complement to ordinary prints or enlargements; which should, in fact, constitute an excellent and unconventional form in which to supply a photographic present, or memento of abiding interest. As meeting these conditions no form of photographic positive can be named as excelling the ceramic enamel, which takes the place of the out-of-date miniature, and in beauty and permanency of image is unsurpassable. Photographers, therefore, should endeavour to indoctrinate their sitters and patrons with the charms and advantages of ceramic photographs; the results will assuredly be mutually agreeable.

"Come and see a ceramic photograph made from start to finish," said Mr. Morgan to us, and in a few minutes we were in the ceramic room, seeing what we could see. This is what we saw: Let the reader turn to page 853 of our last Almanac and he will find three formulæ for the sensitising solution of the dusting-on process. A cleaned glass plate was coated with one such solution which consists of a bichromatised mixture of gum and saccharine matter, and the film dried over the heat of a flame. A transparency, developed with ferrous oxalate, and having full detail in the lights, with no deep or heavy shadows, was next placed in contact with the film and the exposure, timed by an actinometer, made to daylight. Development, which results in a positive from a positive, was conducted by gently applying the vitrifiable powder which is to form the ultimate picture to the moist image, the positive being thus evenly and gradually built up, as it were. The plate was then coated with plain collodion, immersed in a four per cent. solution of caustic potash to remove the bichromate, the film being then, in a dish of plain water, detached from the glass and floated and smoothed into position on the plaque. The film having been dried by heat, the process of firing was taken in hand. This consisted of first burning off the collodion in the gas furnace, and, the latter being raised to a cherry-red heat, the picture was examined for spots, which being removed, the next operation was to partly fire the image, at which stage the necessary touching up with the vitrifiable powder is effected. The final stage of firing is then given, a red-hot semi transparent appearance of the plaque indicating completion. In a few minutes the plaque was cooled, placed in its frame, and handed to us—a finished and beautiful ceramic photograph, produced in far less time than it has taken us to write this description.

"A pretty process," said Mr. Morgan, "and looking extremely easy." But those who undertake it, and this we say on our own responsibility, must certainly be prepared to devote months of unremitting attention to it before good results may be hoped for. A recent statement that it can be mastered in twelve hours is, to say the least of it, likely to give a photographer an altogether false idea of what awaits him if he is rash enough to venture into the domain of photo-ceramics with the idea that the new department can be worked in with the other branches of his business.

Cream Crayon Paper.

This is a new introduction of Messrs. Morgan & Kidd's, consisting of a cream-tinted paper coated with gelatino-bromide emulsion. For enlargements, it is highly pleasing. The firm themselves employ it for producing what they term "Mulready" effect enlargements, these being finished in black and red chalk to give the appearance of the well-known Mulready picture. It is a paper which lends itself to production of the most artistic effects.

The Rose Enamel paper is a tinted, highly surfaced bromide paper, results upon which bear a striking resemblance to varnished collotypes. Very great activity reigns in the collotype and half-tone departments, superinduced by the General Election, and it is needless to say that the enlarging and finishing rooms present the same busy appearance as heretofore, the work having that high quality which always distinguishes the firm's productions.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

VII.

In my last, when referring to the copying of old or faded documents, I referred to a simple method whereby a print may be made to assume a similarity of colour to the faded appearance generally met with in such old originals. An operator, however, cannot always rely upon being able to obtain possession of many an old and frequently a highly valuable document or book, so as to enable him to copy such in his studio or premises, the lighting of which he is thoroughly conversant with.

A very frequent call is made upon a photographer to undertake this class of work away from his business premises, in such places as public libraries, the strict rules of which absolutely prohibit the librarian from permitting such documents to leave his possession or control. There is, therefore, no alternative but to arrange for the copying being done in such places, where, very often, but scanty accommodation and poor daylight exist.

It has fallen to my lot to do a good deal of this kind of work in such places, and I have always found success attend my efforts when working on the following lines.

I need not here again repeat what I have described in a former article as to the best method to employ for holding books and documents *in situ* for the purpose of copying further than to say that the same plan of working holds good in outside situations as is applicable in ordinary studios or business premises

* *La Nature* (September 29, 1894), page 279.

In every outside place that I ever had occasion to operate in, I never failed to secure an ordinary sitting form. This I find to be by far and away the best possible substitute for a copying board, thereby dispensing with the necessity of any tripod or stand, and a kind word and pleasant manner to those in attendance in public places will go a long way towards being able to secure any other requisite article an operator may require. This may mean a couple of tables or boxes whereon to elevate the form to a comfortable working height. The possession of a long form (of course without a cushion or back to it) enables an operator to overcome nearly every difficulty, for no better support can be found for the camera than such affords, enabling, as it does, the same to be easily adjusted backwards or forwards, and absolutely parallel to the object it is desired to photograph, provided the latter has been set up square on its support at the end or other suitable part of the form.

The lighting, of course, is a most important factor, and one that any operator of experience knows well must receive the most special attention at his hands. Nearly every public building or library at the present time is fitted up with an installation of electric light, and, when such temporary fittings as I have referred to as necessary for copying can be arranged in positions whereby such lighting may be utilised, excellent results follow its use.

Daylight, of course, should always be employed where possible, and every librarian that I ever had the pleasure of meeting was only too willing to arrange for access to such parts of his premises as were judged to be the most suitable for the purpose, and in all public libraries there is sure to be found one spot generally acknowledged as the most suitable, and therefore set apart for such work as we are considering. I have had, however, on several occasions, to provide paraffin lamps for this work, and, when such have been used at home for a similar purpose, they enable an operator to judge his exposures to a nicety. This is more than can be said for daylight when working in confined situations, or when any other unknown artificial illumination is employed.

Six double backs, charged before leaving home, will generally suffice for a day's work, and render the use of a dark room unnecessary, and the most suitable plate to employ depends upon the class of subject that has to be photographed.

In copying documents the question of size is frequently of importance, and here again the long form that I have referred to for holding the camera comes in very handy. A large pair of dividers being set to the exact size of image required, the camera is easily moved along the form until the image on the ground glass corresponds exactly with the set of the divider.

I would here refer to the distinct advantage which attends employing plates that have been specially prepared with a non-halation backing. The difference in results obtained by using such in place of unbacked plates is at times quite startling. In the one case the long exposures necessary will yield a soft and somewhat blurred edge to much of the printed or written matter present in the original, whereas the backed plate will yield negatives in which such writings or printed matter will come out only with beautifully clean, sharp-cut edges that are very striking.

As to the best backing to employ, I have no hesitation in saying that I know of nothing to equal bitumen dissolved in chloroform and benzine. The bitumen should be in quantity sufficient to yield a distinctly rich golden colour to the back of the plate. One of the advantages of using bitumen lies in the rapidity with which it will dry after being applied with a broad camel's-hair brush. The use of a brush is preferable to flowing the solution on like collodion, because it prevents the risk of the bitumen getting over the sides and on to the face of the plate, and the best time to apply it is when the plates are placed in the cells of the dark slide. In applying this backing there is no need to go quite up to the extreme edges of the plate, provided a large enough one is employed to allow of a comfortable working margin. This latter factor is one that, in copying, often does not receive the amount of attention it deserves. The using of a plate that just barely permits the image being crammed upon it more often ends in failure than anything else, and is false economy in the long run, whereas, when an operator knows he has a comfortable margin to come and go on, very much of the difficulty attendant upon working to the exact size required will vanish, and much comfort will be experienced where otherwise nothing but trouble and doubt prevail.

After exposure, and prior to development, there is no need to remove the bitumen from the back of the plate. Such can be dealt with after the negative is finished and dried. A little benzine applied with a clean rag will remove it as if by magic.

In cases where the most minute specks or marks have to be maintained exactly as they appear in the original, it will be at once apparent that no retouching or dodging up of the negative should be resorted to without a close inspection of such alongside the original; this often means very close scrutiny of both, and requires the minutest observation. It will almost always be found that patches are present in the negative that it would be fatal to deal with otherwise than alongside and after a close scrutiny of the document.

It therefore stands to reason that the utmost care must be observed to employ only such plates for this work as are absolutely free from flaws or mechanical defects, and it is also a good plan to make duplicate exposure with the view of obviating such failures, otherwise all the trouble and time expended would require to be gone over again.

T. N. Armstrong.

NEW PRINTING AND ENLARGING WORKS AT TWICKENHAM.

That there is still a wide field available for high-class photographic printing, enlarging, &c., is evidenced by the success that has already attended the Richmond Collotype Printing Company, Limited, a company only very recently formed, with Mr. Henry Berghoff as managing director. Notwithstanding that his works are scarcely yet in proper going order, and that chaos has not quite taken its departure in company with that man of procrastination, the builder, Mr. Berghoff, on the occasion of our recent visit, assured us, and gave us ocular demonstration of the fact, that orders were pouring in upon him to a very gratifying extent.

Situated in a quiet and secluded part of Twickenham (Montpelier-road), two private houses and a disused chapel have been adapted for the varied requirements of the new Company. The chapel now becomes a collotype machine room, in which three of Schmiers, Werner, and Steins' machines are at work, room being available for five more, which will shortly be put down. The various other departments of half-tone etching, enlarging on bromide, carbon, and platinum, frame-making, accommodation for several artists, dark rooms, collotype-plate drying rooms are all duly provided for, and the Twickenham Works will ultimately form a very complete and compact installation, calculated to turn out good work and plenty of it.

"Good work"—the best, in fine—is to be the sheet-anchor of the new Company. Naturally, collotype is to be a leading department, and Mr. Berghoff intends devoting himself to the production of only the very best and most artistic work. Pointing, with pardonable pride, to his long practical association with collotype, he asks, with invincible cogency, "If I can't do the work, who can?" Of the quality of the collotype specimens shown us, it is enough to say that some of them, with their plate marks and India-tinted mounts, might easily be mistaken for photogravures, so close is the resemblance. Specimens of book illustrations and seaside views, which, under their varnish, looked for all the world like exquisite gelatino-chloride prints, were also shown us, all of high technical merit.

Chromo-collotypy, for which unquestionably a great demand exists, will also form a department of the new works. The specimens shown us were suggestive of great success in this branch of work. Carbon and platinotype enlargements, of course, find a place among the productions of the new Company, which also makes a leading feature of its worked-up bromide enlargements, the examples of which that were shown us being of an exceptionally fine engraving-like character. Most charming of all were some portraits in oil and water colours, executed by an artist of obviously very great taste and skill, whose services the Company have been fortunate in securing.

Directed by a man of Mr. Berghoff's ability and enterprise, and embracing so many branches of work in which it is anxious and able to excel, the Richmond Collotype Company should command and retain the success which its many friends, and ourselves in particular, will wish it.

Our Editorial Table.

Photographic and Optical Electric Lamps.

By Rankin Kennedy.

London: H. Alabaster, Gatehouse, & Co., 22, Paternoster-row.

The author of this work has rendered good service to photographers by its publication. It is the first of its nature that has yet been issued. Its object is stated to be to show the various successful lamps and appliances, to describe in simple language the scientific principles upon which they are based, to point out fallacies in regard to their use and abuse, and to give a general idea of the working of each different kind of apparatus. Taking the photographer in hand, and assuming that he is unacquainted with electrical science, Mr. Kennedy explains all the electrical terms, shows the principle on which photo-electric lamps are made, gives drawings and descriptions of nearly every different form, indeed there are no fewer than fifty-nine illustrations in this work of precisely that number of pages. It sells at half-a-crown, and can be strongly recommended, especially to

professional portraitists. The number of electric light studios is increasing, and it is well to be prepared for the more general applications of this powerful and manageable artificial illuminant.

Photo-Keramics.

The Midland Photo-Keramic Co., Tavistock Chambers, Nottingham.

Who that can avail themselves of the services of experienced keramic artists, of which class the above firm is an excellent type, would be at the trouble and expense of burning them in each for himself; some fine examples of the Midland Photo-Keramic Co.'s work sent to us have been scrutinised with great pleasure. One of them, a landscape from a negative by the late Richard Keene, of Derby, is printed in black, but is entirely free from heaviness, or anything approaching to a blocking up of the details, either in the lights or the shadows. Other two are good examples of portraiture in brown tones.

We subjoin a few hints received from the firm as being useful for photographers:—

1. As in every other kind of photo printing, really fine results can only be obtained from good quality negatives. A negative which gives a good silver print will yield an excellent keramic. 2. Solid pictures are best. 3. Where vignettes are required, a really light background is necessary, otherwise the softening off is too abrupt. 4. It is advisable when selecting negatives for either plates or square tiles, to see that the picture will allow of being printed in a circular or square mask. For instance, a full or three-quarter length cabinet can rarely be cut out square to make a picture, whilst an oblong picture on a square tile would appear inartistic. Therefore, for most cabinet photos of this description, the oblong slabs are preferable, although, for plates, a circular mask may be utilised. 5. In all cases original negatives give the best results. If, however, a reversed picture be an objection, a reversed or film negative must be supplied. The best method of obtaining this when taking the photograph is to put the plate with "glass" side towards the lens, having previously cleaned the back of plate. It is advisable to protect the film of the plate with a piece of clean paper. Pictures and engravings (which give magnificent results) should be treated in this manner.

Messrs. Archer & Sons, Liverpool, send a copy of their *Sensible Exposure Note book*. It contains pages for marking 120 exposures.

Received: A sample of the "Spongia" Blotting-paper manufactured by R. Craig & Sons, Caldercruix. It is claimed to be more than usually absorbent.

Picturesque Views of Shrewsbury.

This forms an attractive collection of views of Shrewsbury and its vicinity, with a short *résumé* of objects of interest worthy the notice of photographers visiting Shrewsbury. We have here, from the pen of Mr. W. W. Naunton, a large collection of subjects, briefly tabulated under the respective headings of subjects, situation, hour of the day suitable for exposure, and remarks. We learn that this has been specially prepared for the Convention members, to each one of whom a copy will be presented by the firm of the author—Messrs. Adnitt & Naunton.

The Well-in-Tone Papers.

Wellington & Ward, Elstree, Herts.

Messrs. Wellington & Ward have evidently made a careful study of the varied tastes and styles of photographic printing that prevail just now, and have set themselves the task of catering for them with a thoroughness upon which they are to be congratulated.

First of all, they are supplying a platino-matt-surface bromide paper in four grades, namely, smooth, rough, tinted rough, and special thick, and have given us an opportunity of testing samples of each kind. The emulsion with which the papers are coated yields images of exquisite softness and gradation, with pure blacks that stop short of excessive heaviness, the whites being perfectly pure, and the entire character of the sensitive coating being such as to evince the greatest care and technical skill in its preparation. The special thick paper will be welcomed by those who do not wish to mount their prints, while the "toned" paper, which imparts the effect of an etching to the print, will, we are sure, be very popular among those of artistic proclivities. This paper is a happy inspiration of Messrs. Wellington & Ward.

The developer recommended for the "Well-in-tone" bromide papers is as follows:—

Metol Developer.

Metol	50 grains.
Hydroquinone	15 „
Sulphite of soda	500 „
Potass bromide	10 „
Potass carbonate	200 „
Water	20 ounces.

Dissolve the metol in the water first, then add the other ingredients in the order named.

The same solution may be used for two or more prints in succession.

For producing softer results the hydroquinone may be omitted.

Another production of Messrs. Wellington & Ward's is Sylvio paper. This is a print-out paper, with a highly glazed surface, giving prints of great richness, with freedom from double tones, and rendering the finest details of the negative with faultless exactitude, and with which we are exceedingly pleased. The following is the method of toning recommended:—

After the prints have been washed thoroughly in several changes of water, they should be immersed in the following alum bath for ten minutes:—

Alum	½ ounce.
Water	20 ounces.

After the alum bath, wash thoroughly for several minutes in running water.

Toning Bath.

A.—Sodium acetate	500 grains.
Water	15 ounces.
Gold chloride	15 grains.
B.—Ammonium sulphocyanide	50 grains.
Water	15 ounces.

For use take A two parts, B two parts, water six parts.

As soon as prints are sufficiently toned, transfer them without washing to the following salt bath, which will stop any further toning action:—

Common salt	1 ounce.
Water	20 ounces.

Altogether the additions Messrs. Wellington & Ward have made to our photographic printing resources should ensure great success for their admirable productions.

News and Notes.

The Oxford Photographic Society has ceased to exist, and is replaced by the Oxford Camera Club.

West Surrey Photographic Society.—On Wednesday evening the new room at the Felix Institute, Lavender-hill, will be inaugurated. The programme is: Opening address by P. M. Thornton, Esq., M.P.; judging awards for best pictures taken at the Hampton Court outing; small exhibition of members' work; music.

The rooms of the Royal Photographic Society, at 12, Hanover-square, will be closed from July 20 to August 17 inclusive. Works intended for the Society's fortieth annual Exhibition should be delivered at Hanover-square on or before September 14, or at 5A, Pall Mall East on September 17. Copies of the prospectus and entry form can be obtained from the Assistant Secretary (R. Child Bayley) at the Society's rooms.

The Affiliation of Photographic Societies.—Conference of Secretaries of London Societies, held at No. 12, Hanover-square, on June 26, 1895, Mr. C. H. Oakden (South London Photographic Society) in the chair.—A letter, regretting his inability to attend, was read from Mr. Fenton-Jones. A long discussion took place upon the steps to be taken with a view to prevent the numerous exhibitions held in London clashing so much as they had done in former years, and a course to be pursued with that end was finally decided upon. It having been suggested that most of the London Societies had one or more members who would be willing to give a lecture or demonstration before another affiliated Society in return for a similar service to their own Society, one or two exchanges were arranged for on the spot, and each of the Secretaries present expressed their belief that they had one or more members who would be willing to co-operate. It was proposed by Mr. Panting (Woolwich Photographic Society), seconded by Mr. Everitt (London and Provincial Photographic Association), and carried, that out-of-pocket expenses shall be paid by the Society receiving the demonstration. A discussion took place upon the suggestion that means should be taken to prevent members who gave trouble in the matter of paying their subscriptions or otherwise from being elected as members of other affiliated Societies, and steps were taken to carry out that idea. It was agreed that the Conference should be called together again during the first or second week in September

A NOTE *re* TONING BATH.—We have recently seen it stated that the sulphocyanide bath should be carefully neutralised with chalk, &c.; but, as this is contrary to our own views, we advise that any one who meets with the above recommendation should most carefully ignore it. As we have several times stated, most explicitly, it is quite unnecessary, and *indeed very unwise*, to add anything to the bath. Such additions will inevitably tend to throw down the gold in the bath, and render its toning power absolutely nil. The same authority also suggests that stock toning solutions should be made by adding chalk to the gold and sulphocyanide solution, so as to give a heavy precipitate. Our earnest advice is, "*Don't.*" The only practical way of making up the toning bath is to dissolve the sulphocyanide into a stock solution, 300 grains of the sulphocyanide to ten ounces of water. To prepare the bath, take one ounce of this solution to fifteen ounces of water, and two drachms of the stock gold solution. —*Photographic Scraps.*

THE LEEDS PHOTOGRAPHIC AND PROCESS EXHIBITION.—The Exhibition will open on Monday, September 23, and remain open for about two months. The receiving days are, in Leeds, Wednesday, Thursday, and Friday, September 4, 5, and 6. The Exhibition will be held at the City Art Gallery, Leeds. The Secretary and Curator is Mr. George Birkett, City Art Gallery, Leeds, to whom all communications must be addressed. The following is the schedule of classes:—Section 1, General Photography: In this class any purely photographic printing process may be employed.—Class I., Photographs not having previously gained an award at any open Exhibition; Class II., Photographs which *have* gained an award at any open Exhibition; Class III., Lantern Slides. Special silver and bronze medals are offered for competition by societies for the best series of photographs (not less than twenty in number) illustrative of Yorkshire scenery. The work must be that of members of the exhibiting Society. The individual pictures forming the collective exhibit will *not* be available for competition in any other class. Section 2, Black and White and Monochrome Drawings suitable for reproduction by Photo-mechanical Processes (see separate prospectus, to be had on application). Section 3, Photo-mechanical Processes: In this section the whole of the work strictly appertaining to the production of the block, plate, or any other printing surface (but not necessarily of the negative) must be the work of the exhibitor or of his *employés*, done upon his own premises; work which does not fulfil this condition will be received for exhibition, but not for competition.—Class I., Intaglio work (line and half-tone); Class II., Half-tone work (surface printing), with screen; Class III., Half-tone work (surface printing), without screen; Class IV., Line work (surface printing); Class V., Colour processes of all kinds.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.—Annual Exhibition and Prize Competitions, 1896. Preliminary schedule of prizes. Competitions open to all members.—Open Classes: Class I., Landscape, silver medal; II., Seascape, silver medal; III., *Genre* and Figure Studies, silver medal; IV., Enlargements, silver medal; V., Lantern Slides (six to be entered), prize value 1*l.* 1*s.* Note.—The above classes are open to amateurs and professionals in the United Kingdom, including members of the Society, and the competitions are subject to the Society's Exhibition rules. An entrance fee of 2*s.* will be charged to non-members for each class. Classes for Members only: Class VI., Clouds, silver medal; VII., River Scenery, silver medal; VIII., Home Portraiture, silver medal; IX., Architecture (exterior), silver medal; X., Architecture (interior), silver medal; XI., Landscape (half-plate and smaller), silver medal; XII., Instantaneous (including hand-camera work), silver medal; XIII., Flowers, silver medal; XIV., Lantern Slides (six to be entered), prize value 1*l.* 1*s.*; XV., Three Prints (any subject, any size, open only to members who have never taken a prize, certificates and hon. mention not included), first prize, silver medal; second, bronze. XVI., Photographs not included in above classes, silver medal. Challenge Cup: A silver challenge cup is offered to the exhibitor gaining the highest number of awards in all classes (a first counting three, a second two, and hon. mention one). The winner will hold the cup for one year, and have his name engraved upon it. The cup will finally belong to any member winning it three times. Survey Section: Class XVII., Warwickshire Rural Occupations (including games and industries), prize value 1*l.* 1*s.*; XVIII., Warwickshire Buildings (exterior and interior), prize value 1*l.* 1*s.*; XIX., Warwickshire Buildings (architectural or other interesting details), prize value 1*l.* 1*s.* Pictures in Classes XVII., XVIII., and XIX. must be printed in either platinum, carbon, or bromide, and should be from subjects not previously photographed for the Survey.

THE trip of the Ashton photographers to Shrewsbury, under the leadership of Dr. Hamilton, their President, was remarkably interesting. As a rule those who participate in the outings of the Society are equipped with photographic apparatus, but the President's excursion attracts many ladies and gentlemen who have not yet taken any steps to become acquainted with the art. They go for the pleasure, and are amply repaid. The first thing one of the gentlemen did on arrival was to go into a pastrycook's and order a big consignment of Shrewsbury cakes to be sent home by first train. Perhaps many people's knowledge of Shrewsbury is confined to the celebrity which, like Eccles, it has gained by its cakes, or to its renown in the making of Simnels, which it shares with Bury, and Coventry, and Devizes. The poet Shenstone, who was a Shropshire man, has not overlooked this claim to the gratitude of the gastronomic world possessed by Shrewsbury. He writes:—

> "And here, each season, do those cakes abide,
> Whose honoured names the inventive city own,
> Rendering through Britain's isle Salopia's praises known."

But the place has even more abiding interest than that associated with its cakes. It has been the scene of many momentous historical events in the history of England before and since its old castle was erected by Sir Roger Montgomery, who came over with the Conqueror, and whose son Hugh met his death at the hands of Magnus, a Norwegian king, in a manner which has ever since been cited as an example of the remarkable skill acquired by the use of the bow. The knight was cased in armour from top to toe, and the only vulnerable point was the eye. Two arrows were simultaneously discharged at him. That of Magnus penetrated the eye, and the other dinted the armour at the nose. Shrewsbury boasts fine old Norman abbey church, built by Sir Roger, and in it a tomb is shown which is believed to be his. The place has also several old churches, and Haughmond Abbey, a few miles off, was visited by the photographers. The Severn almost encircles the town, adding enormously to its amenity, and boating on its waters is largely indulged in. The Park, called the Quarry, is noted for its avenues of lime-trees, and two great military heroes, Lord Hill and Lord Clive, are honoured with memorials in the town. For old black-and-white buildings the place rivals Chester in picturesque interest, and its praises were in the mouth of all the photographers. —*Ashton-under-Lyne Reporter.*

DOUBLE PRINTING À LA LAMBERT.—Those who can carry their thoughts back twenty years or so will remember some extraordinary combination carbon enlargements, quite untouched so far as the prints were concerned, that were shown at one of the Exhibitions of the Photographic Society by M. Lambert. The figures, in some instances, were enlarged from paper prints out of groups, and introduced into an entirely different picture. Yet there were no indications that the enlargements were made from paper prints, or that more than one negative had been used in their production. Lambert's method was, for a time, preserved as a secret one to his licensees, but a description of it now may be interesting as well as useful to some. To attempt to give such working details as would meet every subject that at times has to be dealt with would more than fill a number of the *Notes*, therefore I shall confine myself to describing the way to introduce a plain or other background to an enlargement, say a single figure out of a group. It will be quite sufficient to illustrate the principle, which can then be adapted to suit other subjects or conditions. The enlarged negative is produced in the ordinary way. That M. Lambert skilfully retouched, first covering both sides of the negative with mineral paper, and then working on the paper both back and front. In this way the grain of the paper of the original was rendered almost imperceptible. Now, whether the negative be worked up in this way or not, it is necessary that the back of it be covered with mineral paper, secured firmly at the edges. That being done, the procedure is as follows: The outline of the figure, or what is intended to be printed in the first printing, is faintly traced round on the mineral paper with a lead pencil. A piece of thin yellow paper is next laid upon the back of the negative, and the outline roughly traced on that. This is then put on one side for the present. A printing frame with a rather thin gloss—not exceeding a quarter of an inch at most—is now taken and the negative placed in it and pressed accurately in one corner, say the top left-hand one. The tissue is next taken, and, after being cut at right angles on two of its sides, is placed on the negative, it also being pressed accurately in the corner of the frame. The frame is then closed. It will now be seen that the negative and the tissue can be removed at will, and replaced in exactly the same position by merely taking care that they are pressed closely into the corner of the frame. The outline of the figure, for half an inch or so on the background side, is painted round on the glass of the frame with a non-actinic oil colour, such as burnt sienna or Venetian red, the pencil line on the mineral paper serving as the guide. The colour should be kept a little inside of the pencil line, and not directly over it. The yellow paper is next taken, and roughly cut round the tracing, a quarter of an inch or so, both within and without the line, so that about half an inch of the paper is removed. The background portion is now laid on the glass of the frame, to cover up all that is not required outside the paint. The negative is now put to print in a soft, diffused light; strong or direct light must be carefully avoided. When printed, the mask and the still wet paint are removed. Then the outline on the figure side is painted round, keeping this time a little outside the line. The frame is then opened, and the negative removed. Supposing the background is to be a plain or a shaded one, the tissue is replaced in the empty frame (or another negative can be introduced) and pressed closely in the corner. The frame is then closed, and the rough figure paper mask laid on, and the second printing made, the background being shaded while printing according to taste.—E. W. FOXLEE in *Autotype Notes.*

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 12,672.—"An Improved Method of Photo-etching." F. W. J. HENNING.—*Dated July*, 1895.

No. 12,859.—"An Improved Photographic Shutter and Method of Operating the same." C. D. DURNFORD.—*Dated July*, 1895.

No. 12,949.—"Improvements in Lenses for Photographic Purposes." R. STEINHEIL.—*Dated July*, 1895.

No. 13,040.—"Improvements in or relating to the Ornamentation of Picture Frames, Photograph Screens, and similar articles." F. WICH.—*Dated July*, 1895.

No. 13,042.—"Improvements in or relating to Photographic Shutters." R. SCHULTZE.—*Dated July*, 1895.

No. 13,079.—"Improvements in or relating to Photographic Cameras and Shutters." J. B. IRVING.—*Dated July*, 1895.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC HAND CAMERAS.

No. 8070. THOMAS HENRY ALGATE, George-lane South, Plymouth. *March* 23, 1895.

THIS invention, which relates to photographic hand cameras, consists in improvements therein as follows:—According to this invention, the camera is provided with a shutter which is a plate of aluminium, zinc, tin, or other suitable metal, and is hinged to the inner and free end of the reflector, which latter is of the usual kind and is hinged in the camera in the usual manner. Behind the inner end of the lens is a fixed partition having an aperture opposite the lens.

At or about mid-way in the upper edge of the shutter is an aperture extending along the shutter to a given distance on each side of the centre. This aperture may conveniently be termed the exposing slot. A spiral spring attached at one end to the reflector and at the other to the camera frame tends to keep the reflector out of focussing position and the shutter out of exposing position. When it is desired to adjust the focus and make an exposure, the reflector and the shutter are simultaneously drawn down by pulling a cord or the like, so as to overcome the resistance of the spiral spring aforesaid. When lowered, the shutter passes into a recess provided for it. When the reflector, and with it the shutter, have been adjusted, they are set. When released for the purpose of making the exposure, the reflector is returned by the spiral spring to its normal position, carrying the shutter with it at a speed depending on the tension of the spiral spring. In the upward movement of the shutter it passes through a part of a circle and the exposing slot crosses the field of the lens. The result is that the amount of light thrown upon the film increases as the shutter ascends, the narrowest opening being at the commencement of the exposure corresponding to the sky or upper portion of the picture, and the widest at the conclusion which corresponds to the foreground or bottom of the picture.

The reflector is fitted with a hood. If it be desired to use the camera without employing the shutter, the latter is turned on its hinges up behind the reflector, and retained in that position by a suitable catch.

An Improved Electrical Apparatus for Reproducing Images of Distant Objects.

No. 4357. Robert Berglund, 8, Kammakaregatan, Stockholm, Sweden. *March* 30, 1895.

This invention relates to apparatus for reproducing, at one place or station, the image of objects, which are within the range of activity of a transmitting apparatus at another place or station, by the use at the latter place or station of a material sensitive to light in combination with an electric circuit, including a suitable illuminating device at the receiving station, and thus rendering it possible for a person at one station in an electric circuit to view objects at another station in such circuit.

This apparatus is preferably termed a tele-photograph, because it receives the images of the objects at the one station directly, and also directly reproduces these images at the other station.

The transmitting and receiving instruments are alike, with certain exceptions, hereinafter mentioned.

The claims are as follows:—1. An electric apparatus for the purposes above specified, comprising, at the transmitting station, an adjustable objective and a block or point of selenium or analogous material included in an electric circuit, and movable in a spiral line in the image formed at the focus of the objective, and at the receiving station another objective and an incandescent lamp or its equivalent, movable in the same way as the said block or point of selenium or other material, and also included in an electric circuit. 2. In an electric apparatus for the purposes above specified, the combination of the objective, the block or point of selenium or analogous material, or the incandescent lamp or its equivalent, placed at the end of a tube sliding on a rod capable of being turned both vertically and horizontally, a plate mounted on the said tube, and pressed against a stationary collar or surface, a bent lever capable of being turned about the inner end of the said rod, but restrained from sliding longitudinally, a piece of shoe on the outer end of this lever, sliding in a guide on the surface of a conical or other piece or cap, the intermediate shaft of which slides in the main shaft, and moves therewith, and means for communicating to the intermediate shaft a sliding motion from the main shaft, substantially as described.

A New or Improved Method of Preparing Drawings and Photographs for Reproduction.

No. 6687. Ignatius Joseph Rubie and Joseph Edward Mac Manus, both of 49, Lichfield-grove, Church-end, Finchley, Middlesex.—*March* 30, 1895.

Our invention has for its object a new or improved method of preparing drawings and photographs for reproduction by the ordinary and known processes of lithography, photo-lithography, zincography, and other processes of reproduction of drawings and photographs for purposes of book, magazine, newspaper, and other illustrations, whereby a variety of line, grain, texture, tint, and shade is mechanically imparted to the drawing or photograph.

For this purpose we use a plate or series of plates of metal, wood, glass, porcelain, earthenware, xylonite, papier-mâché, or other substance of sufficient hardness and rigidity, upon the upper surface or surfaces of which are engraved, etched, cast, indented, or embossed, or otherwise produced in relief lines, stipples, and hatchings of the character used by engravers and lithographers in the reproduction of pictures, and corresponding to the variety of line, tint, texture, grain, and shade that it is required to reproduce in the reproduction of the drawing or photograph.

The paper or medium upon which the drawing is to be completed, or upon which the photograph is taken, is of such consistency that, when it is laid on the upper surface of one of the plates and rubbed with pencil, or crayon, or other marking substance, the line, or grain, or hatching of the plate is produced on the paper, the marking substance marking only those portions of the paper which correspond to the elevations of the plate beneath, and leaving practically untouched those portions corresponding to the depressions of the plate.

The preparation of the drawings and photographs for reproduction consists in placing the paper or medium, upon which the drawing or photograph is to be made or completed, upon one or several plates in succession, and rubbing or drawing with pencil, crayon, or marking substance, the drawing or photograph in those portions thereof where it is required to produce the character of line hatching or stipple of the plate beneath. Thus, by a suitable alteration of the character of the plate beneath, a variety of tint, texture, shade, grain, and line is given to the drawing or photograph, which is then reproduced by any suitable method.

The claims are:—1. The process of preparing drawings and photographs upon a plate or plates, having roughened or serrated surface or surfaces, for reproduction by lithography, photo-lithography, zincography, or other processes substantially as described. 2. In the preparation of drawings and photographs for reproduction, the use of a plate or a series of plates having its or their surfaces roughened or serrated, the serrations being of tapering sections or provided with inclined, bevelled, or curved upper surfaces substantially as and for the purposes described. 3. In the preparation of drawings and photographs for reproduction as claimed in claim 1, the use of paper having a backing of metal, or equivalent non-elastic material or composition, substantially as and for the purposes described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
15	North Middlesex	
15	Richmond	
15	South London	*The Preparation of Photographic Papers—Collodion and Plain Salted—with a New Formula.* G. H. Moss.
16	Birmingham Photo. Society	Exc.: Ludlow. Leader, T. W. Robinson.
16	Brixton and Clapham	Discussion on Lenses.
16	Gospel Oak	Cresco-fylma Demonstration. C. G. Borrett.
16	Hackney	
16	Hastings and St. Leonards	
16	North London	
16	Paisley	
16	Rochester	
17	Bournemouth	Excursion: Poole Harbour, Sandbanks, and Branksea Island.
17	Bury	
17	Croydon Camera Club	Photographic Chat.
17	Leytonstone	
17	Photographic Club	
17	Southport	*Printing Dodges.* George Cross.
17	Southsea	
18	Glossop Dale	
18	Hull	
18	London and Provincial	
18	Oldham	
18	Oxford Photo. Society	
19	Cardiff	
19	Croydon Microscopical	
19	Holborn	
19	Leamington	
19	Maidstone	
19	North Kent	
20	Croydon Camera Club	Excursion: Tilbury Docks. Leader, The President.
20	Hull	
20	Liverpool Amateur	Excursion: Burton. Leader, F. Anyon.
20	North Middlesex	Excursion: West Drayton.
20	Oldham	Excursion: Hope for Castleton. Leader, James Hall.
20	Putney	Excursion: Epping Forest.
20	South London	Excursion: Tower of London. Leader, G. H. Moss.

PHOTOGRAPHIC CLUB.

July 3,—Mr. L. J. Montefiore in the chair.

Mr. Hare introduced Mr. S. Levy, of Oran, Algeria, Secretary of Le Photo Club Oranais, who offered the use of the Club studio, dark, and drawing rooms to members of the Photographic Club.

Mr. Montefiore asked for information. He wanted black tones on printing-out paper, but could not succeed in getting them. He used the combined bath with lead acetate.

Mr. Wellington said it wanted a good negative. Answering another question, he said he could not say that the lead added permanence to the prints. Answering Mr. Nesbit, he said that a gelatine print would be perfectly fixed in thirty seconds.

Mr. Hodd, mentioning that some makers recommended from one to two hours' washing in running water, elicited from Mr. Wellington the remark that such prolonged washing was not necessary—rather the reverse, an opinion originally given by Mr. Haddon.

Mr. Wellington passed round several specimens of work, amongst them prints from the same negatives on ordinary rough and tinted rough bromide paper. The tinted paper was much approved of by members.

Mr. Haddon made a few remarks upon the usages of gelatine paper with combined baths. He endorsed Mr. Wellington's remark that a short washing in *running* water was all that was necessary. He recommended the use of a second fixing bath.

Mr. Fry gave it as his opinion that, if the papers had a thorough washing before insertion in the combined bath (the same as it would have for a separate toning and fixing bath) degradation of the whites would not result. In practice, he allowed one grain of gold to a sheet for purple, or three-quarters of a grain for warmer tones.

Bournemouth Photographic Society.—A delightful photographic excursion took place on Saturday to Castle Malwood, near Lyndhurst, in the New Forest, the seat of Sir William Harcourt, when a party of members of this Society and their friends took train to Brockenhurst. There a brake was

engaged, and after a pleasant drive of about eight miles, Malwood was reached. There through the kind permission of Sir William Harcourt, the party were allowed to wander through the grounds of the retired and handsome residence. It was on the site of the present building that the castle stood in which William Rufus lodged the night previous to his receiving the fatal dart which deprived him of his life. Cameras were unpacked, and several plates exposed on the half-timbered house, and a good many views in the grounds were secured. It had been anticipated that Sir William Harcourt would have been present, but he had been called away to Derby on election business. After all the plates had been exposed, the party returned to Bournemouth, well pleased with the pleasant afternoon which had been spent.

Oxford Camera Club.—The fortnightly meeting was held on Tuesday in the Geological Lecture-room at the University Museum, Mr. E. A. Ryman-Hall in the chair.—Mr. Wilson wrote from abroad resigning the Hon. Secretaryship, owing to want of time to adequately fulfil the duties. A hearty vote of thanks was unanimously passed to Mr. Wilson for the excellent work he had done for the Club. Mr. V. P. Sells, M.A., was. amidst applause, appointed as Hon. Secretary. Mr. SELLS then proceeded to demonstrate the working of Schölzig's Otto and Presto papers. Commencing with the Presto paper, its great advantage was pointed out in the saving of time possible by exposing the number of subjects for the necessary few minutes, and developing them altogether; also the possibility of enlarging on this paper, two specimens of which of different tones were shown. The Otto paper gave great satisfaction, the variety of tones, coupled with brilliancy, giving promise of its finding many friends. This was the lecturer's first experience of the papers, and, even under many difficulties (the recent drought much interfering with the results), enough was seen of both papers to warrant their large adoption. A vote of thanks to Mr. Sells was awarded. The CHAIRMAN announced the vacation of two months. The fixtures for the competition amongst the members are to be sent to the Hon. Secretary by October 26.

Sheffield Photographic Society.—The monthly meeting was held on Tuesday evening, the 2nd inst., when the President (Mr. Firth) occupied the chair.—After the ordinary business arrangements were made for an excursion to Haddon. Mr. W. T. FURNISS then gave a practical demonstration on bromide paper, the developer used being metol, which he preferred. Sample packets of bromide paper were distributed for trial, and a hearty vote of thanks accorded to Mr. Furniss for his demonstration, which was especially interesting to those who had not tried the process.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

To the EDITOR.

SIR,—Will you allow me to impress on all those members who were at Dublin last year, and who contemplate visiting Shrewsbury this year, to kindly take with them to Shrewsbury any slides that they may have from their Irish negatives?

Messrs. Bridge, Cembrano, and Martin J. Harding form the Committee appointed to select the slides for exhibition on the opening night of the Convention.—I am, yours, &c., R. P. DRAGE, *Hon. Secretary.*

July 8, 1895.

LONDON PARTY TO THE CONVENTION.

To the EDITOR.

SIR,—Mr. Drage is a good soul, but he is artful. In his letter anent reduced railway fares, he certainly does not even suggest that I should organize a party of ten or more, but he is artful, and points out that in previous years I have carried out such arrangements successfully. The result is, that I am being expected to again undertake the matter, and of course it must be so. Last year I failed altogether to get below the ordinary tourist's ticket, although I went to three railway companies and two excursion agents, besides trying other means. I failed to get any reduction for the party, and my own fare was increased by a fraction over seven shillings, out-of-pocket expenses endeavouring to either get reduced fares or to beat the companies. I therefore got the beating.

However, to come to the point, I am organizing a party to leave either Euston or Paddington between 9.30 and 10.15 a.m., on Monday morning, July 15, arriving at Shrewsbury before 3.0 p.m. At present I have Messrs. Haddon, Teape, Mr. and Mrs. Wellington, Cowan, and self, six towards the necessary ten. Will those who can and will join this party kindly send me word. and enclose a remittance for ten shillings, to reach me at 59 and 60, Chancery-lane, W.C., not later than Saturday, 13th inst. For a party of ten and any number above we shall get return tickets at one fare and a quarter. I will also see to special carriages, and will obtain the tickets on Monday morning for those who thus advise me, and for any additional Conventioners who may turn up sufficiently in time to be included. Particulars of exact station and train will be sent by post card.—I am, yours, &c., WALTER D. WELFORD.

A CONTINUOUS TONING BATH.

To the EDITOR.

SIR,—After reading your leaderette on *A Continuous Toning Bath for Gelatine Prints*, and noting your partial failures with phosphate and acetate of soda, I venture to suggest to you the use of our old friend, tungstate of soda. I would be glad if you will experiment with this bath and report to your readers. I have used the tungstate bath for over two years, and find it practically a continuous bath, which may be used from day to day. The bath I am now using has been made for about eight months, is quite purple in colour, and has not been strengthened more than three times with tungstate. It rarely requires filtering, but I am careful to give my prints a thorough washing. I am quite of your opinion that it is better to use distilled water in preparing toning baths. The formula for the bath is—

Tungstate of soda	1 drachm.
Chloride of gold	2 grains.
Distilled water	10 ounces.

Mix and allow to stand for about a week before using.

My mode of using is to take, say, ten ounces of this bath and add to it half a grain of chloride of gold. Toning usually takes place in about three to five minutes, and gives rich colours from brown to purple, or, if the prints are allowed longer time, a purple-black. I rarely find the bath "erratic" and refuse to tone, but now and again have found it so; the addition of a little more gold has always set it a-going.

I ought to say the paper I use is Solio, although I have on a few occasions used Paget.—I am, yours, &c., JNO. ROBSON.

26, *Scotch-street, Carlisle, July* 6, 1895.

[A few prints enclosed by Mr. Robson attest his success with the tungstate bath.—ED.]

A GRUMBLE FROM PARIS.

To the EDITOR.

SIR,—Has it never struck you how easily some manufacturers of photographic materials find some one to defend them if something is found against their products, showing at once that the fault rests with the users, but never with themselves, while at other times their silence is painful to notice? If it is for cardboard, usually the fault is on account of colours, or printing, or starch, even sometimes from the tongue of the operator. The cardboard itself is never to blame. If it is from ready-senistised albumen paper, it is always the fault of the negative (too thin or too intense), or of the toning bath, or, maybe, the fixing. Another variety of reasons is found when blisters show, but the manufacturer is never ot blame. If it is for dry plates which show greasiness, as you found out lately, or different other spots, or why clearing solutions are needed now, and not a few years ago, a very curious silence follows; but, if some amateur asks why he finds uneven developing, at once a defender comes and says that the remedy is a bath tub, or something like it, viz., two full inches deep of solution (for quarter or half-plates), and what more for curling of 12 × 10 plates? fully six inches of developer, probably. Uneven flowing of emulsion by the manufacturer is out of the question, and yet I have found it to be pretty often the case.

To return to cardboard matters, I wrote to you some time ago about my experience with some turning quite yellow, leaving the photograph untouched. As regards paper ready-sensitised (albumen), I can speak at some length, having had a good deal of experience with it. When I complain to the manufacturer, he is always quite astonished, as he never had any complaints of such a nature before, &c.—you probably know that story—but he is generally willing to make some of the loss good. Yet I have never been able to get any one to come and see me print, but I managed somehow to have them admit that something was the trouble, and it was laid on the weather's fault. I printed from one and the same negative several prints, and marked on back good or bad, and sent them to the manufacturer to tone, and the result was exactly as marked, proving that thin or intense negative has very little to do with the result. I can prove this with any negative which is fit to print from. To any one accustomed to use such paper, it is easy to see beforehand the result of the toning. When complaining, the manufacturer never has any negative or printing frame, &c., at hand. It is easy then to just ask him simply for a small piece of paper, and expose it to light, and the result, to the experienced eye, can be followed, and, when you see a peculiar granulation appear, you can show it, and tell him that this piece will never give any good results in the shadows, nor in general appearance. Of course, I do not want to say that the fault always belongs to the manufacturer; but, if it only rests with him once out of ten times, it is quite enough for him to be a little more careful, and not come out with his little item that the users are always at fault, and try and mend, which very often means that he should stay with old formulæ, and not try to improve, which, most of the time, means more profit to him, and consequently poorer material for the purchaser.—I am, yours, &c., A. LEVY.

July 1, 1895.

STEREOSCOPIC PHOTO-MICROGRAPHY.

To the EDITOR.

SIR,—With regard to the paper on this subject, extracted from a contemporary, it is a strange but true fact that photographers evidently

think that they are at liberty to write on any subject connected with photography (and sometimes on subjects that are purely photographic) without having first mastered either the alphabet or the elementary grammar of the topic which they are discussing.

The article in question, one of many scattered through photographic literature, admirably illustrates this. The author of it states that "the principle of the binocular microscope is simple." The explanation given is, briefly, that a perspective or side view of an object is obtained when one-half of the aperture of the objective is stopped out.

Let us for a moment examine what would be the result if such were the case. The author's statement, that any portion of a microscope objective will transmit a picture of the whole object, is perfectly correct, and can at once be experimentally proved; it follows, therefore, that the resultant image in an ordinary monocular microscope is compounded of the various images which pass through the various portions of the area of the aperture of an objective. Consequently, according to the author's view, the resultant image in any microscope is a direct picture of the object obtained through the central portions of the objective, compounded with an oblique view of the same object through the marginal portions of the objective, these two pictures being mixed with less oblique views through intermediate zones of the aperture. In short, the author's theory requires the resultant picture to be a mixture of direct images with those obtained at various angles of obliquity.

Now, suppose a page of THE BRITISH JOURNAL OF PHOTOGRAPHY is held directly in front of one, it will at once be seen that it is of a certain length and breadth, but, if its position be shifted either to the right hand or to the left, an oblique view of it will be obtained; then although its length will appear the same, its breadth will be diminished according to the ordinary rule of perspective, in the ratio of unity to the cosine of the angle of obliquity. By the same rule, if a 100th of an inch micrometer scale be placed under a monocular microscope, the image obtained by an oblique view of the lines through the margin of the objective will be narrower than that of the direct view through its centre. The resultant image ought therefore to be a confused mass of lines, having various widths of interspaces, if the theory propounded in the article in question is correct. Every one knows, however, that the lines would be sharply and correctly depicted, which proves that no oblique view of them is obtained through a microscope objective. Those unacquainted with these elementary facts, which were brought before the microscopical world upwards of ten years ago in an admirable paper by Prof. Abbe, cannot be said to have mastered the A B C of microscopical binocular vision.

The methods of obtaining stereographic pictures, as described by the Author, have been in use since 1853, and were employed for the purpose of photo-micrography by Dr. R. L. Maddox F.R.M.S., many years ago.—I am, yours, &c., A FELLOW OF THE ROYAL MICROSCOPICAL SOCIETY.

To the EDITOR.

SIR,—Forty years ago I described in the *Quarterly Jonrnal of Microscopic Science* a simple method of obtaining binocular or stereographic photographs with the single-tube microscope, by alternately stopping off a portion of the right and left of the object-glass by means of a sliding stop over the back lens. The specimens so obtained were either quite stereoscopic or pseudoscopic as transposed. This method was practically easy, but the difficulty was in the illumination. When artificial light was used, this required to be brought up very close to the substage.

In the practice of micro-photography it is not necessary that a continuous light should be employed. An intermittent one will serve equally well. I therefore, for some objects, made use of the sparks from a common frictional electrical machine. This illuminant as unenclosed is exceedingly rich in actinic rays, and the sparks can be utilised as near the object as desirable without fear of damage from heat. An objection was the labour required to turn the machine. Since the recent introduction of the Wimshurst influence machine this objection no longer applies. My present Wimshurst machine, having a pair of sixteen-inch plates, gives bright sparks between terminals one-quarter inch asunder at the rate of 160 per minute. Of course, if the machine is worked at a distance from the microscope, the wires leading to the terminals should be insulated on pieces of glass.—I am, yours, &c., F. H. WENHAM.

LONG-FOCUS HAND CAMERAS.

To the EDITOR.

SIR,—Our attention has been called to Mr. G. R. Baker's remarks on this subject in your issue of the 5th inst. Mr. Baker is perfectly correct in stating that a good hand camera should be "self-contained, without flaps or projections," besides easily taking lenses of different foci, and he may be interested in knowing that there *are* such cameras in the market, *i.e.*, all the six "N. & G." patterns.

It may interest other of your readers, besides Mr. Baker, to know that we have already modified the pattern B "N. & G." camera in order to be able to use the additional power which the new anastigmat lenses place in the hands of photographers. A hand or tripod camera is, therefore, now obtainable giving foci of four and a half, seven and a quarter, and nine inches, or five and three-quarters, nine, and eleven and a half inches on a quarter-plate by merely using one combination or the other, or the complete lens. The shutter works close to the iris, focussing and diaphragm scales are provided for each lens, and the finders are marked to give the three different angles.—We are, yours, &c., NEWMAN & GUARDIA.

92, *Shaftesbury-avenue, London, W., July* 8, 1895.

YELLOWED PLATINUM PRINTS.

To the EDITOR.

SIR,—In the article *On Things in General* by "Free Lance" in to-day's JOURNAL, Mr. Chapman Jones's paper on yellowed platinum prints is mentioned. The plan I adopt is to have the water for the hydrochloric acid *hot*—I use the cold-bath process, but have the acid water hot, and find the prints are cleared off the iron much quicker and more effectually, and there is less risk of the prints yellowing afterwards.—I am, yours, &c., *Macclesfield, July* 5, 1895. EDWARD WOODWARD.

JANE'S COLOUR PROCESS *VERSUS* E. J. WALL.

To the EDITOR.

SIR,—You and the photographic public will have noticed perhaps how Mr. Wall speaks of my process, contrary to the views of other editors; but, for their further enlightenment, please pay attention to the following items, viz., I have been a constant reader of the *Amateur Photographer* for many years, and, as a courtesy to its editor, I first made him acquainted of my discovery, with my first result as specimen. In his reply, dated April 10, 1895, he expresses his belief of local toning or chemical stainings, and nothing else, and that he could produce exactly the same thing by chemical staining. In reply to this I sent him another result, and asked him to produce a similar by his method of chemical staining. However, he did not do so, but replied that he held the same opinion as before, and returned my specimen, saying he could not state anything different until he knew something more about it. I replied to this by stating I could not tell him more, as my invention was not protected, and, not being a man of means, could not give away my researches. I now again challenge Mr. Wall, through this medium, to produce a like result with chemical or local toning, as he states he can do.

I willingly admit that the specimens at the Agricultural Hall are not perfect, but only marking a possibility. Consider, again, the limited space of time in which they were produced—only a little over two months from the first passable result. Having a ten hours' daily labour to perform under a master leaves me, then, only with very limited amount of time. Again, many of the specimens were produced at night, when, of course, colour values could not be correctly read by artificial light.

I also contend that a person with more artistic ability could do far better work than myself.

Further, and lastly, I will state that I believe of great possibility in the process, and such as will lead to good artistic work.—I am, yours, &c., *Crockwell-street, Bodmin, July* 8, 1895. ARTHUR JANE.

THE PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—In your issue of July 5 is a letter from Mr. Leach, of Carnarvon, in which he expresses his regret that he ever joined the above Society. I may say that the regret is mutual, for of all the troublesome and unreasonable demands made by any photographer, we think it would be impossible to beat Mr. Leach's.

In his first letter he states: "I beg to say a most substantial sum should be sued for, to commence, I think, at least 1000*l*." For copying Mr. Leach's cabinet photograph, and publishing in an almanac.

This will give the measure of sweet reasonableness which we have had to bear in a correspondence of a dozen letters or more.—I am, yours, &c., HENRY GOWER, *Secretary.*

London Chamber of Commerce, Botolph House, Eastcheap, London, E.C., July 10, 1895.

THE LEEDS EXHIBITION.

EXHIBITION OF "BLACK-AND-WHITE" DRAWINGS SUITABLE FOR REPRODUCTION BY PHOTO-MECHANICAL PROCESSES.

To the EDITOR.

SIR,—In connexion with the Photographic and Process Exhibition, Leeds, 1895, the Committee of the City Art Gallery purpose holding an Exhibition on a large scale of works in "black and white" and monochrome suitable for reproduction by photo-mechanical processes.

The Exhibition will open on September 23, and remain open for about two months. Receiving days, Wednesday, Thursday, and Friday, September 4, 5, and 6.

It will include original drawings for book illustration and the like,

ontributed by either the artist or the owner, all of which may be for sale or not, as desired.

Works intended for the Exhibition must be framed, and must be sent in punctually on one of the days fixed for their reception. After these dates no work can be received. The hours for receiving will be from 10 a.m. to 6 p.m.—I am, yours, &c., GEO. BIRKETT, *Curator.*

Leeds, 1895.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.

To the EDITOR.

SIR,—Mr. Avery having resigned the Hon. Secretaryship of this Society, I have been requested to resume the duties pending the appointment of his successor. I shall, therefore, be obliged if all communications respecting this Society are sent to me at our place of meeting, Jubilee House, Hornsey-road, N. Hoping you can find room for this note in your Journal,—I am, yours, &c., GEO. GOSLING,

July 8, 1895. *Hon. Sec. pro tem.*

LEYTONSTONE CAMERA CLUB EXHIBITION.

To the EDITOR.

SIR,—The Annual Exhibition of above Club will be held in the Masonic Hall, High-road, Leytonstone, on November 28, 29, and 30.

Further particulars will be announced in due course.—I am, yours, &c., B. HARWOOD, *Hon. Secretary.*

110, *Windsor-road, Forest-gate, E., July* 9, 1895.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures inpractice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

J. A. KAY.—The address is Thornton Heath, Surrey.

X. Y. Z. (Wilts).—Send us one or two examples, also a sketch of the studio, then we shall be able to advise.

J. AUSTIN.—The blue tissue, such as the marine subjects referred to are printed in, is supplied, we imagine, by various dealers.

A. MCKENZIE.—The trouble is not due to the toning bath, but is with the negatives. They are far too thin to yield bright prints, no matter what toning bath be used.

LENO.—We have heard nothing, for some years now, of a new paper that the Willesden Company were going to introduce for photographic purposes. Why not inquire of the Company?

LENNOX.—So far as we are aware, there are no restrictions in the use of the camera either in Normandy or Brittany. Of course, photographing in the neighbourhood of fortified places is prohibited in all foreign places.

WALLACE BENNETTS.—We have no recollection of the formula. However, Mr. W. K. Burton gives one in his work on *Photographic Printing Processes* (Marion & Co.). There is no work published on the manufacture of carbon tissue.

TONE.—The acetate toning bath is a durable one, but we should not recommend a large quantity of it to be made up in a concentrated form to be diluted as required for use. No bath keeps better than, or perhaps so well as, the acetate one.

B. W.—We strongly suspect you will have to pay the tax. Although the horse and trap may be absolutely necessary in the business to take the large apparatus about, the fact that you also, on Sundays, use it for pleasure will render it liable to the tax.

M. A. W.—Spherical aberration can be introduced in the lens you have, simply by enlarging the aperture of the fixed diaphragm. No other alteration is required. By removing the diaphragm altogether an extremely fuzzy image will be obtained.

S. VOSS.—Various opinions have been expressed as to the suitability of the methylated spirit which contains mineral naphtha for photographic purposes. The differences may be easily accounted for by the fact that the methylated spirit of the oil shops is by no means a definite compound.

W. N. C.—What was recommended is about the best material that can be used for coating wooden vessels that are to contain silver solutions; but you have not used it. You have used paraffin oil instead of paraffin—that is a widely different thing. Paraffin is often called paraffin wax. That is the material to employ.

ALFD. WILLSON.—So far as we know, none of the stock dealers now keep Daguerreotype plates. The only chance, we suspect, of your getting them is from some of the older dealers, who may, by chance, have some left amongst their old stock. Try J. J. Atkinson, Liverpool, or Negretti & Zambra, London. Both houses used to do largely with Daguerreotype material.

E. H. EARL says he "would be much obliged for our opinion of the cause of the spots on the enclosed prints, mounted and kept in a drawer. The mounts have been tested, but not a trace of hypo found in them."—If the spots, of which there are numbers, are not due to the mounts, or the mountant they arise from something in connexion with the manipulations, though what it is is impossible for us to say.

LEX (Yorks).—By removing fifteen feet of the slates in the centre of roof an side of the attic on the north side, and substituting glass, you will obtain an excellent studio. The alteration need not entail any great outlay, though what we cannot say. What we should advise would be to get estimates from one or two local builders. The alteration is not such as will concern the district authorities if it is simply as shown in the sketch.

CONSTANT SUBSCRIBER (Chertsey) asks: "Can you recommend the best way to mount silver prints on memorial cards? I find mounting them in the ordinary way, with starch or thin gum, they cockle up and quite spoil the thin cards. I believe they are to be mounted with a certain cement, which causes them to dry quite flat. Any information on the subject will greatly oblige."—A formula for a mountant that will avoid cockling is given on page 854 of the ALMANAC.

R. S. O.—Your action is certainly not politic. You have done wrong in enlarging the lady's portrait without her permission, and then using it for your own purposes against her wishes and in the face of her protests. We are not surprised that her husband threatens legal proceedings, indeed we should be the more surprised if he does not take them, in which case you may be mulcted in heavy costs. Instead of defying, we should recommend the withdrawal of the portrait and the tendering of an apology to the aggrieved party.

A. BROWN.—It is pretty clear the shutter does not work nearly so fast as the speed you name, otherwise the figures would not show the degree of movement they do in the photographs. It is quite possible that the shutter did work at the speed marked upon it when it left the maker's hands, but it may have met with many retarding influences since—oxidation of the working parts, dust, weakening of the spring, &c. We recently saw a shutter which, when set for the fiftieth of a second, did not open and close the aperture in the tenth of a second.

"A" writes: "Referring to the letter of Mr. A. Ramsden in your issue of June 28, I should like to say that the statement I made was quite correct, and the question was properly put. Mr. Ramsden, perhaps, was not aware that the photographer mentioned the matter to me first in the park, and my question was sent to you before I received the letter from Mr. Ramsden. It was not my intention to sell or exhibit these photographs, but, when the subject was raised, I thought I should like to know what the law really was in such cases. On the afternoon in question, I was (as is known by others in Lockwood) testing a Thornton-Pickard instantaneous shutter, which I had just purchased, so you will see my question was quite in order and correct."

R. E. says: "Last week I was in the country with my hand camera, and came across a party picnicing. It was a pretty group, and I exposed a couple of plates upon it, when a couple of males of the party came up and demanded that I should at once destroy the plates I exposed on the group. This I, of course, refused, when they seized the camera (they evidently knew something about photography), opened, and shot all the plates in it, exposed and unexposed, on to the ground. I was naturally very indignant when they threatened to duck me in the river if I did not clear off at once. A policeman would not interfere; but, surely, I have some redress."—Yes, you have. You can summon the two gentlemen before the magistrates, who may inflict a nominal fine, and probably not allow you costs, considering that you brought the trouble upon yourself by your ungentlemanly conduct.

CONTENTS.

	Page
A NOTE ON LIGHTING	433
AMMONIA AND ITS CARBONATES	434
WASHING GELATINE FILMS IN HOT WEATHER	434
JOTTINGS. By COSMOS	437
MOVING OBJECTS AND PICTORIAL PHOTOGRAPHY. By HENRY W. BENNETT	438
THE PHOTOGRAPHIC NATURALIST. By J. VINCENT ELSDEN	440
A VISIT TO MESSRS. MORGAN & KIDD, RICHMOND	441
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—VII. By T. N. ARMSTRONG	441
NEW PRINTING AND ENLARGING WORKS AT TWICKENHAM	442
OUR EDITORIAL TABLE	442
NEWS AND NOTES	443
RECENT PATENTS	444
MEETINGS OF SOCIETIES	445
CORRESPONDENCE	446
ANSWERS TO CORRESPONDENTS	44

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1837. Vol. XLII.—JULY 19, 1895.

COMBINING BADLY MOUNTED STEREOSCOPIC PICTURES.

It is sometimes the case that, when one examines a binocular picture in the stereoscope, he or she complains of a straining pain in the eyes, arising from the attempt to get the pictures to combine.

This is invariably caused by the mounting of the two elementary parts of the completed slide too far apart. In a properly adjusted stereoscope, scarcely one in a thousand can bring into coalescence a pair of pictures which are mounted three and a half inches apart, measuring from the centres of each, and the attempt to do so is usually attended by the pain alluded to. No really wise stereographer now thinks of mounting his pictures much above two and three-quarter inches apart, for when this distance is not exceeded they are brought into union without any straining to effect their combining.

It is possible, however, to combine the pictures when they are so far apart as to exceed very considerably the proper amount of separation. This is done by having the eyepieces of the stereoscope mounted in such a manner that they can be drawn apart from each other to a greater distance than when they are adjusted for a properly mounted picture. This was adopted in all the stereoscopes made according to Sir David Brewster's directions when he first introduced this instrument. His lenses were each mounted on a small square of wood which moved laterally in a rebate in front of the stereoscope so as to permit of adjustment to the width of the eyes of the observer. Now, in proportion to the separation of the eyepieces, so is it possible to combine pictures which are mounted too wide apart, however undesirable it may be that the necessity for doing so exists.

The mechanical appliances which have been called into requisition since the introduction of the Brewster stereoscope for effecting the separation of the eyepieces have been varied. These comprise, *inter alia*, the double-rack movement, which is not the best for this purpose, on account of the actuating pinion coming nearly between the eyes of the observer; the right and left-threaded screw, the milled head of which projects at one side of the front, and is thus easily operated; the oblique lever, one end of which depends from the centre between the lenses, and a touch of which to one side or the other gives opposing motions to the lenses; and, finally, the geared lenses in the Lothian stereoscope, a description of which will be found in another part of this number.

With a stereoscope having adjustable lenses of either of the methods mentioned, there are scarcely any pictures so badly and widely mounted but what they can be brought into coalescence. The way to do this is to have the eye pieces first at their usual distance apart, and then, looking at the pictures, which will in all probability present a jumbled-up appearance, increase the separation of the eyepieces to the greatest possible extent, if required, until the axes of the eyes are near to the inner margins of the lenses or prisms. Now, when coalescence takes place, and the eyes have well grasped the details, lessen the distance between the two eyepieces, which can then be done without disturbing the definition already obtained. In this way may a binocular picture be seen and examined which, under no circumstances, could be so by the ordinary fixed lenses stereoscope.

But the necessity for having to do all this will be avoided by refraining from mounting the halves of the picture more than two inches and a half, or two inches and five-eighths apart. With a slide thus mounted, pain in the eyes of the observer will be altogether unknown, and the picture will come to the eyes as naturally and expeditiously as will any scene in nature when looked at.

ANOTHER SUCCESSFUL COPYRIGHT ACTION.

A lawsuit of interest to photographers was tried on Friday last in the Queen's Bench Division of the High Court of Justice, before Mr. Justice Charles, in which the plaintiff recovered damages, though not, perhaps, what some might think enough, from one of the illustrated papers for an infringement of the copyright in the photograph of an actress.

There are one or two points in connexion with this case that make it of special interest. One is that the same plaintiff brought an action against the same defendants some months back, in which he was unsuccessful. Another is the novelty of the plea set up by the defence, which was precisely the same as that which obtained for it a verdict on the former occasion, namely that the portraits were taken for a valuable consideration. In this instance, however, the facts were somewhat different from the previous one, and it will be well, in the first place, to point out wherein the two cases differ.

In the autumn of last year, it may be remembered, Mr. Alfred Ellis of Upper Baker-street, brought an action against the printers and publishers of the *Ludgate Monthly* for an infringement of copyright in the portraits of two well-known

actors. These gentlemen sat for their portraits at Mr. Ellis's solicitation, were taken in character, and were presented with copies in due course. But at the time that they sat—and this is important—they had some portraits taken at their request, for copies of which they subsequently paid. It was contended at the trial, by the defendants, that it was these photographs which had been given to them for reproduction, and as they were taken for a valuable consideration—had been paid for—the copyright in them was not vested in the photographer; and that was the view the Court took in the matter. The Judge remarked it was not so much a question of law which he had to decide as one of fact, and the evidence showed that it was the paid-for portraits that had been copied.

In the case tried last week, the circumstances were different. Here, again, Mr. Ellis sued the *Ludgate Monthly* to recover damages, penalties, and for an injunction for the piracy of one of his copyright photographs. The portrait in question is one of Miss Mary Moore, the actress, who sat for it at the invitation of Mr. Ellis, but she paid him nothing, and received a number of "courtesy copies." The plaintiff's case was that he took the photographs for himself, for the purpose of making copies for sale. The defendants, on the other hand, contended that the photograph came within the exemption clause of the Copyright Act, because it was executed for another person, for a good and valuable consideration, the consideration suggested being the right to sell copies, and the advantage conferred upon the plaintiff by the advertisement he gained by the sale. In the result the learned Judge (Mr. Justice Charles) decided that the portrait was not taken for or on behalf of Miss Moore for a valuable consideration. He therefore gave judgment for the plaintiff for an injunction, it being understood that it should not be drawn up. The damages he decided should be purely nominal, and the penalties he assessed at twenty-six pounds, or one farthing per copy. He also gave Mr. Ellis the costs of his action. Execution was, however, suspended with the view to an appeal. The appeal, if it comes off, will be looked forward to with the greatest interest by every professional photographer, because, if it were successful, on the grounds of the alleged "valuable consideration," it would quite upset the copyright in the majority of publication portraits.

It is pretty obvious that a certain portion of the illustrated press quite ignore copyright in photographs, and pirate them through thick and thin, possibly on the ground that photographers are afraid to take action against wealthy firms and companies. It is, however, to the interest of photographers generally that it should be taught otherwise. In the case just referred to it is a little difficult to see why the learned Judge should give only "purely nominal damages," and, in the case of penalties, nominal ones also—a farthing per copy, when the maximum penalty is ten pounds a copy. We are somewhat afraid that the leniency with which this and other cases have been dealt with in the Law Courts will not tend to deter piracy of photographs by the illustrated press. In a recent suit the learned Judge, in charging a jury, told them that the owner of copyright had as much right in it as he had in any of his personal property, but that does not seem to be realised by some of the press.

We are sure that both Mr. Ellis and Mr. Gambier Bolton (who a little time back recovered substantial damages for the piracy of his works) will receive the thanks of photographers at large for the battles they have fought. These they have done without the aid of a Copyright Union or a National Association of Professional Photographers. It requires some "pluck"—particularly after being once beaten, as Mr. Ellis was—to attack wealthy journals, notwithstanding that one may know that justice is on his side, although the quibbles of the law may not always be. All the more honour to those who do.

Sooner or later there must be a new law on copyright, or the present one must be considerably amended, and the different cases which have come before the Courts during the past few years will materially aid in framing an explicit and efficient Act.

Action of Hydrogen on Dry Plates.—Herr Ernest Cohen has been experimenting in this direction by first soaking gelatine plates in a dilute solution of soda, a solution of platinic chloride being added in some instances; then, in the dark, a current of hydrogen gas was directed upon them. In a little less than a day silver was reduced to the blackening of the whole plate. If the platinum salt be omitted, no reduction takes place, though a very small quantity suffices to cause blackening. It is suggested that the action is therefore, in all likelihood, due to the reduction of the platinum salt in the first instance, the reduced metal then reacting with the silver bromide.

A New Balance for Small Quantities.—An ingenious apparatus for weighing small quantities is described by Mr. H. Joshua Phillips, F.I.C., F.C.S., in the *Chemical News*. It consists, in effect, of a thin-stemmed hydrometer, with a special arrangement of guides to keep it from the sides of the jar. An attached needle point is directed against a fine scale. The jar is filled with water, and the zero point noted on the scale, then a definite weight dropped into the pan fixed on the top of the apparatus, and the amount of displacement of the needle point marked on the scale for future reference. Some idea of the delicacy of this very simple and ready method will be obtained, when it is explained that with the instrument employed by Mr. Phillips, which had a stem of a sixteenth of an inch, the displacement with a load of a fifth of a gramme (about three grains) amounted to over three inches. Some such apparatus as this, which is similar in principle to one described in these columns (from an article in *La Nature*) some time ago, should be very useful for weighing pyro for batches of developer, and so forth.

Action of Light on Lead Bromide.—Some year or two ago attention was called to the sensitiveness of this compound to light, and recently, as will be found in a paper by Mr. R. S. Norris in the *American Journal of Science*, the subject is fully treated. The action is much slower than in the case of silver salts, and is entirely superficial. A black specimen of the photographic product, on being dissolved in water with the addition of a drop or two of nitric acid (dry lead bromide does not entirely dissolve in water), left about one per cent. of lead, and analysis showed a loss of two to four per cent. of the bromine. In a second experiment, in which a thin layer of the bromide was exposed to bright sunlight for two weeks, the product was lighter in colour than that which had been exposed for a shorter time, and was entirely soluble in water acidified with nitric acid, the author suggests that the lead had oxidised during the long exposure. Carefully purified lead bromide was found to darken rapidly, whether in the form of crystals or fused, and whether in an atmosphere of hydrogen or oxygen. The author regards the phenomenon as a simple dissociation.

The Usefulness of Paper Pulp.—A very interesting account of the many varied useful purposes to which paper pulp can be put, many of them suggesting useful application in practical photographics. The article states that "paper pulp is one of the most useful articles in the reach of mankind." Mixed with glue and

plaster of Paris or Portland cement, it forms one of the best stoppings for cracks and breaks in wood. When required for use, it is made up with water into the consistency of thin gruel, and the plaster added till a slightly pasty consistency is reached. It must then be used at once. It is excellent for wash bowls where joined to an upper slab. A case is described where, when applied by means of a wrapping of cheese cloth, it sufficed to make good a frost break in an iron pipe. "The strength of this paste when thoroughly hardened is beyond belief. The piece of cheese cloth prevents any clogging of this pipe by reason of bits of the paste working through the crack." Paper pulp boiled for several hours with fine sawdust, mixed with glue dissolved in linseed oil, makes a perfect and homogeneous paste for all sorts of filling in that is likely to be subjected to hard usage.

The Photographic Power of Starlight.—In last week's *Nature* there appears, over the signature of George H. Minchin, an interesting paper upon the electrical measurement of starlight. As we need not explain, the visual brilliancy of stars is described, for purposes of comparison, by a series of magnitudes, No. 1 being the brightest, and so on. Prof. Minchin proposes that these measurements should be made, not by the usual photometer, but by a system of photo-electric measurements of the energies radiated by the particular stars, or, in the case of a series of lights instituted for purposes of comparison, the radiation per unit area at a given distance. A detailed description of this plan is given, and a comparison of the results obtained under it, and a recognised table of magnitudes. Desiring to test the accuracy of his method, he stated that Prof. Boys had been experimenting, with Mr. Watson, of South Kensington, and found that the light of a standard candle at a distance of ·625 of a mile was equal to the light of Arcturus, while by his photo-electrical method the result was ·62. It occurs to us that, as the candle light at that distance would give practically parallel rays, a contrivance for photographing it by an astronomical telescope ought to give very valuable data with regard to star magnitudes and their photographic representation under different durations of exposure.

ENLARGED NEGATIVES.

NOTWITHSTANDING the universal popularity at the present day of snap-shot cameras and small pictures, there are times and conditions when the feeling arises that the quarter-plate fails to do justice to the subject. Under ordinary circumstances, the simplest way out of the difficulty is by enlargement upon gelatino-bromide paper; indeed, if anything larger than 12 × 10 is wanted, this is perhaps the only convenient method of procedure; but, where several prints of the same subject are required, and not larger than the size named, it will often be found a more desirable course to make an enlarged negative, which has the additional advantage of being applicable to any method of printing.

The production of the enlarged negative presents no greater difficulties than an enlarged positive of the same dimensions, although it involves the additional operation of first preparing a transparency from the original negative; but this, in turn, offers further facilities for obtaining perhaps a better result than would be secured on an enlarged direct positive. Not only can the character and gradations of the original be modified to some extent in the intermediate positive, but the latter, as well as the negative, may be utilised for retouching purposes or for the removal of defects, the system of double retouching often proving a valuable assistance in securing the highest class of results.

The preliminary positive may be made by almost any process, though the choice will, in a measure, depend upon the character of the negative to be enlarged. With a negative of ordinary gradation and good quality, the choice ranges between the ordinary dry gelatine plate, wet-collodion or collodion emulsion, gelatino-chloride, either developed or printed out, and, finally, the carbon process; but, where the image is defective in gradation, or is too dense or the reverse, or presents any appreciable departure from normal character, it may be that one or other of the processes named may offer special advantages which adapt it to the individual circumstances.

What is wanted in the transparency in addition to a perfect rendering of the gradations of the subject is a clean and structureless image that will bear enlargement without exhibiting any grain or coarseness, and which, while possessing sufficient density to give a brilliant reproduction, is sufficiently transparent to allow the shadows and half-tones to be correctly rendered. Except with an original of almost faultless character, it can scarcely be said that the ordinary dry plate in every-day use for negative purposes is the best for use, as, independently of a tendency to coarseness of grain, especially in the more rapid kinds, a rigidly accurate exposure is necessary in order to secure the most perfect rendering of the gradation of the subject. Collodion plates, either wet or dry, are free from the tendency to granularity, as are gelatino-chloride films; but all the development methods are alike in requiring accuracy in exposure. On the other hand, where it is desirable to modify in any way the gradations of the original, the development methods will prove eminently suitable as, by, varying the exposure and adjusting the development to the special requirements of the case, alterations in the character of the image may be made that would be impossible with a printing-out method.

Otherwise gelatino-chloride printing-out films would seem to offer the very highest facilities for the delicate and, at the same time, brilliant rendering of almost any class of subject, owing to the beautifully fine state of division in which the silver exists in the films, and the depth and richness, combined with transparency, to which the image can be carried; but, except by artificial masking, or other similar means, there is no chance of altering the gradations of an inharmonious negative, and the use of such plates will therefore be confined to that class of negative which may be termed normal in character, or possess correct gradations.

The carbon process, while it possesses, if properly used, the same advantages as regards delicacy as gelatino-chloride, has the additional good feature that it can be modified to a great extent in its action to suit the requirements of negatives of widely different character. Then, by varying the strength of the sensitising bath, a very wide range of latitude is secured in translating the gradations of the original. If the latter exhibit a tendency to hardness or excessive contrast, a strong sensitising bath tends to counteract it, while, in the case of a soft or flat original, a weak bath leads in the direction of greatest vigour. The age of the tissue, or rather the period that has elapsed between sensitising and use, has also a material effect on the gradation; the newer the tissue, the greater the tendency to contrast, and *vice versâ;* consequently, the softer or thinner the negative, the sooner should the tissue be used after sensitising.

To these features in the behaviour of the tissue itself may be added the fact that, in skilful hands, it is amenable in development to very considerable modifications in both vigour and gradation, even to the extent of local treatment, where portions of the negative are too dense or the reverse. In the case, however, of transparencies for enlargement, it is not advisable to resort to too great an extent to this power, as any slight irregularity or inequality in action resulting from the local application of a stream of water or a soft brush would be rendered glaringly palpable on the enlargement, although possibly it might be comparatively unnoticed before.

The specially prepared transparency tissues are undoubtedly the best for use for this purpose, although, with negatives of ordinary good quality, the regular positive tissues will often give almost equal results. Still, with the latter, owing to the large proportion of gelatine they contain, there is always a tendency, in cases where a heavy shadow cuts sharply against a light, of the thick ridge of gelatine forming an unnaturally hard line in the enlarged image. Besides this, the colouring matter is more finely ground, and is freer from accidental coarse particles in the transparency tissue than in the ordinary, which, if properly worked, gives an image that, for fineness and delicacy, cannot be surpassed, if equalled, by any process extant.

Some short time back I described in these columns the precautions that are desirable in order to ensure the highest degree of excellence in transparency work, and for enlarging purposes especially. These may be briefly recapitulated as follows: The sensitising bath should preferably contain ammonia, and, though the strength will depend upon the character of the negative, it should

e borne in mind that, under the circumstances of the presence of free ammonia, it must be proportionately stronger than if it consisted of bichromate alone. The solution should be very carefully filtered just before use, and the dish covered to prevent the access of dust. The tissue itself should be well dusted or polished with a soft hat brush or a pad of velvet before sensitising, to remove any adhering particles, and should be examined after sensitising to ensure that none have become attached during the process. It is then squeegeed on to collodionised glass, which has been subjected to the same precautions for the avoidance of dust, and allowed to dry on that support. The drying should take place as quickly as possible, without undue hurrying, and should be conducted in a room free from any fumes of burning gas or paraffin. Every precaution should, in fact, be taken to preserve the solubility of the tissue to the utmost, and this will be promoted by allowing the tissue to remain on its support until required for use.

The exposure must be accurately timed by the actinometer; if too short, the result will be harsh; if too long, there will be a tendency to loss of delicacy from forced development. The glass support upon which the transparency is to be developed must be scrupulously clean, and coated with a very thin film of dilute albumen with a little bichromate of potash and ammonia exposed to light after drying and perfectly free from dust. In transferring the exposed tissue to this support, the same care in the avoidance of dust must be observed, and it will be well to make the transfer in a dish of filtered water, the tissue being previously soaked in a separate dish.

The development should be performed at the lowest temperature possible, and without any hurry; a very good plan, especially where more than one picture is to be developed at the same time, is to place them in one of the ordinary metal washing racks, and leave them to take their time, the water being kept as near 110° F. as possible. In this manner the development will take place with the greatest regularity and evenness, and without any risk of loosening of the film or the loss of delicacy.

From transparencies made in this manner, if the original negatives are fairly sharp, enlargements up to three or four diameters may be made that will have definition as good as, or better than, if taken direct.

W. B. Bolton.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

SHREWSBURY MEETING.

Monday.

The Tenth Meeting of the Photographic Convention of the United Kingdom opened at Shrewsbury on Monday last. The weather gave every promise of remaining fine, and this combined with the undoubted picturesque and historical attractions of Shrewsbury and its neighbourhood, augured well for the success of the Convention from a numerical aspect. Of the enjoyability of the Convention week past experience leaves no room for doubt.

By early morning a great many members had already put in an appearance and Mr. R. P. Drage (the Hon. Sec.) assisted by Mr. M. J. Harding (the local Hon. Sec.) and several members of the Shropshire Camera Club, was soon busy "sitting at the receipt of custom" and affording information as to the week's arrangements to anxious members from Dublin, Glasgow, London, Liverpool, Chesterfield, and many other centres.

Mr. A. Haddon is President for the year. The following gentlemen comprise the Local Reception Committee:—

E. Cresswell Peele, Esq. (*Chairman*); the Right Hon. The Earl of Bradford, Lord Lieutenant; E. Wood, Esq., High Sheriff; the Right Worshipful the Mayor of Shrewsbury; the Worshipful the Mayor of Ludlow; the Worshipful the Mayor of Bishop's Castle; His Grace The Duke of Sutherland; the Right Hon. the Earl of Kilmorey; the Right Hon. the Earl of Powis; the Right Hon. Lord Barnard; the Right Hon. Lord Berwick; the Right Hon. Lord Forester; the Right Hon. Lord Harlech; the Right Hon. Lord Kenyon; the Right Hon. Lord Windsor; Viscount Newport; the Right Rev. the Lord Bishop of Lichfield, D.D.; the Right Rev. the Bishop of Shrewsbury, D.D.; The Hon. R. C. Herbert; Major-Gen. the Hon. W. H. Herbert; Sir Wm. M. Honyman, Bart.; Sir Baldwyn Leighton, Bart.; Sir Thos. C. Meyrick, Bart; Sir C. F. Smythe, Bart.; H. D. Greene, Esq., Q.C., M.P.; Stanley Leighton, Esq., M.P., F.S.A.; R. Jasper More, Esq., M.P.; Col. Kenyon Slaney, M.P.; the Very Rev. Canon Allen; Rev. T. Auden, F.S.A.; the Ven. Archdeacon Bather; W. E. Garnett-Botfield, Esq.; W. L. Browne, Esq.; T. P. Blunt, Esq., F.I.C., F.C.S.; W. S. Buddicom, Esq.; E. Burd, Esq., M.D.; A. J. Burr, Esq.; E. Calvert, Esq., LL.D.; C. W. Campbell-Hyslop, Esq.; Jas. Cavan, Esq.; H. C. Clarke, Esq., Town Clerk of Shrewsbury; Rev. Prebendary Corbet; Ed. Corbett, Esq.; Lt.-Col. Cotes; W. Eddowes, Esq.; Rev. Canon G. H. Egerton; T. Slaney Eyton, Esq.; G. Grant, Esq.; J. R. Greatorex, Esq.; Arthur Hince, Esq.; T. M. Howells, Esq.; R. LL. Kenyon, Esq.; Rev. A. G. Kingsford; Rev. J. D. La Touche; T. F. Kynnersley, Esq.; Rev. L. J. Lee; the Ven. Archdeacon Lloyd; G. Butler Lloyd, Esq.; S. K. Mainwaring, Esq.; A. C. McCorquodale, Esq.; Rev. Prebendary Moss; Rev. E. Myers; Rev. T. M. Bulkeley-Owen; John Owen, Esq.; Major Patchett; Rev. A. Thursby-Pelham; Major Heber-Percy; W. Phillips, Esq., F.L.S.; J. E. Severne, Esq.; Arthur Sparrow, Esq., F.S.A.; W. A. Sparrow, Esq.; F. Stanier, Esq.; W. J. S. Barber Starkey, Esq.; W. Thorne, Esq.; C. C. Walker, Esq.; Jas. Watson, Esq.; Lt.-Col. F. A. Wolryche Whitmore; Captain Williams-Freeman; The President and Members of the Shropshire Camera Club.

The local Executive Committee is as follows:—*Chairman:* F. W. Williams, Esq. (President of the Shropshire Camera Club). W. Burson; J. L. Della Porta; Wallace Heath; R. J. Irwin; Jas. Laing; W. G. Preece (Members of the Shropshire Camera Club). *Hon. Treasurer:* W. W. Naunton. *Hon. Secretary:* Martin J. Harding. *Assistant Hon. Secretary:* W. Alltree; and thus early it is apparent that no effort is to be spared by those gentlemen to make the Convention week both successful and enjoyable. During the day many members were busy photographing in various parts of the town, which afford excellent scope for camera work. The Convention headquarters, The George Hotel, are well patronised, the commissariat arrangements necessarily having to be undertaken on a somewhat extensive scale.

The Exhibition.

The large gallery in the Music Hall Buildings, where the meetings are being held, is admirably adapted for the purposes of an Exhibition, being lofty and well lighted. Early on Monday morning the display of pictures was in a commendably forward state of hanging, and before noon was practically completed.

Conspicuous, not only by the sizes and variety of the examples, but by their great beauty, was a series of portrait studies, direct, and enlarged, exhibited by Messrs. Elliott & Son, of Barnet. These comprised Elliottype carbon portraits (touched and untouched), platino-matt bromide paper enlargements, carbon opals, &c., all being of great excellence. One carbon enlargement, the subject being the portrait of a lady, was quite of the remarkable dimensions of nine feet by five, and is an imposing piece of work.

The Eastman Company show some fine contact and enlarged prints on their platino-matt bromide paper, the subject photographed being an old man's head, the face being full of wrinkles and character. Enlargement and contact prints are all on one large sheet of paper.

Mr. James Laing, of Shrewsbury, well sustains local reputation for professional work. He exhibits numerous well-executed and chosen views of the town, and some effective portraits of the last four Mayors of Shrewsbury.

Messrs. Wellington & Ward's exhibit includes examples on the firm's bromide and Sylvio papers, several of Mr. Wellington's well-remembered figure studies being among the collection of prints.

Several specimen prints of golfing subjects, taken on Messrs. Mawson & Swan's plates, are hung, these as well as other subjects shown well attesting the rapidity and excellence of the firm's well-known plates.

The members of the Shropshire Camera Club have combined to get up a collective exhibit which does the photographic taste ability of the Club infinite credit, and shows up the beauty of Salopia to the

best advantage. Mr. A. G. Lawson, Mr. E. C. Lawson, Mr. Wallace Heath, Mr. Della Porta, and Mr. W. W. Naunton are prominent with small work, conspicuous for its combination of artistic delicacy and pure photography. In a separate section for larger work, Mr. W. W. Naunton, Mr. Martin Harding, Mr. F. W. Scott, and Mr. Della Porta have examples of a high order. As this is not a critical review in the ordinary sense, we are not called upon to submit the pictures to detailed notice. Our one and only object is to congratulate the members of the Shropshire Camera Club on altogether a fine show of good work, which should serve as an admirable example and incentive for future Convention-inviting Societies.

The European Blair Company have a display, in charge of Mr. E. H. Hobbs, of the Company's improved special bull's-eye, the Hawkeye, and Columbus cameras, and other items of apparatus.

Messrs. Adnitt & Naunton, of Shrewsbury, in their exhibit, give prominence to views of Shrewsbury (taken by Mr. Naunton), and a selection of hand and stand cameras, including the Frena, Kodaks, and other photographic apparatus appealing to amateur photographers.

A selection of photo-ceramics forms Messrs. Morgan & Kidd's exhibit. These, which were shown to us last week, should, and doubtless will, attract a great deal of attention by reason of their beauty and excellence.

Mr. W. D. Welford also shows a number of photographs sent to the Agricultural Hall Exhibition.

Opening of the Convention.

The formal opening of the Convention took place in the Guildhall, which was filled by a large company of ladies and gentlemen. The Mayor of Shrewsbury (Mr. W. G. Cross) received the members, and having been invited by Mr. E. Creswell Peele (Chairman of the Reception Committee), to welcome the Convention to Shrewsbury, did so in a brief speech which was heartily applauded. He said that though Shrewsbury was small it was picturesque, and the beautiful predominated there. The members might be assured of a hearty welcome. He congratulated the Convention upon its past successes, and concluded by briefly pointing out the great historical and archæological associations of the town, and wishing the members a pleasant time.

Mr. George Mason (Glasgow) thanked the Mayor for the hearty welcome he had extended to the Convention, and he was sure that everybody would enjoy themselves in the quaint and beautiful old town of Shrewsbury. In the absence of Sir Howard Grubb he introduced the new President (Mr. A. Haddon), whom he described as a scientific photographer who did his work well, gave the results of his experiments freely to his brethren, and, in fact, was the right man in the right place. Mr. Haddon then read his annual address as follows:—

PRESIDENT'S ADDRESS.

The position I occupy this evening is a very unenviable one, because I follow Sir Howard Grubb, whose masterly discourse last year on the application of photography to astronomy it would be difficult to equal and impossible to surpass. In that address Sir Howard told you all about the uses to which photography was put in connexion with astronomy, and how it is gradually replacing eye observation. Of all the different purposes to which photography has been applied none can compare with the gigantic scale on which it is being used in astronomy.

My predecessors in the chair have addressed you on all the photographic subjects upon which it is possible to speak: On the lens, the history of photography, the orthochromatising of plates, the art and the commercial sides of photography, and so on—so that of pure photography nothing is left me on which to address you this evening. It would, I am sure, interest only a few if I were to, and could bring before you the advances that have been made in some particular branch of photography. I have therefore preferred to set aside photography pure and simple, and to choose as the subject of my address the advances that have been made in branches of science more or less bordering on our art-science.

I do not intend it to be understood that any one discovery to which I refer is of greater importance than another because the one is dealt with earlier than the other. Any discovery may, when viewed at present, seem of little or no value, but that same fact, in the course of a few years, may be the starting point for some marvellous improvement in directions at present unforeseen. Who, for instance, would have thought, when Faraday first produced that microscopic spark he obtained by tearing the armature, wound with wire from the poles of a powerful magnet, that it would, in a little more than half a century, have developed into the gigantic electric searchlights, of hundreds of thousands candle power, such as we see nowadays.

Aluminium has of late years been used in connexion with photographic apparatus, and is gradually displacing brass and other metals where lightness has to be considered. It is used instead of brass for binding together more rigidly than can be done by means of wood alone the different parts of cameras; it is used for the tops of tripods and for the legs themselves, for lens mounts, and a variety of other purposes. Its great advantage is its lightness, but at the same time, in its unalloyed condition, it has serious drawbacks. It oxidises rapidly, is easily bent, and will not stand a great strain. The use of pure aluminium is, I consider, a mistake, as the specific gravities of some of its alloys are but little greater than that of the pure metal, and we then have the advantage of greater toughness and tensile strength. Mr. Yarrow states, in a paper he recently read before the Institute of Naval Architects on the construction of the aluminium torpedo boat for the French Government, that he found, after a series of experiments, aluminium, associated with six per cent. of copper, to be considerably increased in toughness and tensile strength. This alloy can be doubled over and hammered at the bend without cracking. In a lecture given by Professor Roberts-Austen, at the Royal Institution, an alloy of ninety-eight per cent. of aluminium and two per cent. of titanium was recommended instead of the six per cent. copper aluminium. Titanium, Professor Austin said, ought, and most probably would, if there were a demand for it, be about the same price as tin; its specific gravity is only 5·3, so that it would not materially increase the weight of the alloy as compared with pure aluminium, bulk for bulk.

Brass tarnishes when exposed to the simultaneous action of air and water vapour, but that is usually overcome by lacquering, and there is no reason why aluminium or its alloys should not be similarly treated when the conditions to which it is to be exposed are such as to favour oxidation.

The difficulties involved in working and soldering aluminium will undoubtedly be got over as we gain experience. Whether the alloys work better than pure aluminium or tarnish as rapidly, I am not prepared to say.

A company is about to be formed, or is already in existence, for the manufacture of aluminium on a large scale in Great Britain, and the more extensively it is used the more employment will it give to labour both in Ireland and Scotland. It is proposed to prepare the salts from which the metal is to be extracted from bauxite, which is plentiful in Ireland; then to convey these materials to Scotland, where, taking advantage of the energy stored up in the waterfalls, to drive dynamos, and then, by means of the electric furnace, to reduce the metal from the salts. In this way it is hoped to be able to produce aluminium at about the same price as it can be bought in Germany, where it can now be purchased at the rate of four marks per kilo, *i.e.*, roughly, 2*s.* per pound.

Until recently, most metals were reduced from their oxides by the aid of carbon, which is undoubtedly one of the most energetic reducing agents, in that at a high temperature it combines easily with the oxygen associated with the metal, thus leaving it in the metallic state, and all that is then necessary is to raise the mass to a sufficiently high temperature in order to fuse the whole into the liquid state. But we now know that the reducing power of aluminium is even superior to that of carbon, and many elements which, though plentiful in nature, are scarce in the metallic state in consequence of the difficulty of reduction. Aluminium will reduce chromium to the metallic state from its oxide with comparative ease, and the same is true of the oxides of manganese and several other metals. The temperature at which the aluminium combines with the oxygen and turns out the metal is about 1000° C., *i.e.*, a little above the melting point of silver.

So great is the affinity of aluminium for oxygen at the above temperature, that, in the case of a mixture of granulated aluminium and oxide of lead, the task is such an easy one, that the reduction takes place with explosive violence.

Now that it is so easy to reduce and obtain manganese and chromium in the metallic state and in a state of purity, there is not the least doubt that alloys of these metals with iron will play a very important part in the future. Just as mild steel has practically displaced wrought iron, so these alloys will replace mild steel. Manganese steel is already on the market; it is exceedingly tough, and, where such a property is required in any part of a machine, it is undoubtedly the best material to use. Chromium, when mixed

with iron or steel, gives a very hard alloy. Pure chromium melts at a temperature even higher than that at which platinum does, so most probably the electric furnace will again be required for the preparation of its alloys.

The electric furnace has done good work in the hands of M. Moissan, the designer of the furnace in its present form, for experimental purposes. Its great advantage is the very high temperature that can be obtained in a very small space; nearly the whole of the energy of the electric current is localised and converted into heat. It is estimated that the space around the carbon points in such a furnace reaches a temperature of no less than 3500° C. It is doubtful whether man will ever be able to obtain a much higher temperature than this, as 3500° C. is about the temperature of the carbon of a voltaic arc, and cannot be exceeded in consequence of the passage of the carbon itself into the gaseous form; any tendency to raise the temperature would simply result in a more rapid volatilisation of the carbon, and a cooling would result.

Just as Mr. Cowles and others have used the electric furnace in order to reduce aluminium from certain salts, so Mr. Willson, in North Carolina, tried to obtain metallic calcium by heating in this furnace a mixture of carbon and chalk; but, not obtaining what he expected, he threw the fused mass into a bucket of water. A considerable quantity of gas rose to the surface of the water; the gas, when afterwards examined, was found to be acetylene. Thus accidentally Mr. Willson discovered an easy method of manufacturing calcium carbide, from which, by treatment with water, acetylene can be easily prepared. Till this discovery was made, the preparation of acetylene was a tedious and costly operation, a few cubic feet of acetylene then costing as many pounds sterling as it now costs pence.

Acetylene has undoubtedly a great future before it if properly applied. When burnt at the rate of five cubic feet an hour, it yields a light equivalent to 240 candles, the same volume of ordinary London coal gas yielding only sixteen candles. It will not give, however, when diluted with coal gas or hydrogen, an amount of light in proportion to the acetylene present in the mixture. It is liquefied even more easily than carbon-dioxide, so there ought to be no difficulty in obtaining it in the liquid state. Its actinic value is about two and a half times that of ordinary coal gas, though visually the same.

Passing from one extreme of temperature to the other, our knowledge of the influence of intense cold on different bodies has been considerably extended by the researches of Dr. K. Olszewski, Professor Dewar, and others. At these low temperatures (—200° C.), such as are necessary for the liquefaction of oxygen, nitrogen, air, &c., all ordinary liquids are solidified, and all gases, excepting hydrogen, are converted into liquids. One very remarkable property of almost all solids, at the temperature of boiling air, is that, if exposed to light and then viewed in the dark, they are found to be phosphorescent. Chemical combinations cease to take place, and light fails to darken chloride of silver.

Captain Abney estimates that if the speed of a gelatino-bromide plate, at the ordinary temperature of the air, be taken as 100 at the temperature of boiling air, it is reduced to 25. From this it is supposed that, if we could reach the absolute zero of temperature (—273° C.), the molecules of bromide of silver would be practically dead, and could not, therefore, respond to the vibrations of the luminiferous ether.

Colour photography—by that I mean photographs in natural colours—has not made much progress since the time the brothers Lumière improved the Lippmann process. We shall, however, during this week be brought up to date on this subject, as Mr. Child Bayley has a paper on *Interference-colour Photography*.

Great improvements have undoubtedly been made in process work, due mainly to the use of fish glue and the great perfection with which ruled screens can now be produced. From discussions and papers that have been written on the subject, there is not the least doubt now that the function of the screen is to produce a series of pinhole images of the diaphragm.

Increased interest is being taken in photogravure, and the application of the cross-lined screen to photogravure has considerably facilitated the printing from these plates, so that they can now be manipulated in the steam press, which threatens to be a severe blow to collotype.

Dr. Joly mentioned at the last Convention that he had devised a method of producing transparencies in natural colours. Mr. E. J. Wall, however, will tell you all about this matter, and illustrate the subject on the screen.

It is with pleasure that I read of the attempt that is being made once more to bring burnt-in photographs to the front. Of all the different methods by means of which positives can be produced from our negatives, none can compare with a good enamel. It possesses the advantage of a lantern slide, in that it contains every gradation of light and shade reproduced in the negative. It is superior to all other processes, in that the picture is buried below a fused glaze which is only attacked with difficulty when subjected to the action of water and air. But, then, is it likely that any one who values such a photograph would expose it to such conditions? At times, depending on the composition of the enamel, the glaze seems to tarnish, but that is easily removed, and without the slightest injury to the picture. There is no grain or texture in the enamel, so that the image can be magnified considerably without loss of sharpness.

I cannot understand why photographers, amateurs or professionals, who have a little time to spare occasionally, do not turn their attention to this mode of reproduction, for, if we compare the effect of time on prints by the different processes when paper is used as the support, in every case we find that the support has changed colour, or rather has become coloured. Paper always contains a small quantity of iron, however carefully it may have been made, and it is this iron which is the cause of the yellowing with age. Paper, again, rots after a certain number of years, so that, if we as photographers wish any of the work of the nineteenth century to be handed down to posterity, it can only be done by burying the image below a glaze on glass or enamel. For convenience of working, the glaze should be soft, but for durability it should be as hard as the process adopted will allow. It is only when any subject is studied by a large number of workers that improvements and simplifications are likely to result. It is for this reason, therefore, that I urge all who possibly can to study this method of producing pictures.

Plaques are, when purchased, expensive, but with a little practice it is as easy to produce a plaque as it is anything else. During the experimental stage, any plaque, however imperfect, will do in order to ascertain what colour will result under certain treatment of the film or with certain vitrifiable colours. Thus, while you are learning the influence of certain reagents in modifying the colour or result, you at the same time practise making plaques, you will in a short time be able both to produce suitable pictures and perfect plaques to which to transfer them.

Vitrifiable images can be produced by a variety of methods. We have the dusting-on process, by means of which the bulk of the work at the present time is produced, and to many is the most suitable, as it is easier, and lends itself to such a variety of tones; but it is more troublesome in some respects, as it is so prone to produce spotty images, which spots have to be touched up and the plaque refired. Each refiring naturally entails a risk of damage, due either to cracking of the enamel or specks of metallic oxides fixing themselves in the enamel. This method yields itself very well to after-work when the operator is sufficiently skilled in that direction.

Then the substitution process, which is, to my mind, when properly carried out, the best of all the methods. It is possible by this method to produce images almost perfect, *i.e.*, without blemish and without the necessity of retouching.

I am sorry to have to say that most of the formulæ that have been published on this particular method are absolutely useless; in fact, worse than useless, in that they are misleading. I do not wish to say that the writers have intended to mislead, but certain conditions of the solutions, as to whether they should be neutral, alkaline, or acid, have been omitted, and so, when you come to make up the solutions according to instructions, and use them, nothing but failures result. I may say this not simply because I have failed, but because I know several others who have shared the same fate. One formula which is frequently given in different books for toning with platinum is to take a one grain to the ounce of water of tetrachloride of platinum, and tone the silver image in the collodion with it. If you try it, what is the result? A bleaching of the image, due to the conversion of the metallic silver into chloride of silver, but no deposition of platinum.

This change in colour, a beginner may suppose, is what is required. Let him fire it, and what is the result? A yellow stain and a wasted plaque. Such failures as these, due to imperfect or misleading formulæ, have undoubtedly something to do with the many who have taken up the subject, abandoning it in favour of some less permanent and easier process.

Vitrifiable powder disseminated through gelatine, and made sensitive to light with bichromate, is another process which lends itself to the production of pictures in various colours and of large size. Every vitrifiable colour cannot be used, as some are acted on by the bichromate solution, and, when fired, the resulting colour is very different to what resulted when the powder, pure and simple, was applied to a plaque and fired. This same remark applies, only in a less degree, to the dusting-on process, as there also the vitrifiable powder is brought into contact with bichromate, only in this case the

solution is less concentrated and for a shorter time. The vitrifiable colour itself is of importance, and many of the browns and reds, which consist mainly of oxide of iron, will not stand a very high temperature. The image is also affected in many cases by soaking in acid, and this is necessary, in order to remove the reduced chromium salt, or the resulting image in the high lights will be stained yellow.

Vitrifiable powders mixed with fatty oils, and used instead of ordinary printing ink, when applied to a collotype film ought to yield satisfactory results; but what success has been obtained in this direction I do not know. Paper would most probably be unsuitable as the material for the transfer of the ink from the gelatine to the final support, but, if there were a demand, it would soon be possible to obtain collodion films of sufficient thickness for this purpose.

All kinds of ware can be decorated in this way, and I hope that in the course of a short time, now that a few more photographers have made a start in this direction, we shall see enamels much more frequently than we do.

It is now over forty years since Lafon de Camarsac first gave a short account of his method of producing ceramic enamels; yet, how few people nowadays have seen an enamel, or know how they are produced, or their value!

That vexed question, the determination of the speed of plates, is still unsettled, and will most probably continue so for some time to come. Our authorities on the subject cannot come to an agreement, and we must therefore get on as best we can till the matter has been thoroughly thrashed out by them. One great difficulty in the speed determination will most probably be partly removed by the introduction of the Harcourt-Dibdin pentane standard of light. This light is much more constant than the old standard candle, when temperature, pressure, and hygrometric state of the atmosphere vary. The pentane standard can be used with or without coal gas; if coal gas cannot be obtained, all that is necessary is to force air through the saturator, and you have exactly the same illuminating power as would have resulted had you used coal gas. The enrichment is carried to a certain fixed point, whether it be air or coal gas which is saturated with the vapour of the pentane.

During the last year two new elements have been added to the list. These are Argon and Helium. The first was suspected as far back as 1783 by Cavendish, but its existence in our atmosphere was only recently conclusively proved by Lord Rayleigh and Professor Ramsey. Air contains about 1 per cent. of argon. It is of all elements the most inert, so that it is not likely to prove of much use to photographers. Helium was discovered by Professor Ramsey shortly after argon in a mineral called cleveite. The existence of this element was distinctly shown by a certain line called D_3 in the solar spectrum under certain conditions, but whether this line owed its origin to an element in the sun or in our atmosphere was not known; from the name it would seem that the line was ascribed to an element in the sun. The discovery of this element sets at rest what has been a mystery for some years past.

A short time back it was announced that oxygen is a complex body, but nothing more has been said on this subject lately.

Since the introduction of Jena glass several important improvements have been made in the manufacture of lenses. All these new lenses possess greater flatness of field than their ancestors, and are in many cases absolutely free from astigmatism. We have now wide-angle lenses working with much larger apertures than a few years back. The lens of which we as Englishmen ought to be proud is the Dennis Taylor. This lens is constructed on entirely new lines, and, from what I have heard, possesses all the good qualities claimed for it by its designer.

Standard sizes for lens mounts and flanges are being gradually adopted by opticians. One of the oldest of the leading firms in London has adopted all but one, and it is a great pity that Messrs. Ross & Co. cannot see their way to adopt 1·5 in. instead of 1·52 in., as this one departure spoils the symmetry of the system, and the longer its introduction is postponed the more difficult will it be to make the change.

In conclusion, it is my painful duty to remind you that death has removed, since last Convention, four names from our roll of members.

Mr. Richard Keene, who was elected President by you at the last Convention in Dublin, died on December 13, 1894. By his death we have lost a strong supporter of the Convention and one of our foremost workers.

Mr. Scotton was probably known only to a few of the members, but those who had that pleasure will agree with me that he was a jolly fellow when out picture-hunting.

Mr. Kidd was one of the original members of the Convention, and has been a constant attendant since. He was always genial and full of good fun.

By the death of Mr. Sayce we have lost one of the giants in photography, and his name will live as long as photography is practised as it now is, whether it be for gain or pleasure.

Mr. C. H. Bothamley proposed a vote of thanks to the President for his interesting address, which, he said, had struck out new lines. This, being seconded by Mr. F. W. Williams, was carried amid applause. A vote of thanks to the Mayor for his welcome concluded the formal proceedings; and, in acknowledging it, his Worship humorously reminded the members of the Convention that they had selected St. Swithin's Day for their opening day, but he hoped they would have fine weather.

The Conversazione.

The meeting room in the Music Hall presented a brilliant and animated appearance when, after leaving the Guildhall, the numerous ladies and gentlemen forming the company gathered there. A very large number was present, including Mr. Haddon (President), Mr. and Mrs. G. Mason (Glasgow), Mr. Della Porta (Shrewsbury), Mr. M. J. Harding (Shrewsbury), Mr. A. L. Henderson, Mr. Wallace Heath (Shrewsbury), Mr. C. P. Lucas, Mr. T. L. Lyell, Major Lysaght, Mr. W. W. Naunton (Shrewsbury), Mr. Thomas Mayne (Dublin), Mr. J. Porrit (Leicester), Mr. J. C. Ruthven (Dublin), Mr. and Mrs. Seaman (Chesterfield), Mr. J. Stuart (Glasgow, Mr. A. Tate (Belfast), Mr. E. J. Wall, Mr. and Mrs. Snowden-Ward, Mr. and Mrs. Werner (Dublin), Mr. and Mrs. J. B. B. Wellington, Mr. Thomas Bedding, Mr. John Howson, Mr. J. S. Teape, Mr. R. P. Drage, Miss Drage, Mr. H. P. Robinson, Mr. W. Crooke (Edinburgh), Mr. J. Brown (Newcastle-on-Tyne), Mr. F. W. Hindley, Mr. and Mrs. Percy Lund, Mr. W. D. Welford, Herr Liesegang (Dusseldorf), Mr. T. Fall, Mr. T. Bromwich (Bridgnorth), Mr. A Mowll (Liverpool), Mr. A. Watkins (Hereford), Mr. A. C. Baldwin, Mr. E. H. Hobbs, Mr. L. J. Montefiore, Mr. J. Laing, Mr. Alltree, Mr. W. G. Preece (all of Shrewsbury), and very many others.

A large number of lantern slides, illustrative of places to be visited on the excursions, were then shown, amid great manifestations of pleasure.

Tuesday.

The day broke dull and slightly showery, and continued so more or less till nightfall. Nevertheless, very little disappointment was expressed, remembering that Monday was St. Swithin's Day, and that the Convention is not usually favoured with perfectly dry weather.

It was ascertained that, so far, about 150 members had arrived for the Shrewsbury Convention, and many more were expected.

In the morning a party of nearly a hundred set out for an excursion by road to Buildwas and Wenlock Abbeys, under the leadership of Mr. Della Porta and Mr. Laing. An enjoyable but damp time resulted.

A second party, to the number of about thirty, journeyed to Bridgnorth. A pleasant time was passed in this quaint and curious old town. Mr. J. H. Cooksey, the Town Clerk, kindly piloted the party to the chief places of interest, displaying the ancient Charters and Corporation relics (such as the mace, which Cromwell did *not* have taken away), and afforded the visitors an opportunity of rambling over the old Town Hall. At the luncheon, which was subsequently held, the Mayor (Mr. Beach), Councillor Whitefoot, Mr. T. Bromwich (of Bridgnorth, who with Mr. Lawson "led" the excursion), and Mr. Cooksey, were present, and the Chairman (Mr. Thomas Fall), in the name of the Convention, thanked his Worship (an old wet-plate photographer) for the welcome he had kindly accorded to them.

The Mayor subsequently entertained those present at his private residence, and Councillor Whitefoot also afforded the members an opportunity of descending the Castle Hill Railway from the heights of the town to the river level. This is said to be the steepest railway in England.

Mr. Bromwich took a group of the party, and both he and Mr. Lawson were very attentive to the comfort and enjoyment of the visitors, who departed evidently appreciating the hearty hospitality extended to them by the Bridgnorth magnates.

At the evening meeting Mr. C. H. Bothamley addressed the members on *Some Points Concerning Toning and Fixing*, and there was a display of lantern slides illustrative of places to be visited on the excursions.

Wednesday.

[By Telegraph.]

At the General Committee Meeting, held to-day, it was announced that the finances this year are in a satisfactory condition.

The Convention group, containing nearly 200 members, was taken by Mr. J. Laing, of Shrewsbury.

The Convention next year will be held in Leeds.

PHOTO-MECHANICAL NOTES.

Process blocks, judged by their appearance in print, are too often condemned by reason of faults for which the process worker is in no way to blame, and the process is held up for invidious comparison with wood engraving. It is pointed out how clean and bright woodcuts print, whilst half-tones in the same pages are smudgy. We have seen instances of this kind where there was no reason to impugn the quality of the printing, and, when the blocks bore the imprint of a firm noted for general excellence of their work, the puzzle seemed to be to know who was to blame. The actual author of the trouble will be found in most cases of this kind to be the electrotyper or stereotyper. It used to be pretty generally allowed that a half-tone block was a thing which could not be properly stereotyped or electrotyped, but latterly firms in this line of business, encouraged by the demands of printers, have been less reluctant to try their hands on half-tone blocks. In some cases the results have been very good, but I have never yet seen an electro or stereo duplicate which would render a proof equal to the original, and I have handled a good many. I venture to say, too, that it is always possible for an experienced eye to detect which is the original and which the duplicate when the proofs are placed side by side.

I do not wish to say one word in disparagement of the efforts of electrotypers and stereotypers to duplicate half-tones. Many of their results are admirable; but, when so many others are so bad as to condemn the half-tone process, it is at least just to the latter that the lay public should know where the probable fault lies. It is entirely contrary to the usual methods of the half-tone process to produce smudgy blocks. The whole efforts of photographer, process printer, and etcher are concentrated on keeping the grain of the half-tone block clean and open, and in all houses of good standing the requisite depth for proper printing is well known, and no blocks sent out which do not conform to certain standards in this direction; but it does not follow that a block which will render a good print will allow of a good electro or stereo being taken from it, though this does follow to some extent.

Any one who knows the inside of an average electro and stereo foundry and the routine of work there must be conscious that the conditions are altogether against the production of perfect duplicates of half-tones; the methods are too rough-and-ready, and the plates are handled in a way which a half-tone hand would not dare to do. The method of securing the mould by forcing the plate into a bed of wax by hydraulic pressure is not ideal. It suits well enough for the usual run of woodcuts and line blocks, because there is no great extent of solid masses or close textured work on any part of the block, but let a solid, square, bordered woodcut be put on, or a half-tone, especially if the area of the plate comes anywhere near the size of the bed of the press, the pressure has almost to be raised to breaking strain to get the fine white stipple of the shadows to impress sharp and clear. What is known as a double-page block will not infrequently break or temporarily disable the press. Moulding by hydraulic pressure exemplifies the truism that nature acts along the line of least resistance. As the pressure is applied, the wax is easily squeezed out from the margins, and readily enters the largest hollows and the most open grain of the plate, but where the resistance is greatest, as in the centre of the plate and in the deepest shadows, the wax fails to fully enter and give the necessary cleanness and sharpness. In the majority of plates it is quite impossible to expel the air when the pressure is applied, and the result is that the mould is distorted. The hammering afterwards of the electro plate, face down on an iron slab, to get it straight, is certainly not to the advantage of the delicate details of the half-tone.

If good electro duplicates are required of fine grain half-tone blocks, they ought to be moulded by the method adopted for duplicating steel and copper plates. A mixture of gutta-percha, lard, and Russian tallow is poured on the surface of the plate warm and allowed to set, or a solution of gutta-percha in bisulphide of carbon suits equally well. Lainer, in his *Researches in Photo-xylography*, suggests a composition for the purpose which seems to promise better. It is, in fact, put forth as a complete substitute for guttapercha, and it is certainly much cheaper. The formula is:—

Syrian asphaltum	50	grammes.
Stearin	30	„
White wax	35	„
Spermaceti	80	„
Siberian graphite	20	„

The asphaltum is first melted, and the other ingredients are added in succession as given. The plate to be treated is rubbed with vaseline, using cotton for the purpose, and the mass is poured on hot. When set it can be easily lifted off. The mould is then brushed with Siberian graphite to render it conductive, and is placed in a battery.

Such a method does not come within the every-day routine of an electrotype foundry, but it would be well within the means of any process firm to at least make the mould; in fact, it is not at all difficult nor expensive to construct a Smee battery and depositing trough, which will deposit a sufficiently thick shell of copper over night. The backing and planing would present the greatest difficulty if the jealousy of the electrotypers was against their undertaking it.

At any rate, it is quite certain that, if process workers require good electro duplicates of their half-tone plates, they will have to either make them themselves, or else stimulate some electrotyping firm to make a speciality of this class of work.

I have no faith in stereotyping ever giving a really good result from a half-tone block, though I must admit that some of the results shown by the hard metal stereo process are excellent, and for choice I would prefer this process to any electro by existing methods. The hard metal seems to enter the mould with far greater sharpness, and the surface is not so granular as with the usual soft stereo metal. I have no doubt, too, that much greater care has to be exercised in the preparation of the mould than is customary for the old way.

This matter of duplicating half-tone engravings is really of the utmost importance, if the process is to make a good show alongside woodcuts in illustrated papers, which must of necessity be printed from electro or stereo formes, and printers and process workers should give it their urgent attention.

It may, of course, be suggested, why not make duplicate process blocks from the same negative? The matter of expense and the improbability of getting uniform results are objections. A good half-tone is worth ten times as much intrinsically as a stereo or electro.

In America the electro reproduction of half-tones seems to be much better understood, and most of the photo-engraving firms retail electros of "stock cuts," which are in every way as good as the original. The "stock cuts" must be very helpful to the firms in filling up slack time, and as an additional source of income it must be useful in the face of the cutting competition which exists over there, though it may be presumed that even the "stock cuts" line is overdone too. However, one can commend the enterprise no less than marvel at the audacity with which English and Continental copyright works are produced. If English process workers did the same kind of thing, they would very soon have the predatory copyright lawyer jogging their elbow for fees and penalties.

Turning to the matter of printing half-tones, one must freely admit that a great improvement has been made of late in the way English printers handle half-tone blocks, but there is room for advance yet. The majority of printers do not yet seem to have risen to the fact that there is such a thing as the ink not suiting the paper, or the paper not suiting the ink, and it would save a great deal of trouble if, in ordering their printing ink, they would send to the inkmaker a sample of the paper they prefer to use. Very likely it will be found that the usual rollers will not take this ink. When English printers see that these three important essentials are working in unison, I do not think that half-tone printing on this side will be much behind that of our American neighbours, nor English machine-building appear so much at fault as some people try to make out.

William Gamble.

A SELF-LIGHTING GAS BURNER.

An extremely ingenious device for automatically igniting the gas issuing from a gas burner as soon as the tap is turned on has recently been patented by Mr. J. F. Duke, and, when it is obtainable commercially, is certain to find a place in every photographer's establishment. The principle upon which the invention is based is one with which chemists have been long familiar, viz., the property possessed by finely divided metallic platinum to occlude oxygen and hydrogen within its pores, thus bringing them into such intimate contact that they unite with the production of a flame of small luminosity but great heat. Such was the method employed in the well-known Döbereiner's lamp, and, although the present device would appear to be simplicity itself, we are informed that some years of attention have been devoted to bringing it to its present perfection. The little instrument is constructed as follows:—

A small tube, not so large as an ordinary gas burner, is attached to the burner which it is required to ignite. The upper end of the small tube carries a plug of porous refractory material, upon which a mixture of finely divided metallic platinum and palladium has been deposited. From this plug a fine platinum wire projects as far as the tip of the burner. The action of the arrangement will at once be evident. The gas on issuing from the burner at once spreads out each way, and encounters the plug of platinum black, which is already saturated with oxygen abstracted from the air. Combination between the two gases at once takes place, with the result that the short piece of platinum wire is heated to redness, and ignites the gas escaping from the burner within six seconds of the tap having been opened. The principal difficulty in construction was the obtaining a material upon which to deposit the platinum, and which, while allowing the action of the gases to take place quickly, should yet withstand a fair amount of rough usage. Asbestos was employed without success, but a material has been found (its identity is a secret) which answers perfectly, and, as a test of the efficiency of the apparatus, the inventor mentions that burners having these devices attached to them were kept lighted for months together without detriment to the material or efficiency of the igniter.

THE PHOTOGRAPHIC NATURALIST.*

Considerations of space have compelled me to give nothing but the barest outline of the principles upon which the various types of photo-chronograph are constructed; but there is little doubt that this method of research is destined to have a rapid development in the near future. How the naturalist can avail himself of these elegant discoveries will be abundantly shown in the later sections of this paper. The discovery of the kinetoscope has given fresh importance to the value of chrono-photography in scientific investigation; for, however doubtful might be considered the value of the grotesque effects produced by single instantaneous photographs of moving animals, no one can deny the utility of a series of such views combined so as to reproduce faithfully every detail of animal locomotion. Many interesting problems in animal mechanics promise a ready solution by this means, and every naturalist should study carefully the full descriptions of Marey's method of research.†

Photography of Domestic Animals.—The success which Meissonier achieved in drawing the horse was the result of patient and continuous study of the animal forced day by day to assume the desired position. Such laborious studies are, happily, no longer necessary, for the photographic camera gives a faithful record of the muscular actions brought into play during animal locomotion, with this additional advantage, that it reveals what the eye can never see, owing to the persistence of vision. Although, therefore, an instantaneous photograph of a cantering horse is not artistic, inasmuch as it does not give any feeling of motion, yet, for the purposes of natural history, artistic feeling must often be sacrificed to utility, even at the expense of a grotesque result.

It often happens that domestic animals are best depicted, at rest. In such cases the animal should be made to present as animated a picture as possible, special attention being given to the carriage of ears and tail. The ears of horses should be pricked up, a result generally to be secured by making a *gentle* noise, such as the rustling of a newspaper, or a quiet tapping, out of sight of the animal. All four legs should be visible, the near fore leg being extended forward, and the near hind leg backward. The proportions of animals are best shown in profile. The question of background is of the utmost importance, and, if a suitable tint cannot be secured to contrast with the colour of the animal, it is better to place him against the sky line. It is a mistake to aim at too large a picture, for a smaller one will generally be better exposed, and show better detail for subsequent enlargement.

With regard to domestic pets in the studio, the animal must be made to feel perfectly at ease, a condition not always to be easily obtained. For this reason the open air is to be preferred, for animals invariably carry themselves better when free from the constraint of a strange apartment.

With respect to cattle photography, it is necessary to repeat that a portrait is more to be aimed at than a picture. For scientific purposes every consideration must be sacrificed to obtain both detail and correct proportions. Recumbent positions have their use, however, and instantaneous views, showing the different habits of animals in rising to their feet after rest, have their proper place in natural history.

Photography of Wild Beasts.—The only systematic attempts which have hitherto been made to photograph the wilder animals have been amongst the zoological collections in London and on the Continent. The uncertainty of life of rare species in captivity makes it all the more desirable to secure good photographs while there is yet time. Many species of animals are fast disappearing before the advance of civilisation. The giraffe is becoming rare; the quagga, bison, aurochs, zebra, and hippopotamus are on the verge of extinction, and it behoves every zoological department to have a competent photographer permanently on the spot, and so familiar with the habits of animals as to be able to secure permanent records of their individual peculiarities of life. Snap-shots taken at random with a hand camera are not likely to be of permanent value. Anschütz, one of the chief amongst wild beast photographers, objects to attempt to photograph animals in their cages, on account of the difficulties of lighting, the cramped space, and the objectionable appearance of iron bars either as foreground or background. For this reason he had constructed a properly appointed keep, with artificial background of landscape and painted foliage, into which the animals were turned, and in which he was able to watch his opportunity in safety. Even with these conveniences it was only by the exercise of almost incredible patience that his incomparable results were secured. The present-day photographer would do well to study the early achievements of Frank Haes, by the sole aid of fixed camera, time exposure, and wet plates. Very suggestive, too, are the confessions of the difficulties encountered by successful animal photographers with more modern appliances. Gambier Bolton took fifteen hours to secure his lion photograph, and four days to take the European bison. Photographing in Tring Park, he used 150 plates for the kangaroo, and tried the bloodhound eighty-four times.

If animals in captivity present such difficulties as these, what must be the conditions of animal photography in the field or jungle, where the chance once missed may never occur again. The naturalist's hand camera must be as ready as the sportsman's gun, and his skill, coolness, and patience must exceed that of the hunter in search of his prey.

Bird Photography.—The possibilities of photography have now reached such a pitch that photographs of birds in flight are no longer looked upon as curiosities. The excitement aroused in 1879 over what became known as Gale's swallow was due to a pardonable incredulity that such a result could be achieved with processes then in vogue. Since that time immense strides have been made. Anschütz, in 1884, secured a remarkable series of stork photographs, one of which depicted the parent bird in the act of flying to its nest of young. A short time afterwards Mallin secured his famous gull picture, and now we have more than one work on natural history illustrated by photographs of birds, with their nests, eggs, and young.

As to the question of a suitable apparatus for bird photographs, Dallmeyer's naturalist's camera seems to be well adapted to the case of distant birds at rest, but its weight is somewhat against its convenience for following birds in flight. Marey's photographic gun, specially designed for this purpose, gives twelve images per second on a circular revolving plate, but fails in securing the necessary sharpness and detail which the naturalist very properly looks for in a photograph. Of ordinary hand cameras, the binocular would be extremely convenient were it not for the small size of the image at the distance required for wild-bird photography, for which a tele-photo lens seems to be almost indispensable.

Photography of Fish.—As early as 1856 Pollock obtained successful photographs of pike in an aquarium, and more recently Cohen obtained good results in the Zoological Gardens at Amsterdam by means of the flashlight. He found the chief difficulties were the rapidity of movement of fishes, the loss of light in the water, and the multiple reflections from the glass sides of the tanks. The more

* Concluded from page 441

† See article on Chrono-photographie, *Revue Générale des Sciences pures et appliquées*, t. ii.

elaborate researches of Marey were first accomplished by means of a slowly rotating mirror, which reflected the image on to the plate and produced successive exposures in different parts of the plate, thus producing twelve successive images in juxtaposition. By suitably arranging the illumination, the fish were seen either lit up against a black ground, or as silhouettes against an illuminated ground. Later, the photo-chronograph was employed in the analysis of aquatic locomotion, and interesting comparisons were established between the swimming of fish and the flight of birds.

Attention is drawn to these experiments chiefly for the purpose of reminding the naturalist that, in photography, he has an instrument of proved utility as well as of almost boundless possibility in scientific research.

It may often be desirable to photograph dead fish. It was a photograph of a salmon, taken late in October, showing attached ova, which attracted Frank Buckland's attention in his capacity of Inspector of Fisheries. In such cases the vertical camera will be found of great advantage. The arrangement of this camera may be exactly similar to that described in a former article on *Floral Photography*.*

Anthropological Photography.—The importance of photographing disappearing races of men was insisted upon by Im Thurn in a paper read before the Anthropological Institute in 1893. Unfortunately, uncivilised races have a great fear of the camera. Caribs have been known to fall down and cover their faces as soon as the cap was taken off the lens. These difficulties, however, will be diminished by the use of the hand camera.

In the case of races which have already died out, the anthropologist should lose no opportunity of securing photographs of skulls, with standard scales of measurement attached. The following method has been proposed for this purpose:—Against a black background expose a plate on the scales, drawn in white lines longitudinally and transverse. Then recap the lens, and place the skull in position, so that the visionary scales intersect it. By this method of double exposure, types of race may be secured showing the visionary scales through the body.

J. Vincent Elsden.

A USEFUL VARNISH.

A learned surgeon once said that, if it were possible, for a man following any particular calling or profession, to pick up and remember one "tip" a day, he would, in the course of ten years, become the most learned man in his profession. To the observant photographer it would appear to be a very simple thing to learn one "tip" a day, but he will find that to remember these "tips," so that he can always apply them at the right moment, is a very different thing. It is my intention here to give a few "tips" relating to a certain varnish which is exceedingly useful to the photographer, the excellent qualities of which may not be generally known. To the amateur the varnishing of negatives is always a difficult task, on account of the care and trouble necessary to avoid streaks and irregularities, which show upon the prints. Considerable experience is necessary to so varnish a plate that the surface is perfectly flat and even. Now, the varnish which I wish to praise is one with which this difficulty is overcome with perfect ease, because it is applied to a cold plate, and, as it takes some time to dry, it drains away, leaving a perfectly even surface. The varnish in question is known as crystal varnish, and is composed of celluloid, dissolved in acetate of amyl. It is sold largely in this country by the Anglo-American Varnish Company under the name of white lacquer, and is used extensively for lacquering bright metal surfaces. I have for a long time used this for my negatives, but found so much difficulty (owing to its thickness) in getting it to run over the plate, and, in the length of time it took to dry, that I was on the point of giving it up. Of course it could be made to work by diluting it with acetate of amyl, but this is difficult to obtain, and is, moreover, expensive. I have found, however, that it can be diluted with methylated spirit, care being taken not to add too much. It will stand diluting to double its bulk, but if you go much beyond that you may throw down the celluloid. In this diluted condition it is exceedingly easy to work with, and, moreover, the odour which is so pungent is considerably toned down. It dries in a much less space of time, and flows over the plate quite easily. When a large number of negatives have to be varnished, it is quite easy to so arrange a tin gutter under your drying stand, that the varnish which drains off can run into a bottle. This can again be diluted, and, after having been filtered, it is ready for use again. Celluloid varnish has many advantages over ordinary negative varnish. It is quite unaffected by damp—so much so, that the plates may be placed in water for hours without injuring the film in any way. Should the film become dirty, it can easily be cleaned with a damp piece of cloth. The surface is exceedingly hard, and does not soften when placed in the sun; it is also sufficiently rough to take plenty of retouching without the application of any medium.

This varnish can be applied with advantage to the surface of bromide and carbon opals. Its application admits of their being washed and cleaned without any fear of removing the film; a nail-brush and soap may be used upon them without producing any appreciable effect. It is, again, very useful in the preparation of focussing screens. If a piece of roughly ground glass be coated with this medium, it will be found to have assumed a surface sufficiently fine for any purpose.

In the manufacture of gold paint, for the decoration of frames and mounts, this varnish has no equal. The undiluted varnish, mixed with bronze powder of the desired colour, makes a paint which keeps its colour better and longer than any similar preparation. The bronze paint must always be freshly prepared, as it will not keep, on account of the amount of free acid contained in the acetate of amyl. This acts in time upon the powder, and, in addition to changing its colour, it becomes so thick that it cannot be applied with any degree of regularity.

For protecting any surface from the effects of damp it is most useful, and I have used it with great advantage for coating developing dishes the enamel of which has become cracked.

Iron and steel tools can be kept from rusting by being painted over with it; and lastly, as a varnish for lantern slides, it is unequalled, as it is not injured in the slightest degree by the heat of the lantern. There are a hundred-and-one uses for it which will occur to any one who recognises its properties, and, taking it all in all, I could not recommend a more useful medium in the photographer's workroom than a bottle of celluloid varnish.

Hall-Edwards, L.R.C.P., &c.

* The British Journal of Photography, vol. xlii. p. 42 (January 18, 1895).

NOTES ON HAND-CAMERA WORK.

[The Photographer's Record.]

The Camera.—A considerable amount of misconception exists as to the character of apparatus necessary for this class of work. One thing is certain—the more simple it is, the better, the really important features for a hand camera to possess, being a first-class lens, good large finders, either a magazine or dark slides, a focussing scale, and a reliable shutter.

These are all it needs when intended for use in one's hands for the purposes of pictorial work. Whether the plates are carried in a magazine, or in separate slides, depends on personal taste or the class of work contemplated. Should the camera be required for photographing niggers at the seaside, Punch-and-Judy shows and their admirers, and similar subjects, it may be desirable to have the means of rattling off a dozen plates in as many minutes. On the other hand, separate slides enable few or many plates of one speed or several, ordinary and isochromatic, to be taken out together, and any or all, slow or fast, exposed, as the character or conditions of the subject demand.

The Lens.—For all-round work a rectilinear of five or six inches focus on a quarter-plate will be found to answer best. Some advocate the use of lenses of much longer foci, while other prefer to use them of 3¼ or 4 inches focus. It is better to avoid either extreme.

Finders.—These must be *large* and accurately adjusted to the focal length of the lens, so that one may see *easily* an exact counterpart of what will appear on the sensitive plate.

Shutter.—It is rarely the case that a shorter exposure is required than, say, the tenth part of a second. Indeed, when *pictures* are being sought, oftener than not a quarter of a second would be better. The shutter should be easily adjustable to varying speeds, not too complicated, and so arranged as to allow the maximum of light passing with a minimum of vibration.

Exposure and Development.—The popular idea that only bright, sunny days of summer are suitable for hand-camera work, is a woefully mistaken one. Plates are now obtainable of so high a speed that, in conjunction with a good modern rapid lens, covering at *f*-8, or on occasion *f*-5, there is no period of a year when we are prevented from using our cameras, be they hand or stand; and indeed, for landscape work, late autumn and winter-time are as prolific of subjects, if not more so, than the mid-summer months; and, thanks to the high standard dry-plates have attained of late, a hand camera has now no need to be *on the shelf* at any period of the year.

What is required is a fast plate of good reliable quality, a study made of it under varying conditions of exposure and development until its working has been *thoroughly* mastered, and, when this has been attained, adhering to its use for general work.

In developing this class of negative, where exposures are brief, it is necessary to reduce the pyro (or its equivalent) considerably in the early stages, commencing, say, with one-eighth the normal quantity, adding

the alkali until *such details as we desire to appear* have shown themselves Should the contrasts of the subject-matter be so strong that, even under such conditions of development as those already indicated, they appear likely to become too harsh in the resulting negative, a further addition of water, and a little extra time, will modify matters, and enable the finishing to be done by a few minutes' immersion in a developer *strong* in pyro and bromide, which will cause a transformation from a thin, ghostly image into a negative with such density as may be required for producing harmonious prints. When giving as full exposures as possible, and developing something on the above lines, we abolish soot and chalk from our results, relegating them to their proper spheres—the one to our chimney flues, the other to the billiard-room—there being no more excuse for producing chalky, under-exposed negatives than when using a tripod and giving time exposures. If, from whatever cause, it is found impossible to obtain sufficient exposure, *leave it alone*, and turn to such subjects *as will allow its being given.* W. Thomas.

THE KEEPING QUALITIES OF CELLULOID FILMS.

Mr. C. Mostyn writes in the *Camera Club Journal:* Touching the question of the keeping quality of films, which was mentioned in the discussion on Major Lysaght's paper, perhaps the following may be of interest to some of your readers:—While staying with a friend, and fellow-member, in Dorset, we found in his dark room a packet of the original Eastman "negative paper" cut film, dated, as put up in America, June 4, 1886. We filled a dark slide, and tried two pieces of it; it worked as well as if it had just been sent out. This quite agrees with my own experience, as I always found that old-paper film improves, especially in rapidity, with keeping. But I think nine years, within a few days, is about "record" for age of film, or plate either. No particular care had been taken of it; in fact, its existence was almost forgotten by its owner. I myself am at present using a roll of celluloid film which I bought in October, 1890, and which has been round the world, and twice across the tropics, and in a sailing ship, where the conditions are by no means in favour of keeping quality. But it is working fully as well as rollable transparent film ever does; perhaps that is not saying a great deal. To my mind, it is not nearly as *reliable* as the old (non-stripping) paper, though, of course, much better to print with—the intense desire to curl up into the smallest possible space is an endless source of worry with it, and it seems to be uneven in its sensitivity, having patches of almost insensitive emulsion here and there; but, when it *is* right, it's just lovely. Roll-film *should* keep much better than cut sheets, owing to its tighter packing preserving it from air and damp. I do not see why, other things being equal, emulsion coated on film should not endure quite as well as the same emulsion spread on a glass plate. Celluloid or paper seems to be quite as chemically inert as glass. But, though a "filmist" from their earliest introduction, I am willing to allow that, where weight and fragility are of no moment, the plates do, so far, turn out the best work; but one cannot have everything, and, by a traveller who could only have plates to use, photography would have to be used much more sparingly. As it is, one exposes two or three films on any specially interesting or unrepeatable subject, to make sure; in which case, by the way, they nearly always *all* come right, while things one can only expose *once* upon nearly always go wrong. Perversity of the inorganic creation!

ELECTION PORTRAITURE.

[Daily Telegraph.]

Amid all the anxious uncertainties which surround the General Election, the public, we are glad to find, will be able to reckon with confidence on the realisation of at least one agreeable prospect. Whichever party wins, we are apparently assured of a good-looking House of Commons. This we know on the very best authority—that of the candidates themselves, supported by the evidence of two unbiassed and absolutely incorruptible witnesses—the sun and the photographic camera. At the head of almost every election address now being issued appears a portrait of its interesting author; and in nearly every instance his countenance, we are assured, is etherealised into a dream of beauty, unrecognisable even by his creditors, who, however, it should be remembered, usually see a man at his worst when, as is not always the case, they are able to see him at all. As a description of these pictured aspirants to Parliamentary honours, "etherealised," it seems, is the proper word, for theirs is no charm of mere common place good looks, mere vulgar prettiness, such as might win the prize at a male beauty-show. There is, as we gather, an intellectual, nay, a spiritual attraction, about the presentment of the candidate's features. Eloquence seems to tremble on his sensitive lips, patriotic ardour flashes from his eye, statesmanlike wisdom sits enthroned on his expansive brow. The limbs are not stiff nor the attitude ligneous. On the contrary, the pose is such as the photographic artist of the "plein air" school is accustomed to describe as "heasy," and vainly enjoins upon his bashful and freely criticised sitters on a Bank Holiday In a word, the electoral portrait aims at expressing not only the physical comeliness of the candidate, but the inward graces of his soul. His object is to convince the electors that in returning him they will be providing themselves not only with a representative whose aspect will delight their æsthetic sense, but with one whose nobility of character and genius will still continue to hold them captive after they have exhausted the barren pleasure of the eye; and, since they seem from the accounts given us of their portraits to be all "built that way," we should, perhaps, have been justified at the outset of these remarks in promising the public not only a good-looking House of Commons, but one which will also illustrate the maxim that "handsome is as handsome does."

It is, after all, only a slight modification of the previously existing practice. The election address itself is in the nature of a more or less flattering portrait of the candidate's political views, or, at any rate, of the effect of their adoption. Some years ago this picture took, under the hands of a skilled electioneering artist, a form which would have qualified it for description in a catalogue as *Landscape, with Cattle*—a picturesque country scene, with a rustic figure in the foreground, and just one cow in the middle distance. That slight sketch has been considerably elaborated since, and by 1892 it had expanded into a group of happy villagers dancing round a bonfire, through the flames of which could be descried the charred effigies of the squire and the parson. It had a great success at various exhibitions in the autumn of that year, but it certainly cannot be described as more conspicuously true to nature than the most flatteringly imaginative of the personal portraits which now surmount the statements of political opinions. Indeed, on the principle of the poet that "beauty is truth, truth beauty, that is all ye know on earth, and all ye need to know," the headings of these addresses ought to have a reassuring effect. The results of the photographic process, considered with the eye of Keats, should guarantee the veracity of the letterpress which they introduce. If we could only secure truth in politics by so simple an expedient as that of capturing beauty in the form of a politician's portrait, the world would "go very well then." That, however, is a Utopian wish. We must for the present content ourselves with such fleeting apparitions of the cardinal virtues as the exigencies of party conflict permit the combatants to exhibit. They will not muster strongly enough during the coming conflict to allow of their being drilled for spectacular purposes, as in the old "Moralities." A "Dance of the Seven Deadly Sins" is much more likely, we fear, to be "put up."

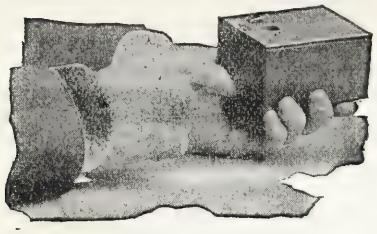
There is, however, another aspect of the electioneering portrait, in which it may interest others besides politicians. Judiciously developed, the system might enable us to dispense with some of the least attractive operations of modern political warfare. If the facial qualifications and general bodily presence of candidates are really of the importance which this new usage appears to imply, might it not be possible to treat them as absolutely decisive of a would-be representative claim? Of course, they may deceive; but so many election addresses, and still more platform speeches, and, as we have already remarked, the most flattering of electioneering portraits can hardly deviate more widely from the truth than the pictures, say, of the revelling agricultural labourer and the loyal and contented Irish Nationalist which have been accepted and admired at three General Elections already. Obviously there is no reason why constituencies should not settle matters by simply looking at the rival portraits, and leaving the speeches and addresses unread. The two candidates might be "hung"—each of them relying, as, indeed, is sometimes the case now, exclusively on a personal canvas—side by side in some convenient public building which would serve at once as picture gallery and polling booth; and the electors, accompanied by their wives and daughters, might then file slowly past them, and after due inspection or the forms and features of each, followed, if necessary, by consultation with their female assessors, mark their ballot papers accordingly. It would certainly save a vast amount of trouble and turmoil, and would quite possibly result in getting together a House of Commons little, if at all, less dignified and efficient than that which, as the French picturesquely put it, "issued from the urns" in 1892. There is no reason to believe that good looks are less to be relied on than political professions. Beauty, it is said, is only skin deep; but opinions do not go nearly so far down as that. Nay, to judge from the effect produced by merely turning the coat, we must conclude that they do not even reach down to the underclothing; and, any how, a little risk of disappointment might well be run by constituencies for the sake of the blessed results of tranquillity. What a holy calm would take the place of the din by which the country will be distracted during the next two or three weeks, if it could only be arranged that the candidates themselves and their supporters should retire from the platform and leave the battle to be fought out by "speaking likenesses" alone!

SEASONABLE NOVELTIES.

The Eastman Company's Pocket Kodak.

Were any proof wanted of the truth of the assertion made by the Eastman Co. that their new Pocket Kodak, which the firm has just

placed upon the market, is not a toy but a useful photographic instrument, it would be supplied, first, by an inspection of a series of charming little pictures that have been produced by it, and secondly, by an examination of the instrument itself, so excellent in design and perfect in construction, although, it is true, it sells at a price (one guinea) much less than some cameras we consider but as toys, and not good toys at that. Its special name is justified by the fact that it can be carried in one's pocket without observation, and, like the revolver of the Western American, it can be instantly taken out, pointed, snapped, and returned to the pocket before the victim realises what has taken place.





The relative dimensions of this instrument compared with the hand by which it is held are shown in the above cut.

A peculiarity of it is found in the fact that the spool of twelve exposures can be inserted in and removed from this little Kodak out in the open fields, the shelter of a dark room not being necessary. When this is to be done, the withdrawal of a catch enables an inner case, made of aluminium, to be drawn out and removed. This reveals a spool of film entirely protected from the light, and which, as stated, can be removed and put away without any danger, and another with unexposed film inserted in its place. This case is then reinserted into the camera, as shown in the illustration. Copious directions for use accompany each Kodak when sent out by the makers.



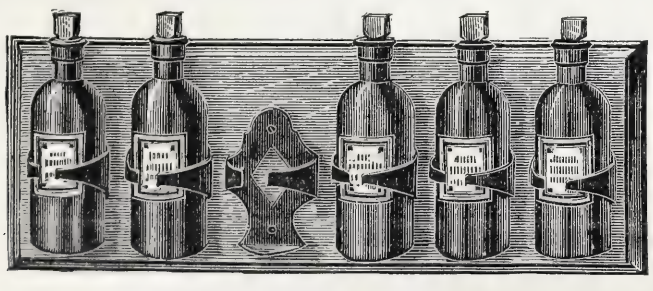
But portraits as well as views can be taken. Our cut shows one of these, given full size. An inspection proves that, if small, it is quite distinct.

"Primus" Bottle Clip and Bottle Rack.

The *raison-d'être* of these clips and racks, brought out by Messrs. W. Butcher & Son, Blackheath, London, S.E., is the superseding of shelves in the photographer's dark room, on board ship, or in the shop, showroom, or office. Their nature is shown so very plainly by the accompanying illustrations as to require no description. The clip can be easily fixed to any wall by nails or screws, and any bottle from 4 ounces to 20 ounces can be held securely instead of being placed on the table or bench, where it is liable to be knocked over in the dark.



A battery of these clips, screwed to a neat substantial board, forms a rack in which a number of bottles serve to hold a sufficient number for every requirement of the developing room.



Many special uses for these clips and racks will at once suggest themselves. They sell at a low price.

The "Lothian" Stereoscope.

Mr. Andrew H. Baird, 37 and 39, Lothian-street, Edinburgh, has introduced a capital form of stereoscope, reference to which is made in our leading article. A good idea of it will be formed by inspecting the cut.



A great objection to the cheap form of stereoscopes on the market is the fixed position of the centres of the lenses. True, many of the better class have these adjustable, but each lens requires to be moved separately so as to arrive at the proper centre. With adjustable centres, many more observers have the power of appreciating the beauty of stereoscopic effect.

Mr. Baird claims for his stereoscope, and this claim is amply borne out, that in his invention the centres of the lenses are adjustable, and that simultaneously; that it is so designed as to admit of the eyes coming close to the lenses; lenses of various foci may be used, and that the whole arrangement takes kindly to the face.

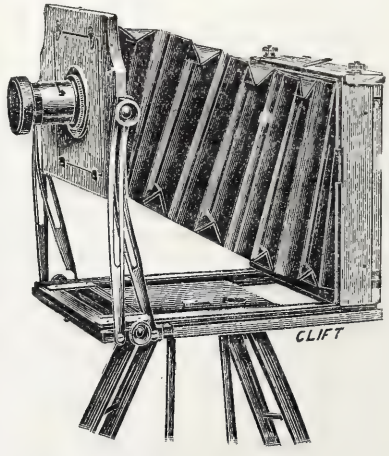
Otto Scholzig's Double Albumenised Paper (14, Binfield-road, Clapham, S.W.).

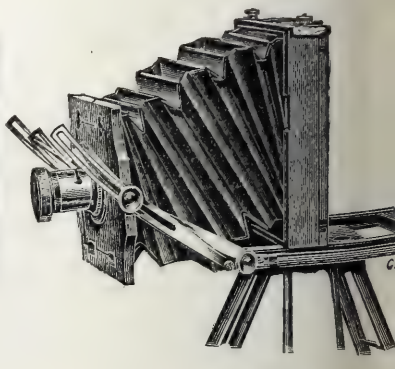
This paper is double albumenised in the true sense of the word. The first coating is made insoluble, which prevents the second coating from sinking into the paper, and causes the image to remain well on the surface, thus ensuring brilliancy. We tried a sample of the paper, and found it to print quickly and tone easily.

Sanderson's Universal Swing Front.

When we were shown the action of this swing front by its inventor, we perceived that it was really a very excellent thing. Its special feature consists in having the front supported on two slotted brass struts at each side, the triangular system being formed by their lower ends being separated a little, and which confers rigidity.

For use, it is simply necessary to place the camera perfectly level on its tripod at a suitable point of view and distance from the object, and, standing behind the camera, with both hands on the screw nuts governing the front, the operator can, by one action, extend the front to focus the picture, and either raise or lower the lens, so as to include as much foreground or sky as desired, the upright lines always remaining perfectly





parallel. It will thus be seen that the swing back, which is, after all, merely a device to rectify the necessity for tilting the camera, is entirely dispensed with.

Messrs. George Houghton & Son, 89, High Holborn, W.C., have secured the sole right to manufacture and grant licences for this invention, which has been secured by patent.

News and Notes.

WESTBOURNE PARK INSTITUTE.—The Fifth Annual Industrial Exhibition of this Institute will take place on September 23, and remain open the four following days. One class is devoted to photography, in which there are five sections.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY.—The exigencies of business having compelled the retirement of Mr. Marchant, so long and favourably associated with the presidency of this body, Mr. J. C. S. Mummery was, on Monday evening, unanimously elected to fill the presidential chair.

PHOTOGRAPHIC SOCIETY FOR STROUD.—A meeting was held on July 11 at the Holy Trinity Parish Rooms, Stroud, to consider the desirability of forming a Photographic Society for Stroud and District. The following resolutions were put and carried:—"That such a Society be formed, to be called The Stroud Photographic Society. That the subscription shall, if possible, not exceed 5*s.* per annum. That professional and amateur photographers, both ladies and gentlemen, in the neighbourhood be invited to become members. That the next meeting be held at the same rooms on Friday, July 26, at 8 p.m." Thomas Hackwood, Hon. Secretary, Newland Villa, Bisley-road, Stroud.

"YOU must carry a light rod and a book of flies, or you won't catch the booking-clerk nodding."—In these terms photographers are publicly advised in one of their own journals to palm themselves off on the railway companies as anglers, and thereby obtain facilities for travelling into rural districts at reduced fares, which would otherwise be denied them. As a mere formality, camera-carriers are recommended to join an angling club, and thereby keep themselves, as it is thought, without the meshes of the law. The fact that detection of the fraud would be difficult, almost to the point of impossibility, in no way minimises the meanness of the device, and one can hardly imagine any self-respecting photographer lending himself to so shameless a piece of imposition. If he be a *bonâ fide* fisherman as well as an expert snap-shotter, well and good; if not, he had better travel less often, and pay the full fare.—*Daily Telegraph.*

PHOTOGRAPHY BY ELECTRIC LIGHT.—Mr. Shapur S. Bhedwar has just made an experiment in photographing a large audience by electric light with results so successful that we are sure they will be appreciated by all lovers of photography in India and by those of the profession in England, who will shortly have an opportunity of judging of them. Mr. Bhedwar chose for the experiment the interior of the Novelty Theatre on the occasion of the recent entertainment to the Hon. Mr. Pherozeshah Mehta. It was a brilliant and effective scene, the audience filling every part of the spacious theatre, and, the camera being placed on the stage, nearly the whole of the interior is brought into the picture. Every face comes out with complete distinctness, and those who know native society in Bombay will recognise many well-known personages in this huge group. The Hon. Mr. Mehta, of course, figures in the centre, garlanded, and with his daughter on his right, and next to her is the late President of the Corporation, Mr. Dharamsi. As this is, so far as we know, the first successful attempt to photograph so large an audience by electric light, some technical details relating to it may be of interest to our photographic readers. The electric installation used consisted of twenty-one arc lamps of 2000 candle power each. The lamps were arranged as below, in order to obtain the very best result from the light. A row of ten lamps was placed at the front of the stage, on the top of the proscenium, while two lamps were placed almost touching the stage, in order to counteract the shadows of the top lamps. In addition to these, on the right-hand side of the dress circle a row of six lamps was arranged, with the highest lamp at the back and the lowest in front. Similarly, in order to counteract the shadows of these lamps, two others were placed on the left-hand side of the dress circle, and one lamp was hung in the centre of the theatre on the extreme top, and the result was the successful lighting now produced in the picture. Some idea of the extent of the lighting may be given by saying that the area of the theatre is about 350 square yards, and has sitting room for 1200 people. The lights were burnt at a voltage of 105, and took up about 100 ampères. The lamps were perfectly steady, and did not flicker in the least. They were lent for the occasion from the Electrical Department of Messrs. Navrojee Wadia & Sons and by Mr. J. N. Tata. The whole of the installation was erected, under the direction of Mr. Bhedwar, by Mr. Jehangir Belli Homjee, a well-known electrician in this city. The rapidity with which the photograph was taken and developed may be gathered from the fact that copies of it, mounted and framed, were presented to the guest of the evening within an hour and a quarter of the plates being taken. There were no trial proofs, and the plate was not touched up in any way, facts which will, we have no doubt, increase the appreciation with which the pictures will be received by the photographic societies in England to whom Mr. Bhedwar is sending copies.—*The Times of India.*

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 13,162.—"Improvements in Objectives for photographic purposes." Complete Specification. C. P. GOERZ and E. VON HÖEGH.—*Dated July*, 1895.

No. 13,203.—"Improvements in and relating to the production of Photographs of Animals." W. I. CHADWICK.—*Dated July*, 1895.

No. 13,377.—"Improvements in the production of Prints by Photography, and in Apparatus for the purpose." W. F. GREENE.—*Dated July*, 1895.

No. 13,400.—"Improvements in Photographic Apparatus." W. E. HICKLING.—*Dated July*, 1895.

No. 13,428.—"A Process and Apparatus for Flattening Mounted Photographs." E. RENARD.—*Dated July*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
22	North Middlesex	
22	Richmond	
23	Birmingham Photo. Society	Exhibition of Pictures taken in Egypt and Syria during a recent Tour, by the President, and Distribution of Prizes and Certificates.
23	Hackney	
23	Paisley	
23	Royal Photographic Society	
24	Croydon Camera Club	Display of Excursion Prints.
24	Leytonstone	
24	Photographic Club	
24	Southport	Hat Night.
25	Glossop Dale	
25	Halifax Photo. Club	
25	Hull	
25	Liverpool Amateur	
25	London and Provincial	
25	Oldham	
26	Cardiff	
26	Croydon Microscopical	
26	Holborn	
26	Maidstone	
26	Swansea	
27	Birmingham Photo. Society	Excursion: Stratford-on-Avon. Leader, E. C. Middleton.
27	Croydon Camera Club	Excursion: Merstham, for Albury Moat and Nutfield. Leader, H. E Holland.
27	Croydon Microscopical	Exc.: Lingfield. Leader, Mr. Wild.
27	Hull	
27	Liverpool Amateur	Exc.: Bidston. Leader, T. F. Lloyd.

PHOTOGRAPHIC CLUB.

JULY 10,—Mr. Wallis in the chair.

Mr. Frank Haes (a trustee) presented to the Club a Daguerreotype apparatus, which he had had the good fortune to have the opportunity of buying. He promised to search still further, and endeavour to find some plates, with a view to give a demonstration before the Club.

The HON. SECRETARY said the best thanks of the members was due to their esteemed trustee for his very valuable gift, and he had the greatest pleasure in proposing a hearty vote of thanks to him. He added that forty-four years ago to-day Daguerre died, so that the present was particularly *apropos.*

Mr. TOTTEM seconded the vote, which was carried with acclamation.

Mr. Foxlee showed a particularly fine coloured Daguerreotype.

Mr. SCRIVENER, an old member of the Club, just returned from the Southern States of America, made a few remarks photographic. He said that a great difficulty they had to contend with was the heat—from 90° to 110°. They had to use ice for everything, and it was as common as mud in the Strand. He said that he should like to see an enterprising plate-manufacturer export some lantern plates ($3\frac{1}{4} \times 3\frac{1}{4}$) to America, for the only plates obtainable were $4\frac{1}{4} \times 3\frac{1}{4}$—not very good and very high in prices—65 cents per dozen. He said that there were still some things that England turned out better than any other country, cameras especially.

Croydon Camera Club.—A crowded gathering of members assembled on Wednesday, July 10, to hear Mr. C. F. Oakley on *A New Anti-halation Plate.* In introducing the lecturer, the President emphasised the widespread harm to photographs caused by halation, and referred to the many attempts which had been made to provide a simple, certain, and inexpensive cure. Mr. Oakley, in his address, sketched the main devices of various later experimentalists which had been applied to the film side of the plate, the most recent of these being the application of a dye to a film between the glass and the sensitised gelatino-bromide surface film. With this otherwise efficient expedient there resulted a staining of the sensitised surface film which greatly impaired its rapidity and regularity of action. The lecturer's invention, known as Thomas's anti-halation plate, comprised an orange-brown film, next the glass, which has the property of not staining or otherwise affecting the silver emulsion subsequently coated over it. The orange film effectually arrests all halation, as was shown by pairs of collotypes of difficult interiors taken, one on an ordinary (unbacked) plate, and the other on the anti-halation plate, the difference being quite startling. In order that the orange stain may become discharged, a slow development is employed averaging ten minutes. Mr. Oakley gave out several, as yet unpublished, formulæ for the development of the above plate, which his latest experiments favour. For interiors, the best and simplest developer is:—Rodinal, 1 drachm; potassium bromide, 10 per cent. solution, 1 drachm; water 5 ounces. Image comes thin, density in high lights follows by given plenty of time. Fix in hypo weaker than normal, using, say, 3 ounces to pint of water. Any other developer may be used, but, if other than rodinal or hydroquinone be employed, the following fixing bath is called for:—Sodium sulphite, ½ ounce; hypo, 3 ounces; citric acid, ½ ounce; chrome alum, 40 grains; water, 1 pint. The above should be followed by an alum bath. Care is to be observed not to finger the surface of the plate, nor should they receive prolonged washing; during the latter operation they should be kept approximately horizontal. The lecturer handed round several ten by eight negatives of notoriously difficult interiors, which are with ordinary plates impossible; thus, whenever *The Angels' Gallery* at Lincoln is attempted, the seraphs have hitherto invariably been absent in the photograph. Mr. Oakley, however, induced them to stay, as his finely rendered print indicated. A plate having been developed and the *modus*

operandi pointed out, a large and exquisite series of lantern slides, made from negatives taken by Mr. Oakley on his plate, were shown on the screen by the Hon. Lanternist, Mr. G. R. White; the subjects were mainly difficult cathedral interiors, including Lincoln, Peterborough, St. Paul's, Westminster Abbey, Christ Church, Oxford, and many others. In the subsequent discussion, Mr. James Packham stated he had found the plates satisfactory and economical. Mr. J. Smith, having tested them, had decided to adopt them for all time exposures. A warmly accorded vote of thanks concluded an unusually interesting lecture. Mr. M. J. Flack was elected a member.

Hackney Photographic Society.—July 9, Mr. R. Beckett presiding.—The Hon. Secretary announced that the Annual Exhibition of the Society had been fixed for November 19, 20, and 21 next. Reports were given of results of the trial of the samples of "Gem" plates. They were found to be good in quality and thickly coated. Members' work was shown by Messrs. Grant, Guest, Gosling, and Hudson. In a discussion *re* vignetting, Mr. GARDNER said he used serrated masks, and kept the printing frame moving by attaching it to a roasting jack. The CHAIRMAN said that a good vignette depended upon the light creeping under the vignettes in diminishing degrees of intensity. It was necessary to keep the frame moving, and a good diffused light must be obtainable. Mr. Westcott showed some new graduated measures, the marking being in white vitrified enamel. Mr. PUTTOCK inquired the best way to spot out pinholes in negatives. In reply, Mr. ROOFE said he used thick red paint. Mr. DEAN said that the colour should be applied at one touch, otherwise the moisture would spread from the brush to the adjacent parts of the film and cause a ring to form, leaving the pinhole as bare as before. The CHAIRMAN concurred, and said that water colour should be used, and the spot should be made about the same density as the surrounding parts; if made too opaque, the print would have to be spotted afterwards. It was decided to hold a sale and exchange night for members on August 27.

North Middlesex Photographic Society.—July 8,—Mr. FRANCIS L. PITHER, in opening a discussion on *Holiday Resorts*, thought that, for a holiday to be of lasting good, it should consist of an entire change—not only change of locality, but change of scenery, characteristics, manners, customs, tongue, so that he strongly advocated holidays abroad, and particularly the Belgian Ardennes or Holland. Speaking as to the question of expense, he instanced one holiday he had through Honfleur, Pont-l'Evêque, Caen, Bayeux, &c., over country extending approximately as far as from London to Newcastle, which, for twelve days, had cost 6*l.* 10*s.* He strongly recommended a trip *vid* Harwich to Antwerp, from there to Dinant, which was the heart of what is called the "Rhine scenery of Belgium," and then explore the river Meuse, the points of interest on which are endless. He mentioned that the light over there would be found to be very much stronger than in England, and exposures should be regulated accordingly. Mr. H. SMITH did not agree with Mr. Pither. He thought healthful holidays, beautiful pictures, and change of air and scenery could be got just as well inside the borders of our island as abroad, and the preliminary trouble of learning another tongue would be avoided. He was exceedingly fond of such places as Deadham, the Broads of Norfolk and Suffolk; also Devonshire and Cornwall, with their lovely scenery, and he had resolved that, until he had exhausted the beauties of our own land, he should not trouble to go abroad. Mr. R. CHILD BAYLEY strongly supported Mr. Pither's view. He quoted the opinion of the doctor "out West," who, as recorded by Bill Nye, recommended his patient "change of scene and rest," and then, with his six-shooter, sent them to enjoy the rarified air of the New Jerusalem. He did not recommend that particular method of change, but he strongly recommended a trip to Belgium, or some other Continental place. As to the difficulty of language, he stated that a little guide published by Bradshaw gave such simple and convenient sentences and dialogues that he himself, in countries where he had no knowledge of the language spoken, had no difficulty not only in making his wants known, but in carrying on a conversation in, well, totally unnecessary topics. Mr. GOLDING thought Mr. Smith's view the right one. Why go to Holland when Norfolk and Suffolk gave as much flat country, reedy waterways, and skies as one would wish for, and, as to the grand scenery that was spoken of, he had generally found it to be non-photographic, as success in photography depended more on the careful selection of small views than the exposing of plates on large scenes, which generally were more topographic than pictorial? The discussion was continued by several other members, and, in the result, probably everybody ended with the opinion with which he started, and, after all, would not care to give up his own favourite beauty-spots. The competition of Guilford pictures resulted in Mr. Marchant being placed first and Mr. H. Walker second.

Birmingham Photographic Society.—At a General Meeting, held in the Club room on July 9, Mr. F. W. Robinson in the chair, it was found necessary, on account of the General Election, to postpone the excursion to Ludlow, which had been advertised to take place on Tuesday, the 16th, until Wednesday, the 17th. Mr. HAROLD BAKER gave an interesting address and demonstration on *Printing with Collodio-chloride Paper*. The process was an old one; but, whereas in former times it was necessary to prepare the paper at home, now it is a marketable article. The lecturer believed the process to be one of great permanency, and handed round a number of prints, which had been exposed to extreme variations of temperature and light, in a show-case for three months. No other paper would stand such a test, not excepting platinotype. He claimed many advantages for the process: its adaptability for printing with strong negatives, such are suitable for carbon or platinotype; the small amount of gold required in toning (about one-sixth of the amount necessary for P.O.P.); fewer mechanical defects than any other paper; the paper could be dried between sheets of blotting-paper, and would be mounted whilst wet; the great ease with which it can be spotted. Blistering in hot weather is undoubtedly due to variations in the temperature of the various baths used, and can hence be avoided. The cracking of the film can be avoided in the first place by purchasing the paper in flat sheets, and by washing the prints face downwards. Mr. Baker toned some prints in a sulphocyanide bath that had been in use for twelve months, fresh gold and sulphocyanide being added as required, the bath being filtered after use. The resulting tones were quite satisfactory. Some matt-surface paper was toned in a bath containing a mixture of gold and platinum. Warm tones could be obtained by using a simple combined bath, which consists of a solution of hypo of the ordinary strength. This is neutralised with bicarbonate of soda, and a few grains of gold added. The toning in this instance is slow, and he would not like to answer for the permanency of the prints, although he saw no reason why they should differ from those toned in a separate bath. The prints which Mr. Harold Barker passed round to illustrate his remarks were much admired. A discussion followed, in which Messrs. Robinson, Hall-Edwards, Underwood, Baynton, C. J. Fowler, and others took part. A vote of thanks was given to Mr. Harold Baker for his interesting address.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

GELATINO-CHLORIDE PAPER.

To the EDITOR.

SIR,—I have read with much interest Mr. Maclean's article on *A Promising Printing Process*, and the letters which have followed the remarks of "Cosmos."

As a worker of gelatino-chloride for nearly two years, I agree with all that Mr. Maclean has said, and I am sorry to say my faith in its permanency and other reputed good qualities is considerably shaken, and I contemplate going back to albumen unless something better is introduced. All honour to those workers who are trying to advance photography—and gelatino-chloride was looked upon as a distinct advance—but, after a fair trial, what do we find? that the few possible advantages are more than counterbalanced by its disadvantages, and many photographers are, like myself, giving up its use and seeking for something better. My father is an old photographer, and he compares with pride some of his prints made on albumenised paper many years ago with the yellow, rat-red, double toned productions of gelatino-chloride. His advice to me was, Don't, my son, be running after every new-fangled idea, test it first. I have tested gelatino-chloride, and found it wanting. One great advantage will come out of these trials, and that is, photographers and the public will become so tired of poor discoloured prints that a greater demand will arise for the more permanent productions of carbon and platinum. Some of us who live so far away from the great centres are dependent upon THE BRITISH JOURNAL OF PHOTOGRAPHY for our information, and, not having the opportunity to see some of the finest work by all the processes, necessarily look to you, Mr. Editor, for guidance, and for years I have not been disappointed. "Cosmos" often says some good things, but don't let any personalities or *interested motives* be introduced, discuss the merits of this, that, and the other "paper," good will come out of it, and thanks will be given by—Yours, &c., A PHOTOGRAPHER'S SON.

COLLODIO-CHLORIDE PAPER.

To the EDITOR.

SIR,—The discussion which has been going on in your columns *re* the respective merits of collodio-chloride and gelatino-chloride printing papers has been interesting, but there are several points which have not been noted by your correspondents.

1. The extreme difficulty of getting a large batch of collodio-chloride prints finished intact. You may get fine tones, but the very large percentage of prints ruined by chips, small cracks, and other mechanical faults makes the process very costly.

2. When a print is finished and mounted the film is still extremely delicate. I have seen a print ruined by merely sliding it into an ordinary frame. The friction caused by opening and closing an album will, in a very short time, wear away parts of the picture.

Gelatine or albumen prints stand all ordinary usage without harm, but in a collodio print you have to deal with a film that is equivalent to an unvarnished collodion negative, and every photographer, with any experience, knows how delicate that is.—I am, yours, &c., G. N. F.

July, 16, 1895.

FAULTY PLATES.

To the EDITOR.

SIR,—The communication in this week's JOURNAL, headed "A Grumble from Paris," reminds me of an experience I had some time ago, before I came to Gateshead. I was supplied by my dealer with a box of 10 × 8 plates, which were used for photographing a vase of flowers. Three plates were exposed one after another, but each showed a sinuous dark mark, about half an inch wide, cutting almost across the centre of the plate. I was at a loss to account for this, and examined the camera—wondered if the cause was reflection from a worn part of the lens mount, &c. A fourth exposure, however, revealed the same mark—the marks were almost absolutely identical in all cases—the other way up on the plate; and, to me, this seemed at once to blame the plates. I took them back to my dealer—three exposed and fixed, one unfixed, and the eight

unexposed. He forwarded them to the makers. They replied to the dealer that they could not account for it, but a post later wrote me that they had discovered the solution to the mystery. The mark was caused *by the cuff of my coat sleeve which had been wet with developer!* Their solution to the mystery evinced such marvellous inventive genius and fertility of imagination, that I no longer could feel surprise at the commercial success they had achieved. I, sir, in common probably with the majority of photographers, poured my developer over from the *back* instead of the *front* of the plate, and so the "*cuff of my coat sleeve*" made a curved mark exactly alike on each of the four plates!

When asked if they had tried the remaining eight plates, the firm in question replied to the dealer that the said plates had been broken in transit. The matter ended there, or rather it ended when I paid my account, which included a box of 10 × 8 plates at 7*s.* 3*d.*—I am, yours, &c.,

Catherine-terrace, Gateshead-on-Tyne, C. H. Hewitt.
July 13, 1895.

SYSTEMS OF MARKING LENS APERTURES.

To the Editor.

Sir,—You mentioned in your answer to me the other day that you were thinking of publishing an article on the different methods (German and English) of calculating the apertures of lenses. I have had, by my request, from the English makers of mine, the relative apertures—apertures measured by the beam of rays: 7·7 = 8·99, English calculation 8 = 9·33, &c. I showed the letter on the subject from the makers to two members of the Camera Club (one of whom I had met before, and know to be well known in the photographic world), but neither knew that this system prevailed. I certainly think that an article in your valuable paper would do good by enlightening photographers on the subject. I myself bought the lens in question under the belief that the apertures were calculated as is customary in England, and am naturally disappointed at discovering that it is a slower lens than I thought.—I am, yours, &c., A. M. Z.

METERS OR CALCULATORS.

To the Editor.

Sir,—Permit me to enter a protest against the application of the word meter to certain exposure calculators which are not "measurers" in any sense of the word. It may be said that the term exposure meter is a conventional one, applicable to any aid to exposure. But, until 1893, every such instrument bearing the affix meter (some were termed photometers) did attempt the actual measurement of the light, and all the exposure books and tables, based on a theoretical estimation of the light, were called by their right names. Mr. Acland's adjustable scale, with three circular discs (used with an actinometer, and the forerunner in the application of slide rules to exposure), was merely termed an exposure scale; and another moveable card calculator, now widely advertised as an exposure meter, was, on its first introduction, called by its proper name—exposure table. It was not until 1893 that a well-known firm commenced this misleading practice, and now several others have followed it. Messrs. Elliott, of Barnet, gave (or did give) a useful little exposure card with each box of plates, and honestly call it by its right name. If they cared to follow the practice of which I complain, they could advertise "A valuable and absolutely reliable exposure meter given away with each box of plates."

Another illustration. Suppose it were possible to devise (to take the place of the household gas meter) a sufficiently reliable card calculator, based on the number of burners and the hours in use, which would give the estimated amount of gas consumed in a quarter, would it be fair to sell this calculator as a gas meter?

In all the applied sciences the affix meter is used only for instruments capable of actual observation or measurement (thermometer, chronometer, hydrometer, &c.), and purchasers of exposure meters naturally expect to get an instrument of actual observation, and did so until 1893.

I am not writing to deprecate exposure-table calculators. Supposing them to be superior for practical purposes to instruments which make an actual test of the light, they have still no right to use a false trade designation.

I know that the term exposure meter is at best clumsy, and not very accurate, but an instrument which is also an actinometer or photometer is at least entitled to be called a "meter." Alfred Watkins.

Hereford, July 13.

PHOTO-KERAMICS.

To the Editor.

Sir,—So much has of late appeared in the various photo publications which is derogatory to this, the only literally permanent photo printing process, that we appeal to you to remedy the matter. Most of the articles have been written or instigated by unsuccessful workers; for instance, one writer speaks of experiencing at least three failures to one decent print, another admits to many hundreds of spoiled placques; so strongly do they write of the impossibilities of the process that the generality of photographers can do no other than conclude the process cannot be worked even by a professional Keramist with any certainty.

Now, Mr Editor, you can, if you will, do much to remedy this and prove the capabilities of the various processes. For instance, if you would obtain a couple of really fine cabinet negatives, landscape and portrait, take from these a few contact transparencies (equal in quality) giving full detail, and allow such firms as apply to have a pair on condition that they return them to you free and within ten days, together with keramics therefrom. These results should be examined by you, with or without the assistance of others and you should then give your readers the benefit of such examination.

Quality and colour should be carefully noted, and comparison made with, say, a platinum print from the *original* negative. Hardness and cleanliness of glaze should next be considered, for a photo which is glazed with borax cannot fairly be termed imperishable. Attention should be given to the prices charged, and the time taken by each worker in forwarding results would also be an item of interest.

Price and poor work originally killed the demand for keramics. Price and good work should make them popular.

Returning to the writers on keramics, some of them are so well known, that there opinions on the difficulties or impossibilities of the process have ten times the value they deserve, others gas gloriously of a process of which they do not even know the very rudiments.

We know there are good workers in keramics, and we think there are not two who use a similar process, so each and all of us should welcome an opportunity of obtaining an honest and exhaustive criticism on the work, its probabilities and prospect.—We are, yours, &c.,

The Midland Photo-Keramic Company.

Nottingham, July 13, 1895.

AMATEURISM.

To the Editor.

Sir,—I think this is something of an amateur age—especially photographic. I would not like to say anything hard, because I was an amateur forty years ago; since then I have been a professional, and I cannot tell where the one stops short of the other. I have often thought the old photographic journals were just a little too kind to the amateur, and did not take the trade or profession enough under their care. But things are changing, we are now getting amateur photographic journals in the shape of our evening papers, and they are even beating our professional journals, for they get up *clubs*, which are very convenient places, and can serve all the purposes of other clubs, with many additional advantages; with best apparatus at their command they can do anything for themselves or friends in the way of printing, enlarging, &c., *for* money, or *for* pleasure, or *for* honours; and every one knows that members of photographic clubs are not likely to be exposed to any danger or temptation.

If they would just go a step further I would like, and by opening up information for some of us starved professionals about other professions we may begin just by making a little amateur profit, and that we may get out of the old trade into a new, why not have demonstrations for us, why not offer us prizes, why not give us all the wrinkle, of say, a lithographer or an arehitect? Ah, but these are select societies, you cannot touch the one without serving seven years, or the other without paying fees to the corporation, which would prevent any but their own select members having a client or taking money for making a few lines on paper according to scale.

Mr. Editor, there is something wanted; would you or some of your readers find it out for us? but no amateurs should say a word, they have plenty to do in what they call their camp.—I am, yours, &c.,

Arch. Robertson.

88, *Glassford-street, Glasgow, July* 12, 1895.

DOUBTFUL FELONY.

To the Editor.

Sir,—In your "Answers to Correspondents" column of this week's Journal, you state in reply to "R. E.'s" query that the magistrates might "inflict a nominal fine," and would "probably not allow costs," considering that the querist brought trouble on himself by his ungentlemanly conduct. To me this does not seem to be the case at all, though I do not profess any great law knowledge. I think that the offence in the case described was more serious than at first appears—was, in fact, a case of *larceny*. The technical definition of larceny, sir, is this: *The taking of a thing, the removing of it to another place with a felonious intent.*

In the case in point the plates were most certainly taken and removed to another place, and, in the eyes of the law, the action, because destroying the property, was felonious. Now, whether the photographing was gentlemanly or not is another matter; but, as our English law stands, it was perfectly legal to photograph under the circumstances. For instance, I have an absolute right to photograph anything I see (except, in some cases, fortifications, &c., where photographing is specially prohibited by law, and that extremely rarely, if ever, in England); but, if I *publish* photographs which are calculated to harm the position, reputation, or welfare of the persons represented, then I may be proceeded against for libel. I may photograph a person by means of, say, a hand camera, in any position, compromising or otherwise, and, so long as I keep that photograph for my own edification, my position is unassailable; but, as

soon as it can be shown that I have exhibited that picture to even a solitary individual, if it be of a compromising character, then my action becomes libellous.

I think, sir, the conduct of the parties in destroying the plates was premature and *actionable*, and, while I deprecate snap-shotting as too often practised, I cannot see how it can be prevented with the law in its present form.

I make no personal allusions, and know nothing of the matter except the statements contained in the paragraph in your JOURNAL.—I am, yours, &c., CHAS. HY. HEWITT.

Catherine-terrace Gateshead-on-Tyne, July 13, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, Ross's portable symmetrical No. 9, for portrait and landscape, Suter aplanat No. 2, fifty-two milimetres.—Address, OTTO, 79, West-street, Brighton.

Will exchange 8×5 camera (ROSS), rapid rectilinear, and three slides, for quarter-plate or 5×4 camera and lens.—Address, C. LINGARD, 4, Holmes-street, Derby.

Wanted, half-plate set, by good maker, latest improvements; will exchange pneumatic safety. A bargain.—Address, M. M. BLAND, 42, Talbot-road, Blackpool.

Will exchange 10×8 burnisher, by Sands & Hunter, equal to new, for good retouching desk with drawer and mirror, whole-plate and upwards.—Address, ROBINSON, Mumbles.

Will exchange sixty-one 1s. parts of Cassell's *Picturesque Europe*, perfect and clean, early edition, for good quarter-plate hand camera.—Address, A. HAIGH, 5, Bell-buildings, Oldham.

Will exchange a metal plane for mitring, with brass lever, and running in metal grooves, for three double half-plate dark slides.—Address, W. JONES, 272, Uxbridge-street, Burton-on-Trent.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

John Terras, Markinch.—*Portrait of John Delaney.*

Edwin Feather, Haworth.—*Photograph of Bronte Souvenir.*

James Whyte, Glasgow.—*Ten Portraits of Rev. John Robertson.*

John Patrick, Edinburgh.—*Portrait of Alexander Anderson, and Mr. Dalziel.*

James Parkinson, Warrington.—*Two views of opening Park Gates, Warrington.*

George Taylor, Bishop Auckland.—*View of the Co-operative Stores Building, Bishop Auckland.*

George Bellett Cowen, Ramsey, Isle of Man.—*Photograph of John Kennish and his Manx thatched cottage at Ballure; and James Cottier, Fisherman, Ramsey.*

J. H. W.—We cannot recommend any particular firm as being the best collotypers in this country. Consult our advertisement columns.

B. WELLS.—Simply wax the ground opal with the same solution as that used for zinc plates, and omit the collodionising. You will then experience no trouble.

C. D. G.—Here is a formula for a substratum for collotype plates that was very generally used in Germany when the silicate was employed there:—Water glass, 60 grammes; Bavarian beer, 360 grammes.

P. S. P.—The indistinct markings on the prints are due to the paper not being in close contact with the negative in those parts. Probably the backboards of the printing frames are not flat, or the pads are uneven.

PRINTER.—The thin sheet gelatine, suitable for photographic purposes may be had from any of the dealers in lithographic materials. Corneillesen, Long-acre, also keeps it. That made for parcelling sweet-meats is rarely good enough for photography or lithography.

C. L. H. (Brigg) writes: "I should be obliged if you would kindly give me the names and addresses of Continental firms who make prism-grinding a speciality."—Steinheil & Son, Munich, we know, make them a speciality. Zeiss, of Jena, we think, also makes them.

BETA asks: "1. Can a photographer legally attach the word 'copyright' to all his prints indiscriminately, when they have been in no way copyrighted?"—Reply: It is illegal to do so. "2. Supposing the photograph of a group of people has been made 'copyright,' is it an infringement to copy any one figure singly?"—Reply: It is an infringement.

DR. J. MOLE (Groningen).—The article in question was taken from the *American Journal*, to which it is credited. The photo-mechanical plates of Mawson & Swan are very good, and we are unaware that any better for the purpose are made in America. Both there and in Europe wet plates are still in general use for the highest class photo-mechanical work.

WARDER.—The plates you have been using are very good indeed, but they are far from being rapid. The same firm supply two faster brands than those, and you cannot do better than sample them or the rapid makes of other firms. We can fully realise your difficulties with refractory prisoners. More rapid plates will get over many of your difficulties. Thanks for the interesting examples.

T. BIRTLES.—The thing is lamentable. But no Union can regulate prices. Every one has the right, and will use it, to charge as much, or as little, as he likes for his work. The prices quoted on the coupon enclosed are higher than on some others in other towns. Indeed, they are higher than those in some houses without any "coupon" at all. The thing is to be regretted, but nothing more practical can be done.

P. W.—We do not see why you should complain. Certainly you have no remedy. The candidate (M.P.), when he had his portrait taken by you, paid for it in the ordinary course. That he has had it reproduced, and "used it by thousands for electioneering purposes," is no concern of yours. You say you were paid for taking the portrait, and that is an end of the matter. The only thing we can suggest is that you do not vote for the gentleman.

LEEDS.—The work on collotype is about the best you could have. The formula quoted is all right, although you have not been successful with it. That is not, however, the fault of the formula. It must not be surmised that a process like collotype can be mastered in three or four essays. It, like every other process, has to be learnt, and that can only be done by considerable perseverance, and more depends upon method and experience than mere formulæ. No one supplies collotype plates ready for use, as they will not keep good for many days.

T. SIMCOE writes: "A few days ago I sent for some methylated spirit from the only shop in our little place that sells it. On adding some water to it, the mixture became quite milky. It was returned as being methylated 'finish' instead of spirit. The seller said it was not, and refused to change it. Is not the milkiness a proof that the spirit contained gums—*i.e.*, was finish?"—No; under the last regulation with regard to the sale, in small quantities, of methylated spirit, a certain small proportion of mineral naphtha must be present, and it is that which causes the milky appearance on the addition of water, and not necessarily the presence of resins.

T. FOSTER says: "I have lately been troubled with the tube in which I keep my platinotype paper stored in. I have kept it in a tin tube, which is air-tight. When it has been closed up for a day or two the calcium gets damp, and all round the inside of the tube is wet, therefore it spoils the paper. Can you kindly give me a remedy for this, and say if the calcium can be dried?"—It is pretty clear that the tube is not air-tight, or that it is left open long enough for the chloride of calcium to absorb moisture from the air—probably the former. The chloride of calcium can be dried by fusing it in an iron ladle over the fire; but, as the salt is so cheap, it is scarcely worth the trouble.

PROVINCIAL.—If the apprentice is unruly, and does not obey your lawful orders, the only remedy is to take the case before the magistrate. It is quite possible, however, if that be done, that the case may go against you. The magistrates may consider that an apprentice in photography, with whom a substantial premium was paid, may lawfully refuse to sweep up all the rooms and staircases every morning, after three years of his apprenticeship, as well as do other and more menial work. Sweeping floors and doing household drudgery is not being taught photography, although there may be no photographic work on hand at the time. An apprentice is an apprentice to learn a trade, and is not a mere menial servant, and that is the view that a magistrate will take of the matter.

A. M. asks: 1. "Are passports for amateur photographers necessary for either Holland, Belgium, or Germany? I believe Switzerland does not require one. (In your issue of June 21, in 'Correspondence column,' you mention Passports—thus my inquiry?) 2. Exposures, especially in Switzerland. Can you recommend any exposure table that would prove reliable? Ilford ordinary plates and films (from ordinary to rapid would be used). R.R. lenses would be used? 3. Plates. Can these be bought at any of the chief towns in the countries mentioned above, and can they be depended upon, or would you advise all plates to be taken with us?"—1. Passports are not necessary in either country. But it is advisable to have a passport if travelling in Germany in the neighbourhood of the French frontier. One may sometimes save trouble. 2. We have had very little practical experience with exposure tables. We always estimate the exposure by the appearance of the light. Any tables that you are familiar with in England will serve also in any other country if a little judgment be exercised. 3. We presume they can be, but we certainly advise the plates to be purchased here. Then what are used can be relied upon. That is not always the case with those brought abroad, though of English make, as the dealer may have had them in stock for a long time.

CONTENTS.

	Page
COMBINING BADLY MOUNTED STEREOSCOPIC PICTURES	449
ANOTHER SUCCESSFUL COPYRIGHT ACTION	449
ENLARGED NEGATIVES. By W. B. BOLTON	451
PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM	452
PRESIDENT'S ADDRESS	453
PHOTO-MECHANICAL NOTES. By WILLIAM GAMBLE	456
A SELF-LIGHTING GAS BURNER	457
THE PHOTOGRAPHIC NATURALIST. By J. VINCENT ELSDEN	457
A USEFUL VARNISH. By HALL-EDWARDS, L.R.C.P., &c.	458
NOTES ON HAND-CAMERA WORK. By W. THOMAS	458
THE KEEPING QUALITIES OF CELLULOID FILMS	459
ELECTION PORTRAITURE	459
SEASONABLE NOVELTIES	459
NEWS AND NOTES	461
RECENT PATENTS	461
MEETINGS OF SOCIETIES	461
CORRESPONDENCE	462
EXCHANGE COLUMN	464
ANSWERS TO CORRESPONDENTS	464

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 1838. Vol. XLII.—JULY 26, 1895.

WHOLESALE DEVELOPING.

It must be obvious to all who give thought to the matter that in large establishments, where, of necessity, large numbers of plates have to be passed through the developer every day, some systematic mode of getting through the work must be planned out and adopted. The result of inquiries set afoot and observations made by us have shown that this is the case, and it is more than possible that some hints of practice may be gleaned from what we shall be able to say on such foundations.

The principle of working adopted by one popular photographer, though it has before now been described, may be alluded to. He says—and he said it before Messrs. Hurter & Driffield's classical investigations were published—there is one correct exposure, and all others are wrong; though this one is not a mathematically exact period of time, it allows some latitude. In practice, therefore, using one brand of plates and a stock developer, he does not "attempt to tinker with his negatives; he puts them all into a dish or other receptacle at once, gives all alike one definite time of development, never looks at a single one, and, at the expiration of the time, takes them out, washes and fixes them." This is truly heroic treatment; but he shows fine results, although, as he says, "he never worries." In studio work, where long practice under similar conditions enables the photographer, if he be fairly skilful, to make the minimum number of incorrect estimates of the exposure period, such a system—or want of it—may be fairly successful; but, where the exposures have been spread over a wide range of subjects and their various aspects, the adoption of such a method would be very unlikely to result in uniformly successful negatives.

At the same time it may be stated that, although this certainty of having given correct exposures may not be felt, it is yet possible, under proper conditions, to develop, at one time, large batches of plates whose exposures have been very varied.

It appears to us that herein lies the whole secret of working large numbers of plates with success. Where exposures under uniform conditions have been made, there is little difficulty; where exposures are less a matter of certainty, there are far more difficulties.

Taking the former method first, we may say there is little practical limit to the number of plates that may be brought under treatment at once; we have often seen from a dozen to nearly three dozen half-plates under hand at a time. It is more a question of space and the possession of plenty of the requisite utensils. When two or three dozen plates are manipulated at once, it is clear that a number of dishes must be employed, for the actual superficial area the plates would occupy is beyond the capabilities of any ordinary dish. If placed touching one another in a flat dish, they would cover nearly eight square feet; but, as it would be necessary for a little space to be left between them to permit of handling the negatives, over a square yard of space would be required. Then the further point arises that, unless wastefully large quantities of solution be used, it would be very difficult to level one large dish sufficiently exactly to prevent some of the plates being left dry while others were too fully covered.

Let us consider the case of a suitable number of dishes containing a large number of plates. A normal developer, containing half the maximum possible alkali, will be mixed. Three dozen will probably need about half a gallon or more of developer. Divided into as many separate portions (each in a suitable measure or jug) as there are dishes, it is rapidly poured over them, with the help of an assistant, so that all are immersed as nearly simultaneously as possible. Very shortly after the images appear, the experienced hand will be able to judge how the exposures have been—correct, over, or under. It will then be easy, before the images are fully out, to sort the plates so that all in one dish shall be of a similar class. To the practised hand, who can make up his mind at once what is needed, the requisite quantity of accelerator or retarder can be added when needed. It is said that it is actually easier to develop a dozen or two at once than a single negative, for the indications of one assist the other.

When dealing with uncertain exposures, the above method will not permit the full value of accelerator, &c., being obtained, as the character of the negative might be given before the requisite addition to the developer could be made. What, then, is desirable is a sufficient dilution of the developer, that the faultily exposed plates can be removed and suitably treated without hurry or risk.

We were amused the other day to hear an amateur state that to develop eight plates at once was an impossibility, and possibly, to those whose experience is limited to the development of half a dozen at a time, three dozen will seem a large number to manipulate at a time; but we may at once say it is by no means uncommon. In fact, the business of large firms could not be got through in any other way. Further, we describe what we have seen. Finally, we may say that the number of plates that may be developed at once has scarcely

any limit, provided it be carried out rigidly, systematically, and by one thoroughly experienced and not liable to lose his head in an emergency.

THE TREATMENT OF GELATINE PRINTS.

Since we made brief allusion, in our article on *Washing Gelatine Films in Hot Weather* a fortnight ago, to the treatment of prints, several points have arisen to induce us to return to the subject in its special bearing upon gelatino-chloride papers in contradistinction to negatives and developed prints. A letter which appeared in our last issue over the signature of "A Photographer's Son," containing, as it does, a wholesale condemnation of modern gelatine papers as compared with albumen, does such palpable injustice to the former that we think the writer's experience can only be based upon an almost total neglect of the necessary differences in treatment of the two classes of paper, and as many others, no doubt, fail from similar causes, we desire to supplement our previous remarks by pointing out what those differences are.

Our correspondent's description of the results obtained upon gelatino-chloride paper as "yellow, rat-red, double-toned productions," is so at variance with the experience of the best modern workers, that we should scarcely have returned to the subject if we had not been aware that such results are only too frequently obtained by others, though we have little doubt but that the same individuals would have even worse success if they turned from gelatine to albumen.

That equally good tones and as pure whites are obtainable with gelatino-chloride paper as with the best albumen is a fact that hardly requires emphasising, but we may go further and say that such results are attained with greater ease and with a class of negatives that would be utterly useless if printed by the older method. One of the chief points, in fact, in favour of gelatino-chloride paper, is that it will give brilliant prints from negatives altogether too thin and delicate, or, as some may prefer to describe them, too poor, to give any satisfactory result with albumenised paper under any circumstances; and this, too, without losing the capability of yielding all the gradations of a rich, dense negative. The failure to attain to this degree of success must, then, be due to carelessness or inattention to the proper method of treatment.

The main cause of the failures in this direction is, no doubt, to be traced to the physical difference between the two classes of paper in the first instance. The hard surface of the coagulated albumen permits that paper to be submitted to a course of comparatively rough treatment in the processes of washing, which the softer film of gelatine will not bear with impunity. Prints upon the former may be left with perfect safety in any of the automatic washing arrangements, or in a vessel of water under an ordinary tap, the constant motion and friction of one against the other thus obtained resulting in a very thorough washing, without any injury to the prints themselves.

The first lesson that the beginner in gelatino-chloride printing learns is that the new paper will not stand this, or, at least, that a considerable proportion of his prints become more or less damaged in the process; so, with the intention of being careful, he flies to the opposite extreme, and resorts to careful soaking, making up for the want of motion by prolonging the action. This is just where the first trouble supervenes.

The character and quality of the tones in the case of gelatine paper depend quite as much as, or even more, upon the thorough removal of all soluble matter before the prints enter the toning bath than with albumen, and it is chiefly owing to the inefficient and incomplete manner in which this apparently simple process of washing is carried out that uneven and inferior tones are obtained, as well as loss of colour in the fixing bath. It cannot be too strongly impressed upon users of gelatine paper that long soaking before toning not only does not thoroughly free the prints from soluble matter, but that it is absolutely injurious, as by leaving them for a protracted period to "stew in their own juice," or in a more or less concentrated solution of the soluble matters extracted from them, all hope of brilliancy of tone is lost. The soluble salts, too, when a number of prints are left massed together, even for a short time, are incompletely and unevenly removed, with the result of a corresponding unevenness in tone, while any traces of soluble matter remaining in the prints not only act injuriously upon the proper action of the toning bath, but also give rise to fugitive and deceptive tones, which disappear, or are greatly changed, when the prints pass into the fixing bath.

Here we have a quite sufficient explanation of the cause of "yellow rat-red" tones, whatever the latter may be, while the double toning, if not due to trying to tone too many prints in an exhausted bath, is as likely as not indirectly traceable to that cause, since the introduction of foreign matters into the toning bath, by throwing the gold out of action, produces a similar effect.

The proper treatment for gelatine prints, previous to toning, consists of thorough and rapid washing, instead of prolonged soaking, no matter how many or how few pictures are under treatment. If a single print be left to soak for an hour in a moderately large volume of water, it will not be as completely deprived of its soluble matter as if allowed to remain for one minute each in five or six changes of far smaller bulk. If no satisfactory method be available of automatically keeping the prints in motion, no better plan can be adopted than that of passing them rapidly, one at a time, from one dish of water to another. The first two or three changes should be made as rapidly as possible, in order to get rid of the bulk of the soluble salts; after that it is of less importance, and they may be allowed to soak for two or three minutes, but in no case is it desirable to protract the washing beyond ten minutes or a quarter of an hour. The practice of using a bath of salt, in order to convert any traces of free silver, scarcely presents any advantage over plain washing, since, unless the salt itself be thoroughly removed, its action in slowing the toning is rather injurious than otherwise. For the same reason as we mentioned in our previous article, it is inadvisable to employ the preliminary alum bath, and if in very hot weather it be absolutely necessary to employ any substitute, such as Glauber's salt, it must be thoroughly washed out before toning.

Another prolific cause of bad tones and slow toning is found in the failure to recognise the difference in the action of the various toning baths upon albumen and gelatine papers respectively. A few years back the great difficulty was to get gelatino-chloride paper to tone at all, and baths of abnormal strength were resorted to, one grain of chloride of gold to two ounces of water being no uncommon strength. Now it is quite the other way, for, if two prints respectively upon gelatine and albumen be placed side by side in a fresh bath of either acetate or phosphate, the former will be toned in half the time the

latter takes. In fact, regularity and quality of tone are promoted by the use of a bath that would have been considered weak or slow in the days of albumen; a strength of one grain of gold in ten ounces of water will, in fact, be found to work quite quickly enough to be conveniently manageable, and to give better and more even tones than one of greater strength.

Another point in connexion with the toning bath in which it differs in its action upon albumen and gelatine papers respectively is in its age. In the old days it was customary, even with such baths as the phosphate, carbonate, or borax, to allow them to stand an hour or two after mixing and before use, otherwise they were apt to give "mealy" tones. With gelatine, on the other hand, these may be employed almost immediately after mixing, and will then act not only with greater rapidity, but if anything give brighter tones. The acetate bath differs a little in this respect, but even that may be used within a quarter of an hour of mixing, and is then quicker than if kept some hours.

After toning the only care requisite is to wash perfectly, in order to prevent the action proceeding further than is required. Here the salt bath becomes useful in at once arresting all further action. The prints may remain in this until ready for fixing, but should be rinsed in one change of water, in order to avoid introducing any trace of gold into the hypo bath.

If the ordinary directions with regard to the fixing bath be observed, there is little danger of anything going wrong at this stage. The chief points to be observed are that it should not be too strong—three ounces of hypo to the pint of water, as usually recommended, is quite strong enough—and it should not be allowed to act too long. If the prints are turned over singly two or three times during the operation, ten minutes will be quite sufficient, for here, as in the washing before toning, rapidity combined with thoroughness should be the principle. If left to soak in a mass, the operation of fixing is not thoroughly performed unless the process is much prolonged, and the longer the hypo is allowed to act the more will the tones of the prints be likely to suffer.

The washing after fixing, or the method of it, is another matter of importance, and here, again, the importance of *quickly* getting rid of the bulk of the hypo should be thoroughly recognised. One change of water in the early stage is worth two or three later on, and it more than repays the trouble, therefore, to give a little more than the ordinary care at the commencement. A very good plan we have seen used, and have adopted ourselves, is to have a basin of water next the fixing bath, and, on removing the prints from the latter, to rinse them simply in the basin and pass them on at once to a dish of clean water. In this manner the great bulk of the clinging hypo solution is removed before the prints are placed to soak, and if the first washing water be changed, or the prints themselves changed singly to a second dish as soon as the whole of them are out of the fixing bath, there will be but a very minute quantity of hypo left to remove, and after this they may be allowed to soak for five minutes between changes for an hour or so.

Coming to the question of the final alum bath, we have little hesitation in saying that this is the cause of more unstable prints than anything else. Not, be it said, that the alum itself, or even in its combination with unremoved hypo, is to blame, but simply the carelessness or perhaps ignorance of the operator. Of course, as we have often pointed out, if the alum be used to decompose unremoved hypo, we must of necessity expect the formation of dangerous compounds; but, even when the hypo is completely removed, first the alum itself is a danger if, as is too often the case, it is not thoroughly and completely eliminated, as it is certain in time to cause the print to turn yellow, as if it were imperfectly washed after fixing.

If alum is used, then another thorough washing should follow it, but this need not be so protracted as the previous one. Half a dozen changes of the prints, singly from dish to dish, will suffice, but nothing less. As the function of the alum is merely to harden the surface of the print sufficiently to remove its unpleasant stickiness when mounting, a very superficial application will suffice; in fact, if the prints are immersed one by one in the alum solution, and at once transferred to a dish of clean water, the necessary duty will be performed and the need for a very prolonged washing considerably decreased.

If gelatino-chloride prints be treated on the lines we have laid down, we think there will be no room for complaint in any direction.

Photography and the Election.—By the time this reaches the reader, the general election of 1895 will be practically over. During the present election photography has, without question, been more extensively used than it ever has been in any previous one, though, as we said a fortnight ago, not altogether to the credit of the art. Process blocks have been, generally, the method employed, and very bad, indeed, have been the results. The fault, as a rule, has not been with the blocks, but with the printers. But there, no one expects fine examples of printing for electioneering purposes, or, if they do, they fail to obtain it—so much the worse for the credit of the makers of the blocks. They may, however, in many instances, take consolation from the fact that the prints were so bad that the names of the producers of the blocks are quite obliterated in the printing.

Advertisement Frauds.—We have frequently cautioned readers against sending money for things advertised for sale without knowing anything of those to whom they are sending it. At the present time one, Walter O'Reilly, of Edgware-road, stands remanded at the Marylebone Police Court, charged with obtaining money by false pretences. Mr. O'Reilly was in the habit of advertising from different addresses as the "Demon Camera Company," the "American Camera Company," &c., to supply certain apparatus on receipt of certain sums, and particularly, of late, the "Mysterious Manx Manikins." It is alleged that the orders were not executed, and that the prisoner kept the money. The police state that they have received something like ninety complaints about the prisoner from different parts of the country. If what is alleged against the man be correct, we have no doubt he will get his deserts. We again, however, caution our readers against parting with their money in connexion with advertisements without making some inquiries.

Will the New Parliament deal with the Copyright Question?—Several times during the past dozen years, Bills have been introduced into the House, and printed, dealing with the copyright question, particularly with reference to photographs. In fact, for several years in succession Bills were introduced, and reference to the subject has even been made in the Queen's Speech. During the past few years, important as the matter is to a large profession, the matter has been allowed to drop, in face of more engrossing topics. The general election has gone far enough already to ensure a Unionist Government, whose programme, it is understood, is to be for social improvements, and amongst them it is to be hoped that the copyright question will not be lost sight of. We know that many amateur photographers in the new Parliament are readers of the JOURNAL, and to them we commend the subject. Possibly the London Chamber of Commerce, which has a photographic section,

may also use its influence. Should any Bill be introduced, photographers will have to look after their own interests, for some of the Bills that were previously introduced, were framed more in the interests of painters and picture dealers than they were in those of photographers.

Another Printing Paper.—The specification of a patent, applied for on behalf of a German house, has just been published for a new photographic paper, which is evidently intended for the purposes of the blue paper, so much used for architects' plans and drawings. It is an iron process, and is not unlike one described by Hunt in his *Manual of Photography* more than forty years ago, except that the sensitising agents are applied in a single solution instead of two. The formula, as given in the specification for the preparation of the paper, stands thus:—

Water	1000 parts.
Ammonio-citrate of iron	80 to 100 „
Nitrate of silver	12 „ 20 „
Tartaric acid	15 „ 20 „
Gelatine	10 „ 15 „

After exposure to light the picture is fixed by simply washing in water. The image is said to be a good brown on a white ground. It is said by the patentee that this paper has advantages over the old blue paper, and that it is very sensitive to light.

The Illustrated Press and Process Blocks.—We are pleased to find that the remarks we passed a few weeks ago, on the circumstance that the illustrated press was giving a place to engraved blocks where process blocks had been very generally used, have called forth some comments. We have several times, during the past year or two, emphasised the fact that, although this country may be a little behind some Continental countries in one or two of the photo-mechanical processes, it is not so with process blocks, and that as regards them England can hold its own against all comers,—that is to say, the excellence of the blocks themselves. But we are sorry to say that in the printing of them we must take a somewhat back seat, and it is for that reason, we suspect, that the weekly illustrateds are now going in more for engraved blocks than they did some little time ago. In America typographic printing is carried almost to a refinement, and it was found there that to get the best effects, particularly with such fine work as process blocks, special machinery was imperative, and it was adopted, as it was afterwards here. The British workman is conservative, and does not take kindly to innovations in his old methods of working, and these were necessary with process blocks. Hence process blocks did not, and do not now, receive the same kind reception in the machine-room as do engraved blocks, for they require far more care and greater skill at the machinists' hands. The publishers cater for the public, and the latte do not care a straw how the illustrations are produced so long as they are good, or, at least, good to their idea. A few months ago, when looking through one of the leading weekly sixpennies, which was one of the first to adopt process blocks, a lady present remarked that the best illustrations were those in the advertisements, which were engravings, and with this particular number that was really the fact. Be the reason what it may, there is no gainsaying it, the best-class weeklies are to a great extent substituting for process blocks engraved ones, and so much the worse for photography and process workers.

Summer Moonlight Photographs.—Although, during the winter months, we hear a good deal of moonlight pictures, it is seldom we find any one attempting them in summer, notwithstanding the chances of success would seem greater. So far as mere success is concerned, it is now an easy enough matter to produce very perfect moonlight pictures in the darkest months, and, as a matter of fact, it is perhaps easier than in summer, for, while in a frosty atmosphere the atmosphere is clearer, the period of bright moonlight is much longer than in summer. Perhaps in the months of June, July, and August it might be said that a real moonlight picture, in the sense of one taken by the light of the moon, is an impossibility, since a great portion of the comparatively short period during which the moon is above the horizon at the full is actually daylight, and the rest only twilight. In an attempt we made a day or two since from the full moon at the beginning of the present month, twenty minutes' exposure between eleven o'clock and midnight, with the lens at *f*-16, gave what appeared to be a flat, over-exposed daylight picture, with a very faint sun shining. In fact, the twilight illumination of the shadow portions of the picture, consisting wholly of foliage, was sufficient to impress the plate almost as strongly as the moonlight did the other portions, and it does not appear at all beyond the range of possibility that at this time of year, on a clear night, and with a very quick plate, pictures may be made without moonlight at all. At any rate, as we suggested some months ago, there is an opening for artistic moonlight effects, and, as full moon is now not far off, we would suggest to our experimentally inclined readers the attempt to produce, by the combined aid of moonlight and twilight, something in the shape of a real picture. The artist will find himself, however, much more restricted in his choice of points of view, as well as of time of exposure, and the chief difficulty will be to select a view or a bit of scenery suitable for the occasion on which the moon condescends to shine in the short hours during which it is not actually daylight. Subjects with a westerly aspect will be suitable between sunset and midnight, and easterly between midnight and dawn. North and south aspects are almost out of the question.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

SHREWSBURY MEETING.

Tuesday, July 16.

At the evening meeting the following paper was read:—

SOME POINTS IN CONNEXION WITH TONING AND FIXING GELATINO-CHLORIDE PRINTS.

By C. H. Bothamley.

The object of this paper is to call attention to certain points in connexion with toning and fixing, more especially with a view to a better understanding of the changes that take place in what is commonly known as the combined toning and fixing bath. It is sometimes urged that, since good results can be obtained by the use of separate and successive toning and fixing baths, the combined bath should be avoided. As a matter of fact, however, there is a somewhat widespread opinion, in which I for one share, that a good combined bath, giving results equally permanent with those obtained by the use of separate baths, would be a very great advantage. From a commercial point of view there would be much saving in the cost of production, owing to the reduction in the number of washings and the labour in general, and, from the amateur point of view, the saving in time would probably lead to much more printing being done.

The experiments described in this paper, and illustrated by the examples exhibited, are only to be regarded as of a preliminary character, although they lead to some definite conclusions.

One of the oldest of toning processes is that in which the print is immersed in an acidified solution of hypo. Acetic acid was generally used, but a similar result can be obtained by the addition of alum solution. When a gelatino-chloride print is placed in either mixture, it is first fixed, and, if withdrawn at this stage and washed and dried, it has the well-known red-brown colour of a print fixed in a neutral bath. If, however, it has been allowed to remain in the liquid, it gradually would have acquired a colour that cannot be distinguished from the colour obtained by gold toning, although, of course, no gold has been deposited. It follows that the so-called "sulphur toning" is subsequent to, and not simultaneous with, fixing. Further, no difference was observed between the effect of a hypo solution that had been acidified some time previously, and was very turbid with precipitated sulphur, and a hypo solution that had only just been acidified, and in which the precipitation of sulphur was only just beginning.

The addition of a lead salt, usually in the form of acetate or nitrate, to the combined bath is often recommended, mainly on the

ground that it exerts an influence on the molecular condition of the deposited gold, and yields prints of a more desirable colour than can be obtained if the lead salts are omitted.

If a solution containing twenty parts of hypo and one part of lead acetate per 100 is used, the prints are first fixed, and subsequently acquire a purplish colour indistinguishable from that obtained with a gold bath, or with acidified hypo. Similar results are obtained with lead nitrate, in place of the acetate. Both solutions are quite neutral in reaction, and do not precipitate sulphur, and hence, although the resulting colour of the print is similar to that obtained with acidified hypo, it cannot be ascribed to the sulphur toning, and must be brought about in a different way.

The chief point to be observed is that, in acidified hypo or in hypo containing a lead salt, a gelatino-chloride print may acquire a colour that cannot be distinguished from the colour obtained with gold. Now, it is generally admitted that the probable permanence of a silver print is directly proportional to the quantity of gold that has been deposited on the image. It is conceivable that in a combined toning and fixing bath that contained or was supposed to contain gold, and also had been mixed with alum or a lead salt, or both together, the actual toning or colour change that took place might be due mainly, if not entirely, to the effect of the alum or the lead salt in the manner just described, and not to the deposition of gold; in other words, the print would seem to be gold-toned, whereas little or no gold was actually present.

Examination shows that with acidified hypo, or hypo mixed with alum, or neutral hypo containing a lead salt, the toned image contained a notable quantity of silver sulphide, or, in presence of the lead salts, possibly lead sulphide. The quantity, however, is not such as to indicate that the whole of the image has been converted into sulphide, nor as to make it permissible to attribute the change of colour to "sulphurisation." The greater part of the image still consists of the silvered compounds as altered or reduced by light.

It was observed by Just, and confirmed by Valenta, that the paper itself obstinately retains small quantities of lead from baths containing lead salts. Attention has recently also been drawn to this fact by Mr. Baldock, at one of the London societies. The fact has been known for some time, and the attention of chemists was called to it several years ago by Mr. L. T. O'Shea. The specimens exhibited show very clearly that pure paper will take up lead from a one per cent. solution of lead acetate with lead nitrate, and retain it even after prolonged washing. It is also clear that, in presence of hypo (twenty per cent.), the quantity of lead retained is much smaller, and that it is still further reduced by a second treatment with hypo solution containing no lead. Even in the latter case some lead is still retained, and the quantity is quite sufficient to cause discolouration of the paper in course of time.

The general conclusion, therefore, is that the use of lead salts in a combined toning and fixing bath should be avoided because of the danger of lead being retained by the paper in spite of thorough washing, and that the use of lead salts, of alum, or of an acid, should be avoided, because any of them will cause a print to acquire a colour indistinguishable from that produced by gold, even though no gold at all has been deposited. It is obvious that in this case the probable permanence of the prints is much lower than if they were properly toned with gold, and the observations described throw light upon some previously puzzling cases of the fading of gelatino-chloride prints.

A short discussion followed.

Wednesday, July 17.—The General Meeting.

This was held on Wednesday morning, July 17, an interesting feature of it being a statement relative to the finances of the Convention, made by Mr. Drage. It appeared that, in addition to the Birmingham debt having been cleared off, a sum of 50*l.* had been invested, and there was a balance of 26*l.* in hand. About 200 members had attended the Shrewsbury meeting.

Mr. Bothamley moved a resolution to the effect that grants be made in aid of scientific research, and, if carried, thought it would redound to the credit of the Convention that it was the first photographic Association to make specific grants in aid of photographic research. His resolution embodied a proviso that the funds should not be applied to the purpose except they be above a clear balance of 50*l.* The resolution was seconded and carried.

A rule necessitating that new candidates for membership must be nominated by existing members, and also empowering the Council to exclude objectionable persons was adopted.

The invitation of the Leeds Photographic Society for the Convention to hold its 1896 meeting at that town having been cordially accepted, the President (Mr. Haddon) pointed out the undesirability of inviting societies being put to expense on the occasions of the Convention's visits.

Mr. J. H. Walker (President of the Leeds Photographic Society) described the natural advantages of the country surrounding Leeds, and said that both the Committee of the Society and the members were unanimous in the desire to have the Convention at Leeds next year.

The following gentlemen were added to the General Committee:—Mr. J. H. Walker; Mr. Washington Teesdale; Colonel E. C. Peele; Mr. A. Mackie; Mr. Percy Lund; Mr. J. Howson; Mr. T. Fall; Mr. W. Crooke; Mr. C. Keene; and Mr. A. Mowll. Messrs. Howson and Fall were appointed Auditors.

The group was then taken on the portico of the Salop Infirmary, by Mr. Laing.

In the afternoon, about sixty members went to Haughmond—Messrs. Burson, Ebrall, and Irwin acting as leaders. The light was everything that could be wished, and, after a good time had been spent in the vicinity of the famous hill, an adjournment was made to the Uffington Hotel, were tea was served on the lawn.

The Annual Dinner.

The annual dinner took place in the front room of the Music Hall in the evening. Mr. Haddon presided, and was supported by the Mayor of Shrewsbury (Alderman W. G. Cross), &c., the company numbering upwards of 140. At the conclusion of the dinner, the President proposed "Success to the Photographic Convention." He remarked that they were having a very pleasant meeting at Shrewsbury, and he was pleased to say that the Convention was increasing in importance each year. They commenced in a small way some years ago, and did not make much headway, financially speaking, for a time, but now they had a balance of something like 70*l.* to the good. With the toast he coupled the name of Mr. R. P. Drage (Hon. Sec. of the Convention).

Mr. Drage, in reply, said he hoped they would not give him all the credit for the success of the Convention, by a long way, for although he had worked pretty hard during the year in arranging matters, he had been most ably assisted by the Council in London. The work had undoubtedly been laborious, but he did not regret it for one moment now that he saw so many happy faces around him, and, if he were elected Secretary for another year, he should try to do his best in the future. Before sitting down, he wished to mention the name of Mr. M. J. Harding, of Shrewsbury, for he had supported him (Mr. Drage) most nobly. He should also wish to acknowledge in some way the great services rendered by Mr. F. W. Williams, who was the right man in the right place for organising a committee, and he had been well supported by Messrs. Della Porta, Burson, Laing, Irwin, Ebrall, and other gentlemen. The members of the Convention thanked all those gentlemen, and especially the Hon. local Secretary, for his indefatigable services.

Mr. Harding thanked the company for the exceedingly kind references made to him. Assisted by Mr. Drage, he had tried his utmost to carry out their wishes. There was no doubt that the invitation from the Shropshire Camera Club to the Convention was a very plucky one, after the munificent hospitality shown at Dublin last year. The anxiety of the Local Committee was to show how they could let the Convention down from the giddy heights of last year without coming an awful cropper. (Laughter.) Several members of the Council, however, made it clear that they did not expect that sort of thing to be repeated—(Laughter)—and their confidence in their own local district as regard attractions was such that they had no hesitation in giving an invitation to the Convention. He trusted that the meeting would be a pleasant and enjoyable one.

Mr. C. H. Bothamley proposed "The Local Committee, and Success to the Shropshire Camera Club." He said that he had very great pleasure in proposing the toast, and, alluding to the remarks made by Mr. Harding about last year's meeting, said that that gathering was a peculiar one in one way, because they were received not only by Dublin but by Ireland. Shrewsbury could not hope to compete with Dublin in many ways, but they could in others—in offering them a

right hearty welcome, and they had done so. They knew that some excellent excursions could be arranged, and the Local Committee had done that. For mercies received and for mercies to come, the visitors heartily thanked the Local Committee as well as the members of the Club. With the toast he coupled the names of Colonel E. C. Peele (Chairman of the Reception Committee), and Mr. F. W. Williams (President of the Shropshire Club).

Colonel Peele, in reply, said the Local Committe were entitled to no special thanks; they had simply done their duty, and, if their little endeavour had given satisfaction, they were amply rewarded.

Mr. Williams, replying on behalf of the Club, said the members thanked the visitors for accepting their invitation in the very hearty manner they had done.

After other toasts, an adjournment was made to the large room, in which a smoking concert was held.

Presentation to Mr. Cembrano.

In the course of the evening the President, after referring to the admirable services Mr. F. P. Cembrano, jun., the late Hon. Secretary, had rendered to the Convention, presented him with a beautiful hand camera, specially made by Messrs. Newman & Guardia, which had been purchased by the subscriptions of a large number of members.

Mr. Cembrano, who was heartily cheered, briefly thanked the members for their kindness.

Thursday, July 18.—"Remember Church Stretton."

A most delightful excursion took place this day to Church Stretton, whither a large party was conveyed by special train. The day was everything that could be desired for photography, and it is needless to say that cameras were in constant use, all the best points in this beautiful district of hill and dale being visited. The visitors were under the guidance of Messrs. F. W. Williams, Alltree, Buddicom, Campbell-Hyslop, and M. J. Harding. At one o'clock the company wended their way to the premises of the Church Stretton Mineral Water Company at Cwm Dale Spring, to partake of luncheon, at the invitation of Mr. Arthur Hince, one of the proprietors of the Company. A large number availed themselves of Mr. Hince's hospitality. The Company's works were also open to inspection, and many of the visitors took advantage of the opportunity of seeing for themselves the manner in which the Stretton waters, which have obtained such world-wide repute, are prepared. The party were most courteously received by Mr. Hince and his staff. The works were in full operation, and the various processes of washing, filling, and labelling the thousands of bottles which are turned out of the premises every day were watched with considerable interest. The luncheon took place in the store-room, which had been most tastefully decorated for the occasion, and presented a very attractive appearance. Over 100 persons sat down. Ample justice having been done to the repast, Mr. F. W. Hindley rose, and said that he was sure they would all agree with him when he said that they would not be satisfied to leave the tables without expressing their very great thanks to the proprietors of the Stretton Mineral Water Company, Messrs. Hince, and the members of their family, for having entertained them so hospitably that day. Although they were only half way through the Shrewsbury meeting, he thought they had seen quite enough already to justify them in saying that it had been a great success; and that day's proceedings would certainly not be the least of the enjoyable events of the week. He was not a member of the Executive of the Convention, but he could not allow those present to depart without expressing, on his own behalf as well as theirs, his sincere thanks to Mr. Hince, not only for the splendid manner in which he had entertained them, but also for the satisfactory way in which he had managed the climatic arrangements. The water had not come down upon their heads, but they had been able to refresh themselves, with it, and most delightful it was.

Mr. G. W. Webster said he should like to endorse all that Mr Hindley had said as to the success of the Convention, and also as to the debt of gratitude they owed to Messrs. Hince for entertaining them so liberally that day. The G. O. M. once said, "Remember Mitchelstown," but, when the members of the Convention met again he thought, they would say, "Remember Church Stretton."

Mr. A. Hince, in reply, said that he was very much obliged to the members for the hearty way in which they had thanked the Stretton Company. He hoped that they would enjoy their visit to Stretton, and that they would come again many times, if not as a Convention, individually, and if they did, and would call at the works, he should always be willing to give them a taste of the Stretton waters.

At the evening meeting Mr. F. R. Armitage read the following paper:—

THE CAMERA AS AN AID TO TECHNICAL INSTRUCTION, WITH SPECIAL REFERENCE TO PHOTO-MICROGRAPHY.

By F. R. Armytage, M.A.

A few years ago my attention was drawn to an interesting little work by a well-known London physician on the cultivation of the memory. The author pointed out that all memories were either eye or ear memories, and then proceeded to indicate some simple test by which we could ascertain for ourselves whether we the more easily retained impressions received through the eye or those received through the ear. I think you will find that most of you remember better what you see than what you hear, and this at once brings me to the question of what are known as object lessons. The value of such lessons is now, I believe, admitted by all who interest themselves in educational matters, and, in fact, object-lessons are in future to be obligatory in the lower standards in elementary schools. I do not intend to trouble you on this occasion with a long dissertation on object-lessons, but will confine my remarks to such illustrations as can be supplied by the aid of the camera in conjunction with the optical lantern, omitting all questions of book illustrations, although undoubtedly there are some text-books that owe much of their value to the accurate reproduction they contain of photographic images. When I was first engaged in organizing lectures in this county under the Technical Instruction Committee of the County Council, I was frequently asked for suitable lantern slides, and I experienced very great difficulty in obtaining what was required. The lecturers on geology, botany, and animal physiology were perhaps the most importunate, and, although several wholesale dealers issued catalogues of slides, these were mostly reproductions of woodcuts, all of which were more or less diagrammatic, and in some cases far from accurate. The lecturer on the principles of agriculture again would gladly have had the opportunity of showing, by means of the lantern, typical examples of the various breeds of sheep and horned stock, for which this island of ours is so justly celebrated. You can easily conceive the impression that would be made on the rustic mind by a photograph of the ram that had been sold for 200 guineas, and the valuable aid a series of such photographs would be in emphasising the points of the best examples of distinct breeds. Many similar cases will suggest themselves to you where what I may call illustrations with a local flavour would go further in conveying instruction than any amount of mere lecturing without such illustrations. Further, a series of slides, however carefully selected by one teacher, will by no means always suit the methods and illustrate the meaning of another of equal capacity, unless he is willing to sink all individuality and content himself with cramming in the lines of a stereotyped syllabus. This reminds me of another direction in which the camera might be employed by a teacher with good effect. The labour of making diagrams large enough for lecture-room purposes is very considerable, but small diagrams, about 17″ by 10″, can be made on a drawing board in a comparatively short time, and a score of lantern slides from such diagrams will not take up more room than a small book—a great advantage to lecturers who have to travel from place to place. I think I have said enough to establish the value of the optical lantern as an aid to technical instruction. I now propose to say a few words on what, till quite recently at least, was considered a very special branch of photography. With the title of this paper before you, I need hardly say that I refer to the co-operation of the camera with the microscope. You are probably aware that in most standard works on the microscope the illustrations have been obtained by the use of the camera lucida, sometimes, I am afraid, assisted by the imagination of the draughtsman. Our modern dry plates and films, however sensitive, have fortunately no imaginative powers, being free from the misleading influence of personal bias, and with suitable treatment they will give faithful images of the minutest organisms the eye can see under the microscope. I hope I am not claiming too much for photo-micrography, but I can recall instances where an observer has failed to see through the microscope details which required no effort to distinguish them on a print or lantern slide produced from a negative taken with the same objective and magnification. When I was first desirous of obtaining photo-micrographs I was warned that the process demanded elaborate and expensive apparatus and an

mount of skill which could only be acquired after the expenditure much time and the spoiling of many plates. There was, I have covered, an element of truth in the latter part of the statement, t I hope to show you to-night that, given a quarter-plate camera d such a microscope as is generally possessed by biological students, gatives can be obtained up to 1000 diameters, with which little ult can be found due to the imperfections of the apparatus, although am only too well aware that most of my negatives disclose a lament- le want of photographic skill which no mere apparatus, however stly, could supply. I now propose to show you the arrangement adopt, and I need scarcely say I shall be only too grateful for any ggestions and criticisms from any one who will be kind enough to dicate where and how improvements can be introduced. Before I so, I would like to supply what might be considered a serious nission. My remarks, so far, have referred almost exclusively to e scientific side of technical instruction. I cannot help thinking, owever, that the art masters in the numerous schools of art now und in almost every important town would find their work rendered sier by projecting on the screen well-composed pictures, either taken om the works of the great masters of painting, or reproductions of e camera work of the best photographic artists. Lectures on com- osition have, no doubt, frequently been illustrated by the aid of the antern, but I have never heard of the lantern being resorted to in a hool of art for the purpose of systematic instruction. I will now roceed to describe the apparatus I have before me. The foundation hich carries the optical parts is a mahogany board, 3 ft. 6 in. ng, 9 in. broad, and 1 in. thick. At one end you will notice kind of platform, 15½ inches in length, on which the camera placed, and fixed in suitable guides. There are also guides y means of which the microscope can be placed in a central osition without further adjustment. The illuminant I use is a nall Defries' safety oil lamp, of about seven candle power, and lines re carefully ruled on the surface of the board to ensure the lamp eing easily placed in its proper position, so that the centre of the ame and the axes of the microscope, when in an horizontal osition, and of the camera correspond. There are also two steel yes screwed into the foundation board, the purpose of which will be pparent hereafter when I come to the question of focussing. The amera is a quarter plate Instanto, by Messrs. E. and T. Underwood, f Birmingham. The front is fixed, the bellows, which is of the quare form, extending backwards. It is of good workmanship nd possesses the usual adjustments, but it would be equally erviceable for photo-micrography without the sliding fronts and the wing back. The reversing back, however, sometimes comes in useful. have drawn with a lead pencil two diagonals on the focussing creen, and from the centre struck a circle 2½ inches in diameter. t the centre I have cemented with Canada balsam a thin covering lass, and, in addition, smeared the ground glass with vaseline. The microscope is Beck's "Star" stand with coarse and fine focussing djustments, the latter being of an original pattern, peculiarly sensi- ive, and entirely free from any defect in the nature of traversing he object on the stage. The substage condenser is of the Abbé orm. When the lamp is in place I obtain a parallel beam of light ays by means of an ordinary bull's-eye condenser or "paralleliser," as Mr. Pringle very appropriately calls it, to distinguish it from the sub- tage condenser. The arrangement for focussing you will agree with me is simple, if it is nothing else, but I hope to convince you that it is perfectly efficient. In most instruments offered by commercial firms the final focussing is accomplished by means of a rod, with a milled head at one end and a pulley at the other, which is connected by a cord with a milled head of the fine adjustment of the microscope. This has been found in some cases, especially when high powers are used, to cause a most undesirable pull in one direction on the body of the instrument. It is true that this has been overcome by various contrivances which it is not necessary at present to describe; but I need hardly remind you that every additional piece of mechanism means additional expense. The focussing apparatus I hold in my hand consists of a large cork, bored so as just to fit tightly on the milled head of the fine adjustment, a common black-headed steel pen which runs into the cork and forms a lever, and a piece of soft twine which is loosely knotted round the head of the pin. The ends of the twine pass through the steel eyes to which I have already referred, and are thus carried backwards to the hands of the operator. I will now show you how I proceed when about to make an exposure. Having placed the lamp and the paralleliser in position, and noticed whether the beam of light covers the central line of the board, I place an object on the stage of the microscope and select a suitable objective. The object being focussed, the microscope is placed between the guides, and the eyepiece (which I almost invariably employ) is removed and the illumination adjusted. I am afraid many failures in photo-micrography are due to a want of knowledge as to the proper method of illuminating an object so as to obtain a critical image. By opening the iris diaphragm of the substage condenser to its full extent and racking the condenser until the back of the objective is flooded with light of equal intensity without any bars or crescent-shaped appearances a correct illumination can be obtained and the central position of the whole combination ensured. By now replacing the eyepiece and partially closing the iris until the image of the object to be photographed is sharply defined, the preliminary operations are completed. The focussing arrangement may now be fixed in its place, and the camera, with the bellows extended, inserted in the guides on the platform. If due care has been exercised, the object should appear roughly focussed on the ground glass. There will, however, be a space between the eyepiece of the microscope and the camera front, which must be closed. For this purpose I insert this tube in the camera front, and place a cap, turned like the tube in boxwood, over the eyepiece. There is still a small space left which may be covered with a piece of black cloth, and now everything is ready for the final focussing and the subsequent exposure. I generally use a watchmaker's glass for focussing, noticing when the pencil lines on the ground glass and the image of the object are both sharp. It would be out of place for me to recommend any particular plates or films, but, as it is advisable to use those that are isochromatic, your choice is somewhat limited. As a matter of fact, I use the slowest I can procure. There remain the questions of exposure, and when I first took up this work I was sorely puzzled by the advice, or want of advice, afforded by the standard works on photo-micrography. The rules given rather reminded me of the historical treatise on the snakes in Ireland—there are no rules as to exposure. However, at the risk of being reminded that "fools rush in where angels fear to tread," I will venture not to lay down a rule, but to tell you the rule by which I am guided. Using this seven-candle-power lamp, and Edwards's isochromatic medium plates, I find one second for every two diameters gives approximately a correct exposure. Nearly all my work has been done at 733 diameters, and the exposure I give is a full six minutes for that magnification. There are many questions respecting objectives and eyepieces on which I have not touched, my object having been to show, however imperfectly, how to obtain photo-micrographs with ordinary optical appliances of good quality; but, if there is any member of the Convention who wishes for further information, I shall be only too glad to assist him to the best of my ability.

A short discussion followed, and Mr. Armitage was heartily thanked for his paper.

The following paper was taken as read :—

PICTORIAL PHOTOGRAPHY: THE OLD AND THE NEW.

By Alfred Maskell, F.S.A.

The difference in the practice of pictorial photography of to-day, compared with that of, at the outside, ten years ago, is a radical one; that is, if I may be allowed to take as my standpoint the pictures exhibited at such an Exhibition as the Photographic Salon at the Dudley Gallery, which is avowedly devoted to pictorial photography only. And I think I am justified in taking this Exhibition as typical of photographic art at the present time, because the members of the Society by which it is organized, who are responsible for the selection of the exhibits, include amongst them a very large number (if, indeed, it might not be justifiable to say more than this) of the most prominent names in that part of photography which we have now to consider. Be this, however, as it may, it is to the influence which has been exercised by leading men at this Exhibition and the consequent result upon pictorial photography in general, that I wish my remarks to apply. At the same time I am well aware that in the vast fields covered by photography the influence cannot as yet be said to have extended universally. Even amongst the important body of photographers which I am now addressing there may be some, if not, indeed, many, who are quite unaware of the differences to which I shall allude. It is a fact—though somewhat a humiliating one—that the movement in the photographic world, the discussions and combats, the literature, exhibitions, and the names and work of our greatest exhibitors are not so widely and generally known as we sometimes fondly suppose them to be; not that they do not deserve so to be, but the world is large and the photographic microcosm, after all, but a small portion of it. Even amongst photographers themselves—and by these I mean all who go about armed with a Kodak of one sort or another—it is astonishing how restricted is the knowledge of men and doings, which, to some of us, are of the very highest importance. On a vessel in which I lately made a voyage of some weeks' duration there were no less than fifteen cameras amongst the passengers; but, to my surprise, not one amongst them

had ever visited or, I think, even heard of, the Dudley Gallery Salon, or the Exhibition of the Photographic Society, or had more than the vaguest idea that there existed some kind of journalism devoted to photography. I am obliged to make this early digression with a view of deprecating the feeling which may possibly exist, even amongst members of the Photographic Convention of the United Kingdom, that I am speaking to them of wholly imaginary things. But I think I am right in saying that there is a radical difference between pictorial photography as we nowadays strive to exercise it and that which answered to, or was considered to be the same thing, so little time ago as, say, eight or ten years. Artistic photography was then the term most generally used, because it was necessary to be assertive. I myself avoid the expression when I can, and we will assume that it is to be taken for granted.

Well, it may be said, in general terms, that the older style consisted in the production of what was called a perfect negative, from which a skilled mechanical printer could make any number of absolutely similar prints. The newer method implies, in great measure, a greater freedom or latitude in the printing frame, that is to say, in work done after the completion of the negative. Negatives are produced, from which the most skilled printer could make nothing; at any rate, what he would turn out would be very different from that which would be, as it may be said, adapted by the artist who had a particular effect in view. Of course, the term, *perfect negative*, is a relative one. The only true perfect negative is that one which is fitted to reproduce the feeling of the artist, and it may be technically as bad as possible. Sometimes, in fact, the original negative is not used, but is transformed into something else.

Pictorial photography, as it was, consisted in the use of a technically perfect negative, which produced as a print a uniform result or effect. As our ideas are now tending, the result is obtained by modifications of all kinds—by alteration and suppression—but, in order to keep the photographic character, by never adding any absolutely new matter.

In the earlier days the attention of every photographer was directed, in a more especial manner, towards discovering and utilising the technical range and limits of his craft. He was satisfied with the marvels which he produced by purely mechanical means, and, if the results appeared to him to be pictorial, it never entered into his mind to inquire whether art and mechanism might or might not be compatible. He allowed himself to be hampered by supposed necessities or *desiderata*, and considered as absolute defects what we look upon nowadays as advantages. In those times he was content to reproduce what he found, or what he placed, in front of his camera in a conventionally stereotyped fashion, a willing slave to chemical and optical laws, which he had no desire to divert from their fixed path. For him the application of scientific marvels overshadowed everything else; the work of his dark room was paramount in interest. Alchymist, chemist, or magician, he was a little of all these, and the triumph of triumphs to be achieved was the production of the perfect negative—clear, clean, brilliant, sharp, gradated in perfect steps from black to white—a thing of beauty in itself alone. The work of creation was accomplished when a print of equal vigour was the result, and there was but one method by which this was to be done, but one pattern to be made which should never differ from its fellows.

There was little or no scope for originality which was hampered by such restrictions; an inflexible regularity allowed no play to the individual. A monotonous level, limited to one standard for good or bad, resulted at our exhibitions, until in time the inevitable revolt arrived. Then, indeed, the purists and the rigid methodists cried scandal, and laughed aloud in their scorn; but the first sensation of righteous horror at an impious disregard of tradition and dogmatic teaching having abated, the pioneers of "the new movement" obtained at least a hearing and a following. What was most of all derided at first, has become, in fact, a principle which is now little short of absolute law.

It was true, but a very few years back, to say that the characteristic of a photograph was such-and-such. This was easy to define; it was a fixed and apparently an immovable characteristic. But that no longer exists, and it has become, on the contrary, at certain of our exhibitions the fashion to look for the unexpected, for something which will reveal new capabilities and new possibilities in photography, rather than for the monotonous and decorous level of excellence which obtained for so long a time.

I have said that the characteristic of the older style of pictorial photography was the production of a perfect negative. Accepting this term as expressing one of the highest technical excellence—a standard which might be set by a man of science without any reference to other qualities—it may be said that the characteristic of the newer methods is the art of making spoilt or imperfect negatives. And truly a very difficult art it is; a far more difficult one than even in the days of the greatest obstacles was that of producing the typical negative of perfection; immeasurably more so in these days when our implements and material have been brought to the highest degree of excellence. The tendency in modern pictorial work is towards the alteration in every possible way of the results which the camera, used in the more mechanical fashion of days gone by, would produce. This alteration has been called *faking*, and I would now use the term hand work, were it not that the expression is one also liable to be misunderstood. But in any case I have no quarrel with the word *faking*, which has not, of necessity, a derogatory meaning. It is a method which we shall have to deal with more and more every day, and it is one which we shall have to accept. Broadly speaking the alteration of the mechanical work of the lens is the only door through which art can enter into photography. The question is, and will be, where the line is to be drawn; but, so long as you accept one kind, it is difficult to deny the right to use another. Has any one yet, for instance, found fault with the use of a painted background in a portrait studio, as unphotographic? And yet, the moment a background is introduced or modified by afterwork in the preparation of the print, an outcry is raised.

To return for a moment to the art of making spoilt negatives. The field opened up is enormous, for we may make them by defective focussing, by over or under-exposure in the negative or print, by movement of the camera or sitter, by using a pinhole or slit instead of a lens, by fogging the plate, and in numberless other ways. There was a picture by a prominent Salonist, which a distinguished scientific man said made him sick and giddy to look at; it was a spoilt negative because of the want of accurate definition. There was another of which some said that you could not tell whether they were onions or cabbage stalks in the foreground. It was a spoilt negative because it was badly focussed. Again, one of the best photographic portraits I have ever seen owes a great deal to the movement of the sitter during a long exposure. And many other examples might be adduced. Take any one of them with the aim in view of imitating the absolute effect of the result, and you will discover the difficulty of making spoilt negatives, and the art there is in it. Take especially the case of the movement of the sitter. There is a character and softness obtained by it which you cannot get by any other means. It is one of the most difficult to exercise and if you succeed in using it successfully, intelligently, I say you accomplish what is equivalent to good art, for which the machine is responsible only as a tool in your hands.

I will not go so far as to assert that the whole art of photography consists in producing prints differing from those which can be produced by the skilful scientific use of all the means which chemistry and optics accurately applied have placed in our hands, but I think the line which pictorial photography is taking is one wherein a great departure, at least, from the old standard, will give us indications of personal control, of individual power, of original procedure, of variety and novelty, of the art craft, in fact, of the worker.

Should the older method, which keeps more steadily to the unities, be encouraged? Yes, certainly; but from a different point of view, and we have a not altogether dissimilar position in the case of exhibitions organized for the encouragement and improvement of racial characteristics in animals, fruit, flowers, and vegetables. We have our Royal Agricultural Society and our Royal Botanical Society, and it is certainly of the greatest use to agriculture, to botany, and to fruit and flower culture that the most scientifically raised productions, however monstrous they may be, should be divided into classes and honoured with medals for excellence, medals for progress, firsts, seconds, and thirds, highly commended, and so on. But we all know that the prize pig or sheep, or the prize cabbage or carrot, the prize tulips or asparagus, even the prize grapes, however marvellous, are by no means the most excellent or palatable in themselves. Except for their special purpose they are almost useless, and the prize sheep is boiled down instead of being used as choice mutton. So, also, it is well that we should have exhibitions where medals should be awarded and distinctions made, even to the highly commended limit, for the most successful applications of the prize photograph. Only, it should be perfectly understood that they are what they are—gross, unwholesome, brutal, the raw material in fact, the *ne plus ultra* of mechanical ingenuity. They should not pose as refined productions appealing to cultivated taste.

It may be argued that my *simile* may be applied against my advocacy of what I have called the art of making spoilt negatives; that these show by their defects a want of culture which is as necessary in photography as in agriculture. But it is the culture of the heart which is required rather than that of the hard, unfeeling man of science, or the elaborate accuracy which distinguishes the mathematician. It is with such feelings that the advocacy of the



Morgan & Kidd, Richmond, S. V. *Negative by J. Laing, Shrewsbury.*

MEMBERS OF THE TENTH ANNUAL PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

HELD AT SHREWSBURY JULY 15-20, 1895.

THE
JOHN CRERAR
LIBRARY.

softer methods of photographic printing, in contradistinction to the garish obtrusiveness and the cold mechanical aspect of the highly polished surfaces which were at one time employed, has made so much way amongst us. It is the same feeling which has substituted a softer harmony for the minuteness of detail which was once so much the fashion. There is an admirable quality, no doubt, in accurate finish and mechanical precision, but there is another equally valuable which appeals more strongly to the indolence of our sensuous natures in the rough and bold inaccuracy which is characteristic, for instance, of the art of the eastern handicraftsman, and more or less, perhaps, of all our art crafts.

In the use of such expressions as the art of making spoilt negatives I have, perhaps, laid myself open to be misunderstood, and to have courted an easy and self-evident rejoinder; but, in what may appear to be an exaggeration of terms, there may yet be underlying a substratum of truth which is not too deep down for discovery. We shall not stand still in photography applied to pictorial art. We have begun to move, and one of the foremost amongst us who has watched, it may be said, the progress of art in photography from its cradle to our own time, has himself given the name "the new movement" to the present position. That, as I commenced by saying, there is a difference, and the difference a radical one, between pictorial photography, the new and the old, is certain. To have hinted at some of the features of both, and some only—for the field embraced is far too large a one to be covered at a stride—has been my purpose in the present paper.

The meeting concluded with the exhibition of a series of slides from negatives taken by members at Dublin and Leeds, the latter illustrating some of the places to be visited next year.

Friday, July 19.—Ludlow.

Under the leadership of Mr. H. P. Robinson, Mr. T. J. Salwey, and Mr. J. H. Williams, a party of about 140 journeyed by special train to Ludlow. Especial interest attached to the circumstance that Ludlow is Mr. Robinson's birthplace, and in the course of the day that gentleman did not spare himself in leading parties to the various beauty spots surrounding this inexpressibly lovely little town. The cathedral-like church, the picturesquely ruined castle, situated on a lofty hill dominating the town and the surrounding country, the Whitcliffe, an eminence which affords innumerable good views of the town, the castle, and the river below, were each visited by the party and very much photographic work done.

The Luncheon.

The Recorder of Ludlow (Mr. H. D. Greene, Q.C., M.P.) kindly invited the members of the Convention to meet the Mayor and Corporation of Ludlow at luncheon in the Town Hall, and about 170 sat down to a perfectly served repast, the nature of which may be indicated by the menu.

THE PHOTOGRAPHIC CONVENTION.

Shrewsbury 1895 Meeting.

(The Recorder of Ludlow.)

Menu.

Soup.

Clear Soup.

Fish.

Mayonnaise of Salmon and Cucumber.
Soles in Aspic.
Mayonnaise of Lobster.
Plain Lobster.
Dressed Crab.

Braized Tongue.
Boiled Chickens.
Roast Chickens.
Spiced Beef.
Roast Ribs of Beef.
Roast Lamb with Salads.
Lamb Cutlets in Aspic.
Pigeon Pies.
Veal and Ham Pies.
Fruit Pies.
Fruit, Cheese, and Butter.

Wines.

Champagne, Claret, Whisky, Ale, Lemonade, and Soda Water.

The toast list comprised "The Mayor and Corporation of Ludlow," given in a witty speech by Mr. Greene. The Mayor replied, and welcomed the members of the Convention to Ludlow. Mr. Haddon (the President) thanked his Worship, and proposed the health of Mr. Greene, remarking that there was nothing to be surprised at that at Shrewsbury (for which the learned gentleman is M.P.) he was not troubled with a contest. Mr. H. P. Robinson having also briefly spoken, the party adjourned to the town for the remainder of the afternoon, the return journey being made in the evening, everybody being delighted with the visit. The weather was beautiful.

At the evening meeting the following papers were read:—

INTERFERENCE-COLOUR PHOTOGRAPHY.

By R. Child Bayley.

In a paper read before another body a few weeks ago I gave particulars of the means by which photographs possessing colours due to interference could be obtained, and consequently do not propose to inflict upon you a repetition of the method to-night, more especially because I have on that point nothing new to relate. I propose to consider the results from a theoretical standpoint, and to discuss, rather, whether they fit in within any of the hypotheses in vogue.

Before doing that, however, I would allude to a point recently raised against my former paper in the editorial columns of The British Journal of Photography. The remarks made there are that the extremely fine emulsion "suggests a possibility which does not appear to have presented itself to him" (*i.e.* me), "that the transparency of the emulsion when it is poured on the glass is due to the fact that its constitutents have not had sufficient time to enter into combination." So far from this view not having presented itself to me, not only did it occur to me at the outset, but it has been presented to me by almost every one who has discussed the matter with me since. It did not take long, however, to see that the idea, while plausible enough at the first glance, was entirely erroneous.

It is, to my mind, inconceivable that two such soluble salts as potassium bromide and silver nitrate, when mixed with gelatine and emulsified, can be coated in the form of extremely thin films and then washed in running water for some considerable time, and still remain in the film. Some must wash out, and I have looked for precipitated silver bromide in the washing water, but none was present. If this were probable, it would still be highly improbable that a similar emulsion could be precipitated with alcohol, washed in running water, remelted and coated, and still retain the original amounts of silver nitrate and potassium bromide in an uncombined condition. I think The British Journal of Photography should give us some parallel case or cases where anything in the remotest degree resembling this occurs, before asking us to believe in such a phenomenon in this one instance. There are many chemical reactions which require an appreciable or even a prolonged length of time for their completion; but, if this case could be one of those, the reaction would be prevented by the removal of practically all of the salts by washing. As an additional proof, if any were required, I might point out that these films, if treated with solution of silver nitrate and developed without previous washing, fog, as might be expected, but, if the silver nitrate bath be omitted, do not, although, according to the hypothesis, they contain free silver nitrate in both cases.

As far as the opacity or otherwise of the emulsion acting as a guide to the coarseness or otherwise of the deposit, I can only repeat that, whether it be a reliable one or not, it has in my hands invariably acted as a true indicator.

The theory of the formation of these photographs in colours has been set forth by M. G. Lippmann himself (*Journal de Physique*, vol. iii. p. 97), and may be summarised as follows: The light falling upon the plate to a great extent passes through it to the reflecting surface of the mirror of mercury in contact with the sensitive surface, and is there reflected back upon itself. This reflection gives rise to interference phenomena in the sensitive medium, the result being the formation, in the case of monochromatic light, of a series of planes parallel with the face of the mirror in which the light is alternately at a maximum and at a minimum intensity. When the plate is developed we have a series of strata corresponding to these maxima and minima in which the deposit alternately is present and absent. When viewed, the deposit in such a film gives rise to interference, the result being that the colour of the light which gave rise to the image is seen by the observer. While there can be no doubt that these colours are due to interference, for the only other suggestion I have heard made as to their nature—that they are

green fog—is palpably absurd, so simple an explanation as that of M. Lippmann unfortunately does not account for, or even harmonise with, the facts of the case.

If this hypothesis is the correct one, that is, that the colours are due simply to the interference of light reflected from deposit in a series of planes, we ought, whether we view such a film from the back or from the front, to see the same colour, but this is by no means the case. Sometimes, but rarely, my results have shown identical colours from both sides, but much more often than not these have been different—widely different; in some cases the spectrum order has been entirely reversed. I am at a loss to account for this on the simple theory first set forth.

Again, the influence of the duration of exposure upon the colours is peculiar. I show to-night two photographs of the spectrum, taken with sunlight exposures, differing, as nearly as I could judge, in the proportions of one to five. That which had the shortest exposure is blue throughout almost its entire range; the other is nearly all yellowish-green. This difference is shown, but to a much less extent, in the two photographs, Nos. 1 and 2, the exposures of which were twenty minutes and half an hour respectively. Dr. Neuhauss has pointed out that with increased exposure the laminæ would get thicker and the distance between each one less, and that, on this supposition, the yellow should give place to green, green to blue, and so on; but this is precisely the opposite of what takes place, when the photographs are viewed from the glass side, although the hypothesis seems to be borne out when only the appearance on the film side is regarded. Still, as has just been mentioned, the colours on the film side being nearly always different from and frequently opposite to those seen from the glass side, and apparently rarely, if ever, even suggesting the colour which fell upon that part of the plate during exposure, they cannot be considered in any way as confirming the theory as to their formation, although bearing it out as regards this alteration with exposure.

The explanation I would offer, as to the reason of the difference in colour on viewing the two sides of the plate, is a simple one. When we regard the plate from the glass side we see the colours produced by the interference of the light reflected from a number of laminæ, formed, no doubt, in the way supposed by M. Lippmann. These laminæ, as they recede from the film surface and approach the glass, diminish both in density, and consequently in reflecting power, since the interference which caused them grew feebler as they receded from the mercurial mirror; that being so, the most opaque of the strata is at the back, and we can examine the colours produced by a number of reflecting surfaces less opaque which lie upon it. When we look at the film from the film side, however, we see the most opaque deposit first, the feebler strata are covered up by it, and cannot, when it is at all dense, be seen at all. What colour we perceive is due to interference between the lights reflected by this stratum and by the back surface of the film itself. In the case of short exposures this film is a thin one; possibly the exposure has been so short that it is the only stratum existing in the film, or at any rate they are not numerous and are feeble. These are the photographs in which we see both sides of the film the same colour. In the case of longer exposures this back film is thickened and the colour due to the interference of the light reflected from it and from the gelatine surface altered. That this is the case is shown by Dr. Neuhauss's experiment of removing some of the gelatine with leather dipped in alcohol, when the colours changed to those of shorter wave-length. This explanation appears to me to account for the difference in colour of the same photograph viewed from its two sides.

The great stumbling-block in the way of the production of photographs in colours by the process is, and must always be, the fact that the colours vary with varying exposures, since, as such is the case, it is quite easy to imagine some subject in which the relative intensities of two different colours is such that one of them is so much under or over-exposed as to produce the same colour as the other. It is to this we must look as the cause for the failures which seem, judging from the paucity of specimens, to be most often met with.

One word upon a practical detail. I have not been able to succeed in intensifying any of my own results with mercury; that is to say, the result, after treatment with mercury bichloride, followed by ammonia, by sodium sulphite, and by ferrous oxalate, has been the same as before—no feebler and no brighter. On the other hand, I have been successful in every attempt in intensifying with silver nitrate, reduced by means of acid pyrogallol solution. If not carried too far, this renders them much brighter and more vigorous, but does not alter their tint perceptibly.

Mr. Wall has favoured me with abstracts of two recent publications on the subject, to one of which, that of Dr. Neuhauss, I have already referred; these I will take the liberty, in conclusion, of reading.

Les Couleurs et La Photographie. By Niewenglowski & Ernault, p. 284.

Quite recently, at the meeting on December 21, 1894, of the Société Francaise de Physique, M. G. Lippmann proved irrefutably, once for all, that his chromo-photographic method is actually due to the formation of stationary waves. In fact, he has repeated in a very simple way the fundamental experiment of Otto Wiener, of the interference of two luminous waves rectilinearly polarised crossing each other at right angles. He allowed a parallel beam of light to fall on a sensitive film, without grain and of ordinary thickness, at an angle of 45 degrees. The plate was fixed, film outwards, on the hypothenuse of a right-angled isoceles triangle; the space between the prism and the plate was filled with benzine. The beam of light, falling normally on the incident face of the prism, underwent total reflection on the exterior surface of the film without needing a mercury mirror. As in the experiment of Wiener, the incident beam and the reflected interfered, but this time the beam was not monochromatic, a spectrum was formed. Moreover, it was previously polarised by traversing a Nicol prism, so that the sensitive plate received two spectra, side by side, the one arising from the beam of which the vibrations were parallel to the plane of incidence, the other of which the vibrations were in the plane of incidence. The first vibrations alone were capable of causing interference, and were, therefore, alone capable of forming a photograph in colours. After development and fixing, one spectrum alone was coloured—that arising from the beam polarised in the plane of incidence, in agreement with the ideas of Fresnel.

Die Photographie in Natürlichen Farben. By Neuhauss. Eder's *Jahrbuch*, 1895, p. 186.

He first points out that one of the conditions laid down for success is that the emulsion must be grainless, and that an emulsion prepared according to Lumière and Valentas' formula possesses a clearly visible grain before development, ·0001 to ·0003 mm. ($=\frac{1}{250000}$ inch to $\frac{3}{250000}$ inch), and as the half wave-length of light visible to the eye varies from .00019 to ·00038 mm., the grain has approximately the same size as a half-wave length. After development the grain measures ·0005 to ·0015 mm., and he states that before development the grain can be very clearly discerned under the microscope with an oil immersion objective and side illumination.

Neuhauss also points out that with varying exposures varying colours are obtained, and the variation of colour is in direct opposition to Zenker's and Wiener's theory, as the colours change from violet and blue to green, whereas it should be the other way, because one would assume that with longer exposures the intervals between the deposited layers of silver would get smaller, and should therefore reflect light of shorter wave-lengths.

Then, again, when one of these photographs in natural colours was rubbed with a leather dipped in alcohol, the colours changed; as the film was thus mechanically removed, light of shorter wave-length was reflected; thus red gave place to yellow. The contraction of the interstitial gelatine by the alcohol did not cause this, as, when the plate was laid in alcohol, no change of colour took place. Neuhauss is, as you all probably know, one of the foremost authorities on micrography, and he points out that, as we can resolve ampipleura pellucida into lines which are 0·00022 mm. apart, it would be possible, could a section be obtained of the film where red was reflected, to resolve this into layers, as they are only 0·00038 mm. apart.

After various suggestions and considerations, the author concludes by saying that these chromo-photographs are of two distinct kinds—one in which the colours can be seen from either film or glass side, the other only from the film side; the former he calls "Tiefenbilder," the latter "Ober flachenbilder," or body and surface pictures; the former only can be intensified with mercury, and the latter cannot.

PHOTOGRAPHY IN COLOURS.

By E. J. Wall.

The Committee appointed by your Council to obtain papers for this meeting of the Convention did me the honour of inviting me to read one on "something on photography and colour," as one of them put it. The only hesitation I had in acceding was caused by a feeling that there was little new to be said; but I hope, at least, there are one or two new points which possibly may not be known to you all.

I will first briefly sketch out the theory of photography in colours as applied first to printing, and, secondly, to projection.

We have here a spectrum, which we will assume we wish to reproduce in printer's ink. We take a negative, interposing somewhere before the plate a coloured screen which cuts out all the violet and all the blue, so that only the yellow, orange, and red rays

act on our plate. From this negative we make a printing surface, and, as you are all photographers, you can easily understand that this surface is used with blue ink, because the shadows in our negative which were formed by the blue rays produce the printing surface. In like manner we use a screen which cuts out the red, leaving the blue, green, and yellow, and from this negative we make a printing surface for red ink. Finally, we use a screen to cut out yellow, leaving the violet, blue, and red, and from this negative we make the surface to print in yellow. If from these printing surfaces we print first in yellow, then red, and then blue, we get our spectrum recomposed.

The first idea of three-colour work has always been hitherto ascribed to Collen, but in the 1895 *Jahrbuch* published recently by Dr. Eder, he points out that really the idea is due to Clerk Maxwell, who read a paper on May 17, 1861, before the Royal Institution on the theory of the three primary colours, in the course of which, after a description of the formation of white light by a triple lantern, using solutions of sulphocyanide of iron, cupric chloride, and ammoniated sulphate of copper, the following passage occurs:—"Three photographs of a coloured ribbon, taken through the three coloured solutions respectively, were introduced into the lantern, giving images representing the red, the green, and the blue parts separately, as they would be seen by each of Young's three sets of nerves separately. When these were superposed, a coloured image was seen, which, if the red and green images had been as fully photographed as the blue, would have been a truly coloured image of the ribbon. By finding photographic materials more sensitive to the less refrangible rays, the representation of the colours and objects might be greatly improved."

This is reported in full in THE BRITISH JOURNAL OF PHOTOGRAPHY for August 1, 1861, whence the above extract is taken.

Since our last meeting we can record one or two advances. The first is a great improvement in the quality of our printing ink. We can now obtain inks which very nearly satisfy the theoretical requirements—that is to say, they are as nearly as possible pure red, pure yellow, and pure blue. Samples of those inks I have here. It may be of interest to call your attention to one point, and that is, that objection may be taken to using three inks only, when lithographers actually use as many as eighteen sometimes; but I will pass round a specimen of chromo-xylography, showing the enormous number of tints to be obtained by merely using these three inks printed from one wood block turned round to a different position for each colour. I am indebted for this sample to Messrs. A. & B. Fleming, the makers of this ink.

Now for a practical hint learnt by a long series of failures. Should there be any one here who wishes to take up this subject, I would say, first of all, in the famous words of a well-known character, "Don't." It's simply heart-breaking work; still, if you do want to try it, then throw over the spectrum, and start, like Paddy, at the wrong end. First get your printing inks, and choose your screens to suit them. I have put into the form of a table the practical directions for working.

Screen.	Plate.	Printing Ink.
Red	Red sensitive ..	Blue.
Green	Yellow and green sensitive	Red.
Violet	Red sensitive ..	Yellow.

The axiom to remember is that every negative must represent two of your printing inks opaque, and the third transparent.

We now come to projection work, and I include here also transparency work of all kinds. To make three-colour projection slides is not so difficult. We use a deep reddish-orange screen, a dark green screen, and a deep blue screen. From the negatives thus obtained transparencies are made and projected on to a screen or by an instrument into the eye.

Putting the practical directions into tabular form, we have:—

Screen.	Plate.	Projection Screen.
Red	Red sensitive ..	Red.
Green	Green sensitive	Green.
Violet	Ordinary plate ..	Violet.

The axiom to remember is that one colour shall be opaque, the other two transparent—just the reverse to our printing-ink process.

I will now show you sketches of the different instruments which are used to project these into the eye. First of all, Nachet's stereochromoscope; and, secondly, Zink's photo-polychromoscope. Lately Ives has also introduced a stereoscopic heliochromoscope, in which practically two sets of everything are used.

We now come to the production of transparencies by another method, namely, by using the so-called carbon or pigment process. By this three transparencies in bichromated gelatine are prepared and then dyed, and we get the final result. These are also, of course, applicable to paper supports.

Those of you who were at Dublin last year will remember that Dr. Joly was, unfortunately, unable to show us any of his results, but he has been kind enough to send me one which you shall see presently, but I will first of all explain his theory and method of working, and, when you have seen it, I think you will wonder, as I did, that no one had thought of it before.

He takes a sheet of plate glass, and rules it with fine parallel lines, red, green, and violet, about 400 to the inch. This he call his negative screen, and it is placed in front and in contact with the sensitive surface of the plate. The result is that you get an image in lines, for through the red screen only the red rays emanating from

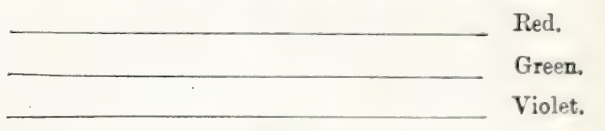


FIG. 1.

the object will act, through the green, only the green rays, and through the violet, only the violet rays. From such a negative a transparency is made, and this transparency is bound up with a screen ruled similarly to the first, and we get a result in colours. To show you this practically, I have taken three strips of glass—red, green, and violet. Assume this to be the negative glass. We shall get a negative like this if we take—

The spectrum as the subject photographed.

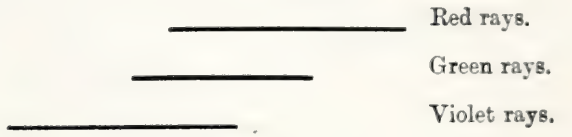


FIG. 2.

Our transparency will be represented, of course, by the reverse.

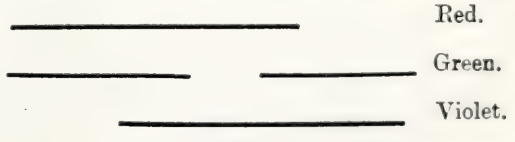


FIG. 3.

And by placing a ruled colour screen in front of this we naturally get the colours as you see here.

It must be understood that, although I speak of the red, green, and violet rays, in every case I mean the rays which may be generally classed under these names, because our red screen should let through the red, orange, and yellow, the green allows the yellow green and bright blue through, whilst the violet allows the deep blue and violet to pass.

Dr. Joly is now having a new ruling machine made, as his old one was not perfect, having what is technically known as a drunken screw, and as soon as he can turn out perfectly ruled screens they will be placed upon the market at such a price as to bring them within the reach of everybody, and, so far as I can see, every one can make his own photographs in natural colours, and there seems to me to be an enormous future in it.

M. Niewenglowski has invented another form of heliochromoscope, the advantage of which is that the amount of coloured lights can be varied at will. It consists of two boxes side by side, one only being shown here in section. The two sides, V V and R R, are open, and here the positions and coloured glasses are placed. At L is placed a prism, as in a stereoscope. P P is a bundle of glass plates for polarising the light, and A is an analyser, a Nicol prism, or a bundle of glass plates. By rotating the analyser the amount of coloured lights received by the eye of the observer placed at L varies till a correct representation is seen.

Nachet's Stereochromoscope.

In this instrument two positives and coloured screens are placed opposite the eyepiece and one below, the light being reflected through the latter by the mirror, and thence into the eyepiece by the glass, which is faintly platinised, so as to transmit the light, from the positives opposite the eyepiece, and yet reflect the rays from the lower positive.

Zink's Photo-polychromoscope.

This is, as you see, a box in three steps; at *a* is placed a red glass and the positive representing the red sensation. The light passing through these is reflected by the mirror, *d*, which is silvered on the surface to the eyepiece, *g*, and the eye, *h*. At *b* is placed the green glass and green sensation positive, and the light transmitted through these is reflected by the glass, *e*, which is quite plain, not silvered, to the eye. At *c* is placed the violet glass and the violet sensation positive, and the rays from this are reflected by the glass, *f*. The combination of these three simultaneously received images is perceived by the eye as though the coloured image were situated at *o*. It is obvious that the distances, *g f c*, *g e b*, and *g d a*, must all be equal. It is also obvious that, if the eyepiece were replaced by a lens of a focal length equal to *g f c*, this instrument might be used for taking negatives for this work if dark slides were fitted at *a*, *b*, and *c*.

Poly-photochromo Stereoscopic Camera.

This is suggested by Berthier in his little *Manuel de Photochrome*. *a* is a general view of the camera fitted with twin lenses, *b* shows one of the cameras in section, in which *p* is the plate sensitive to green, and p^1 the plate sensitive to blue, and *m* a mirror, which reflects the image transmitted by the lens simultaneous to its falling on *p*, the idea of this being that, as the plate is so much more sensitive to blue, the loss of light by this reflection will make up for this, and thus equalise the exposure. *c* is the second camera, and is used for obtaining the red sensation negative, the rays proceeding direct to the plate p^{11}, without let or hindrance, so as to compensate as far as possible for its lower sensitiveness.

Ives's Stereo-heliochromoscope.

I am unable to say much about this because, so far as I know, no description of the internal construction of this has been published, but Ives states that it is far simpler than his original heliochromoscope, although he uses two transparencies to represent each colour sensation.

[We regret the illustrations have not reached us.—Ed.]

Short discussions followed the above papers, and the authors received votes of thanks.

The Council Meeting.

After the reading of the papers a Council Meeting was held, which lasted till nearly midnight.

The principal business was the election of the President for the year 1896, and on the proposition of Mr. C. H. Bothamley, seconded by Mr. G. W. Webster, Mr. H. P. Robinson was unanimously elected President of the Photographic Convention of the United Kingdom for 1896.

Votes of thanks were passed to the Local Committee for their services, a warm and cordial compliment being paid to Mr. M. J. Harding, the local Hon. Secretary, whose self-sacrificing labours on behalf of the Convention contributed in a large degree to its success, and were highly appreciated by every single member attending the Convention.

Mr. R. P. Drage (Hon. Secretary), replying to a vote of thanks, drew attention to the heaviness of the work, and suggested that, for future meetings, assistance of some kind should be provided. The subject is to be brought up at an early meeting of the Council.

The report of the Sub-committee appointed to draw up regulations concerning grants in aid of original researches in photography, was presented, and its adoption moved by Mr. Bothamley. A long discussion ensued on a recommendation of the Sub-committee "that the receiver of a grant may at once publish the results of his investigation in any scientific or photographic journal of recognised standing, but must also present a full report on the work at the first subsequent meeting of the Convention." Several amendments, having for object the prevention of any one journal being given publication preference by the receiver of a grant, were moved without a definite result being arrived at, and finally the meeting stood adjourned.

On Saturday most of the members of the Convention dispersed, but others took short excursions till the afternoon.

"COSMOS" AT THE CONVENTION.

"Cheer up!" The Shrewsbury Convention will probably long be remembered for many happy reasons; but not one of them, I venture to say, will cling to the tendrils of the Conventioners' memories so firmly and so lovingly as the Convention cry, "Cheer up!" Yes, for the first time in its history, the Convention adopted (unofficially of course) a cry, which was also its motto, its watchword, its toast, its sign and countersign. Shrewsbury naturally had its Convention Belle, its Convention *Enfant Terrible*, its Convention fun, *contremps* and adventures; but these things, being conventional, are to be expected, and fail to excite surprise, however pleasurably (particularly in the case of the Terrible Infant) they may strike one. The Convention cry, on the other hand, appeared to touch a note of complete novelty and unexpectedness. It arrested everybody, it took hold of them, and, when they had got over their first smile of semi-amusement, they found themselves echoing the lilting admonition; and thus "Cheer up!" spread among the members of the Convention with almost electrical rapidity.

This is how it came about. The genial President, Mr. Haddon, in reading his address occasionally allowed himself to fall into a method of delivery and tone of voice not at all habitual with him and bordering somewhat on the funereal, whereupon somebody in the large audience murmured consolingly, *sotto voce*, "Cheer up!" and a smile passed round at the appropriateness of the advice. Then, later in the night, at one of those impromptu and hilarious entertainments known as Post-Convention meetings, that accomplished elocutionist, Mr. A. C. Baldwin, appeared, by the style of one of his recitations, to have left his usual fire and spirit in his portmanteau, and on returning to his seat was also sympathetically recommended to "Cheer up!" The look of surprise on Mr. Baldwin's face only helped to intensify the roar of laughter that broke out, and from that moment greater animation diffused itself throughout the gathering, the cry was taken up with unctuous gusto, and by early morning was Convention property.

"Cheer up!" fairly took the county of Shropshire by storm. At the festive board, at the solemn business meetings, at those feasts of reason and flows of soul without which no Convention is said to be complete it passed from mouth to mouth, backwards and forwards, in and out, and round about like quicksilver. In valley and dale, on the road and the river, in wood and dell, and on hill top, in brake and train, morning, noon, and night, it sounded and resounded. Stately and amiable mayors and town councillors and urbane M.P.'s, high and low, young and old, rich and poor, all received and returned the greeting, all took it smilingly and in good part, all welcomed and appreciated its sentiment. Like Mrs. Chickenstalker's muffins, "it came so pat." There was only one thing to regret in connexion with it, and that was, that it could not be photographed.

Success followed the Convention from beginning to end. The weather on the whole was good, what litttle rain there was not creating any real inconvenience. As a meeting place, Shrewsbury itself, abounding as it does in buildings of architectural and historical interest and variety, could not be bettered. Many of the visitors were somewhat amused at the curiosities of street nomenclature adopted in the hilly Severn-encircled Salopian capital—"Mardol," "Dogpole," "Shoplatch," "Wyle Cop," being names of the streets in which are to be found good specimens of the black and white roofed architecture peculiar to this part of the world. But I am not going to write about the architectural features of Shrewsbury and the other towns we visited during the week; that has already been done weeks ago by a pen better qualified to deal with the subject than is mine. My object is to place on record the opinion, that for the lover of the picturesque, the historical and the antiquated, Shropshire, with its old-world little towns, its ruined castles, stately halls, and lovely because thoroughly English scenery, is an ideal county.

The "stage management" of the Convention left nothing to be desired. Putting (if I may dare do so) Mr. Drage on one side for a

moment, I never came across a body of men who so throughly effaced themselves for the comfort, convenience, information, and entertainment of their guests as the members of the Shropshire Camera Club, ably led by the jovial and Napoleonic President, Mr. Williams, and the untiring Secretary, Mr. Harding. These gentlemen, with Mr. Laing, who took the group, Mr. Wallace Heath, Mr. Della Porta, Mr. Alltree, Mr. Pearce, Mr. Lawson, and Mr. Naunton, directed the excursions with such consummate care that they went without a hitch, good time being kept, and all the arrangements passing off smoothly and without friction or failure.

The hospitality extended to us during the week was of the freest and heartiest kind, and, no doubt, will have found due acknowledgment in another part of this JOURNAL. There is something intensely winsome, frank, and gentle in the bearing of the "proud Salopians" which at once captivates the stranger. The very children in the small villages are pleasant and courteous little folk, who will let you do what you like with them, photographically speaking. One little maid of eight or so, carrying a baby and accompanied by a four-year old brother, demurely posed for several of us with the utmost patience at the entrance to one of the valleys at Church Stretton, and as if she thoroughly enjoyed an ordeal which your small child of the south would have run away from. I watched her make for her mother's cottage, bursting with pride at having earned some sixpence or eightpence, and exulting over the newly acquired riches (two pence) of the baby in her arms. And so it was throughout all our experiences—courtesy, kindliness, welcome everywhere.

One of the most prominent figures of the Convention was Mr. H. P. Robinson, who entered into the spirit of the meeting with great heartiness, and gave and received photographic banter as if he enjoyed verbal fisticuffing as much as he does newspaper warfare. This is the kind of thing that went on through the week: "I've gone in for a hand camera at last," says Mr. Robinson; "but I'm taking many of my negatives out of focus." "All the better—for the Salon," was the reply. As a leader of the Ludlow excursion he was in his element, and was good enough not only to pilot us over what he calls, and believes to be, the most beautiful town in this world or any other, but to arrange for the clerk of the weather not to interfere with our photography. In return for these and other services he was chosen President of the Convention for next year. His selection will be very popular, and he will show his appreciation of the honour by not devoting his Presidential address to an art subject. He thinks science should form his theme, so he is going to discourse on *The Action of Acids on Mathematics.*

The papers read, excellent though they were, only excited languid attention, and certainly by the majority of those present, including many ladies, were simply endured as a matter of duty. Would it not be possible next year to fill the bill with at least one or two more popular and attractive items? I am pleading for those who don't, can't, or won't follow or understand comparatively abtruse subjects after a hard day's work in the country, and who form some of the oldest and firmest supporters of the Convention. By the way, it was a great pity that Mr. Maskell's paper could not be read. It contained material for an all-round squabble over a topic upon which anybody can say something that is foolish or amusing. Such a discussion, however profitless, would, after dreary and commonplace deliverances, like those most of us listen to dozens of times a year, have been a positive relief—a comedy after a tragedy, in fact.

While I am on the subject of discussions let me take the opportunity of saying that a feeling gained ground among many that far too much "talkee-talkee" was occasionally indulged in, and that not by the Shropshire men, who were all models of self-restraint and brevity. Some of us positively writhed under lengthened displays of oratory which wasted time and had not the redeeming features of being good or witty. I throw out the suggestion, that in future a time limit be agreed upon and adhered to. In, say, five minutes, an ordinary individual can talk just about a column of this journal, and I think that should be quite enough to give a man an opportunity of hearing the sound of his own voice, and other people of listening to it. I shall never forget a rebuke I once received for talking too much. There was a parrot——Stop! that's not the story. This is it: When I was a younger man I went to a City dinner. It was a good dinner, and in the middle of it I turned to my right-hand neighbour, a fat old alderman, and timidly ventured to remark, "This is a good dinner, Sir George." There was a long pause, and then, in a voice of thunder the old fellow replied, "Young man, I've come here to *eat* my dinner, not to *talk* about it." Moral: Obvious.

On the Ludlow excursion over 1000 exposures were made. The hand-camera men by no means had it all their own way; the large majority of members went in for serious work, the lordly 12×10 disputing it with the Lilliputian quarter-plate, so that a crop of good negatives will, it is to be hoped, ultimately result. Several ladies were photographing, among them Mrs. Naunton, of Shrewsbury (the "e" of which, by the way, is locally pronounced as "ō"), a most indefatigable mistress of camera work. The guide to the principal photographicable objects in the town, together with the hours at which the light was right, which Messrs. Adnitt & Naunton issued, was found of very great use and help by many members.

Mr. Haddon made an ideal President and was deservedly popular with the Conventioners and in the town. Mr. Mason's remark, that he was the right man in the right place, met with a round of applause from the London contingent, which said more than words how highly esteemed he is. Fame, however, travels slowly. Mr. Haddon was introduced to a gentleman, who asked if he (Mr. Haddon) was the Haddon of Haddon & Grundy? He did not know him otherwise. Seeing that Mr. Haddon's reputation as a photographic experimentalist was established when Mr. Grundy (who is still young) was a small boy, it is not to be wondered that the President smiled when he modestly replied that he was.

Of Mr. Drage's labours during the week little more need be said than that at the end of it they left him a physical wreck. He worked like a Trojan. Still, he has what I know he would regard as his best reward, and that is, the appreciation and thanks of every member of the Convention. Next year his labours will, it is to be hoped, be lightened. They certainly ought to be unless the Conventioners are anxious to kill him before his time.

The most photographed member of the Convention was probably Mr. Robinson. He bore it all with lamblike meekness. At Church Stretton we repaid the kindness of Mr. and Mrs. Hince and family in entertaining us by taking a group of them arranged by Mr. Robinson. Many were the recommendations to Mr. Wall, who focussed and exposed, to see that the picture was sharp, and not of a Salonic character. The Robinsonian umbrella hurtled through the air at one of the mockers, but nobody was hit, as might have been expected.

Mr. H. D. Greene, Q.C., M.P., put himself quite in perfect harmony with the Convention, and his hearty hospitality on the occasion of the Ludlow excursion will long be talked of. He dined us like princes, and he talked to us so pleasantly that we all felt that, if it ever became our lot to stand before him in his judicial capacity, he would let us down light. At Ludlow Castle, which swarmed with camera men early on Friday morning, he happened to get in the way of my picture, and, thinking him, at the distance, to be a fellow-Conventioner, I somewhat emphatically invoked him to disappear for a few moments. Subsequently discovering that I was addressing our host, I hastened to apologise for my peremptoriness, at which he good-humouredly smiled, saying that perhaps if he got in our way he would be immortalised. I assured him that he had already secured immortality without the aid of photography.

"Full report of the Photographic *Conviction!*" shouted out a small local newspaper boy outside the Convention headquarters one morning, whereat there was a roar of laughter.

Mr. Cembrano was only able to be present at the Convention dinner to receive the hand camera presented to him, in recognition of his former services as Secretary. Nobody grudged "F. P." his well-earned present, nobody could better deserve it. But many were the expressions of regret uttered, that friend Briginshaw, who bore the heat and burden of the first six meetings when the Convention had not yet emerged from the troubled period of juvenility and reached lusty adolescence, had been left out in the cold. He richly deserved something more than mere formal thanks, and it may comfort him in his neglect to know that troops of his old Convention friends entertain the very highest goodwill towards him for his past labours on their behalf.

I must confess that hitherto I was somewhat sceptical as to photography itself deriving any benefit from the Convention, but I am no longer in doubt on the point. The indirect gain must be very great. Aside of the opportunities the Convention affords of long sundered friends, rivals, and acquaintances meeting in the pursuit of a common object—that is, the peregrinatory prosecution of the beautiful Victorian art we all love so much—the official recognition of and welcome to the Convention tendered by the mayors, members of Parliament, local authorities and leading residents, must unquestionably take us several steps nearer the elevation of the status of professional photography, and thus help to impart to the profession increased dignity and importance. I have before urged, and shall continue to urge, professional photographers to attend Convention meetings on various grounds; and now, fortified with another reason derived from actual observation, I shall continue to advocate their adhesion to the P. C. U. K.

I can confidently state that the Convention left behind it a good impression wherever the members went in the fair county of Shropshire. Our guests were glad to see us; they were sorry to say goodbye to us. The leave-takings on Saturday morning were full of cordial good feeling on both sides, and many were the hopes expressed of one and all meeting at Leeds next year.

And so a well-spent and never-to-be-forgotten week came to an end, and the Shrewsbury Convention of 1895 was a thing of the past. Its joys and glories will, I am sure, be talked of for many a day to come. Not one cloud dimmed their brightness, not one speck tarnished or defaced them. I close these notes in the perfect seclusion of a little bay on the Welsh coast, and with sincere emotion I append to them the aspiration, *Floreat Salopia!* COSMOS.

News and Notes.

THE Annual Exhibition of the Hackney Photographic Society will be held at the Morley Hall, Hackney, on November 19, 20, and 21 next.

THE slides sent in for competition at the Aquarium Photographic Exhibition will be exhibited on a sheet twenty-seven feet square on Saturday, August 3, at three p.m.

MESSRS. E. BULLOCK & CO., Leamington, have sent us a charming portrait of a lady in all the colours of nature as a specimen of the coloured enamels (on paper) they are now introducing. Judging from the specimen, the process is an excellent one.

AN advertisement on our outer pages this week gives the names of the prize-winners in Messrs. Cadett & Neall's International Prize Competition. The pictures, together with those of the successful competitors in the recent Amateur Competition, will be exhibited at the Royal Aquarium from the 29th inst. until August 11.

THERE being, at present, little or no protection in the United States for photographs made and copyrighted in Great Britain, it is scarcely to be wondered at that Mr. Gambier Bolton's well-known series of animal studies has been seized upon, and many of the most striking ones scattered broadcast through America in tens of thousands in the shape of advertisements for beer, pills, soap, &c.; but it has been left to an enterprising Californian "artist in clothes" to describe the lion study he has coolly annexed (in the hope of pushing the sale of his thirty-dollar suits) as "one of the immortal Landseer's nest works."

MR. A. SEAMAN, of Chesterfield, who is one of the most indefatigable members of the Convention, is early in the field with views taken last week. He has sent us a fine stereoscopic picture of the large party which visited Ludlow and were so hospitably entertained at lunch by Mr. H. D. Greene. The picture represents the festive scene. The figures are well posed, well lighted, and sharp, and we recognise very many of them.

WE have seen some specimens of "Enlargements in Natural Colour" by a photo-chrome process invented by Mr. Hemery, sen., of Peckham. By the nature of the means employed, and which Mr. Hemery has explained to us in confidence, we believe that these colour pictures are not only permanent, but that there is no chance of losing the likeness, while the colouring is free from harsh and crude outlines. Our readers should obtain specimens.

IN the City Court, before the Lord Chief Justice, another case of obtaining money under false pretences was at hearing. The prisoner, Edward Morgan, was indicted for having, on May 11, falsely pretended to Mr. Joseph O'Sullivan, hotel proprietor, King-street, that he was the Comte de Hattenburg, and that he was the Chief Analytical Chemist to the London and North Western Railway Company, and that he was the proprietor of a laboratory at Crewe, and obtained by false pretences 5*l.* in money, and board and lodgings value 14*s.*, with intent to defraud. The prisoner, who was previously convicted in Glasgow for the larceny of platinum valued 51*l.* from the ironworks of Sir Wm. Arrol, was now sent to prison for twelve months with hard labour.—*Waterford Evening Herald.*

INTERNATIONAL PHOTOGRAPHIC EXHIBITION IN AMSTERDAM, SEPTEMBER 8-22, 1895.—His Excellency Knight J. W. M. Schorer, D.C.L., the Queen's High Commissioner in the Province of Northern Holland, has been joined to the Committee of this Exhibition as President of Honours. Her Majesty the Queen of the Netherlands, and Her Majesty the Queen Regent, have offered a medal of honour, as also have several other distinguished persons and corporations. According to the wishes expressed by first-class workers and editors, entry forms will be received till August 5 next. From all parts of the world contribution already is secured, and therefore we may say this Exhibition promises to become a very interesting and attractive one. Rules, regulations, and entry forms are forwarded by "Het Secretariaat der Internationale Foografie-Tentoonstelling, Handboogstraat 2, Amsterdam."

RECENT PATENT.

APPLICATION FOR PATENT.

No. 13,697.—"A New or Improved Camera for Photographic Purposes." C. OLIVER.—*Dated July*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

July.	Name of Society.	Subject.
29	North Middlesex	
29	Richmond	
30	Ashton-under-Lyne	Exc.: Marple Leader, John Andrew.
30	Birmingham Photo. Society	
30	Brixton and Clapham	*Mounting and Framing.*
30	Hackney	
30	Halifax Camera Club	
30	Lancaster	
30	Leith	
30	Paisley	
30	Rochester	
30	Warrington	
31	Burnley	
31	Croydon Camera Club	Photographic Chat.
31	Leytonstone	
31	Newton Heath	Social Meeting and Lantern Exhibition.
31	Oldham	Excursion: Bolsover and Hardwick Hall. Leader, J. Brooks.
31	Photographic Club	
31	Southport	*Artistic Mounting and Framing.* J. S. Dickin.
August.		
1	Birmingham Photo. Society	
1	Glossop Dale	
1	Hull	
1	London and Provincial	
1	Oldham	
1	Tunbridge Wells	
2	Brighton and Sussex	
2	Cardiff	
2	Croydon Microscopical	
2	Holborn	
2	Leamington	
2	Maidstone	
2	North Kent	
3	Hull	
3	Leytonstone	Ordinary Meeting.
3	Newton Heath	Excursion: Gawsworth.

Hackney Photographic Society.—July 16, Mr. R. Beckett presiding.—After the preliminary business had been completed, Mr. W. E. DEBENHAM read a paper on *Focussing with Non-aplanatic Lenses* [see next week]. At its close a discussion ensued.

West Surrey Photographic Society.—A meeting of this Society was held on Wednesday, July 17, to inaugurate the new meeting place at the Felix Institute, Lavender-hill, where facilities for a dark room have also been found. About fifty members and friends were present, among them being Mr. P. M. Thornton, M.P. Mr. G. H. SEWARD (Vice-President), in opening the proceedings, said that on that evening their meetings made a fresh start, that hitherto there had been nothing social about them, but that from that date the photographic and social divisions would unite, and he hoped the union would give happy results. Their principal objects were to increase the membership, rouse interest in the meetings of the Society, and rub down one another's angularities in the same way as pebbles on the shore, after falling rough from the cliffs, are smoothed by friction. He hoped the ladies, whom he was pleased to see present in such numbers, would be mainly instrumental in the smoothing process. He had great pleasure in welcoming among them Mr. Percy M. Thornton, and upon congratulating him upon his recent victory. He concluded by remarking that, although he differed from Mr. Thornton in politics, yet he was accustomed to look upon Mr. Thornton not so much as the representative of the party as of the interest of the borough. Mr. PERCY THORNTON, who upon rising received a warm applause, said he was heartily glad that his first public appearance was a non-political one, for, if he were to be always in the strife of party warfare, he would soon seek an opportunity of escape to fresh scenes. That he thought it to be the first duty of a representative to be not so much the mere member as to adequately represent all the interests of his constituency, and, in the case of a social evening, to be able to feel that he was at home there. He said he had that day had the pleasure of inspecting a fine collection of photographs (the property of the late Speaker) of the Houses of Parliament and the members of them as they appeared during the sixteenth and seventeenth centuries. In these the ruggedness of detail, both as regards individuals and buildings, was most noticeable, they presenting an appearance of unreality, and appearing quite unlike the same objects as they appear to us at the present day. In making group photographs of celebrities in any division of the athletic, golfing, or other worlds of interesting pursuits, it is photographs that were required for building up the picture. If, then, these photographs were unsatisfactory, the completed picture must fail to give a truthful impression of what was intended should be presented. Probably much that in the present day was worthy of preservation would be preserved for posterity by means of photography. Modern efforts showed a wonderful advance upon the older ones, the photographs he had just referred to appearing to have been designed by one with no artistic feelings. If photography was to be the method of preservation, then it was highly desirable that the process should be one that would be permanent. He then asked whether some of the photographs intended for competition were of a permanent character, and was answered in the affirmative. All artistic work produced by hand only, if of any value, must be highly paid for; but, in photography, they not only had artistic work of the highest character, but work which could be produced at most moderate rates. He apologised for his lack of technical knowledge, but said that a member of Parliament could atone for such a deficiency if he could take an interest in any meetings or objects he presided over when the subjects were unfamiliar to him. If it were not for photographs, he would be unable to bring back to memory the faces of many with whom he had been friendly in years gone by; that he thought that a collection of photographs inspected before a visit to that part of the country they represented much increased the pleasure and enjoyment of those scenes when actually visited. Social evenings were a great *desideratum* in London, and the making of friends, mutually improving conversation and intercourse, was of the highest value. Mr. Thornton concluded by referring to his unfortunate absence from the opening ceremony of the Felix Institute, and wished both the Photographic Society and the Institute every success. Mr. G. H. SEWARD, in a few remarks calling attention to the competing pictures, said he agreed with Burns that it was a good thing to be reviewed by a total stranger, as Mr. Thornton had expressed that he was in things photographic, as they were thus more likely to hear an unbiassed opinion of their merits; that it was usually the case, in referring to photographic work, that portraiture was placed on a higher level than the artistic side of the work, and that this, he ventured to think, was a mistake. In answer to the question of permanency of work, he could confidently assert that platinotype and carbon pictures possessed this quality; that photographs would in the future rank with paintings and other works of art, and would therefore need this particularly, and that what would most conduce to raise them to such high standing would be the merits they possessed judged as artistic productions. The awards for the best pictures taken at the Molesey and Hampton Court outing were taken by Messrs. Hoad and Price. Mr. Alban Stout presided at the piano, and gave a good selection during the evening. Mr. MacBride sang "The Distant Shore," Blumenthal's "Evening Song," and three or four other songs during the evening, which ended with a dance.

Photographic Society of Japan.—An Ordinary Meeting of the above-mentioned Society was held in the rooms of the Chigakukyokai (Geographical Society) Nishikonyacho, Kiobashi-ku, Tokyo, on Friday, June 14, at 5 p.m., Mr. C. D. West in the chair.—The minutes of the last meeting, having been printed in the *Japan Mail* and in the Japanese photographic periodicals, were taken as read. Mr. K. Ogura, who had recently returned from China, where he had been official photographer to the Japanese army during the recent war, showed some interesting results of his work. Mr. W. K. Burton showed a machine designed by Professor John Milne, F.R.S., of photographing animals—or thieves—in the dark. The slightest pull on bait attached to a thread, or the touching of a stretched cord, ignited a quantity—small or great, as might be considered desirable—of flashed powder, placed alongside a camera, and anything at the point of contact was photographed. The meeting ended with a vote of thanks to the Chairman.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE CONVENTION.

To the EDITOR.

SIR,—The Shrewsbury Convention is past; the meeting has been most successful. The members have been entertained regally, whilst enjoying the beauties of charming Salopia; and they leave Shrewsbury, full of happy memories of beautiful scenes, and of kindly hosts.

We were fortunate with regard to weather, and doubly fortunate in having all the arrangements so carefully planned by the executive branch of the reception committee (to whom all the success of the gathering is due), that everything worked without a hitch.

The Council have decided to present to the Mayors of Shrewsbury, Ludlow, and Bridgnorth, and to H. D. Greene Esq., M.P. (recorder of Ludlow), and also Arthur Hince, Esq., of Church Stretton, mounted photographs of the Official Group, taken at Shrewsbury, by Mr. James Laing.

It has also been suggested that, as some recognition of their kindly treatment in Shropshire, members might feel disposed to forward to the above gentlemen a few prints from some of the numerous negatives that have resulted from the excursions.—I am, yours, &c.,

R. P. DRAGE, *Hon. Sec.*

95, *Blenheim-crescent, London, W., July* 22, 1895.

SYSTEMS OF MARKING LENS APERTURES.

To the EDITOR.

SIR,—This subject, brought forward by "A. M. Z.," is certainly one of considerable interest, especially now that it can no longer be described as a difference between English and German methods.

If it can be conclusively shown that, to obtain the same amount of illumination with a compound lens, a smaller stop is required than with a single lens of the same focus, clearly, sooner or later, the distinction will have to be noticed, notwithstanding that probably few would find out the difference in actual work.

Taking the figures given as correct, a ratio of three to four between the two methods (measurement of an English lens marked on the new plan gave ratio of two to three), it would seem that what has been until recently the universal English method had the advantage of very closely compensating for the extra loss of light due to absorption and reflection in the case of the compound lens.

Scientific accuracy cannot be said to be very popular amongst photographers in this country, but many would certainly choose one maker's lens marked *f*-7·7 in preference to another marked *f*-10, yet identical in every other respect. (P. 416.)

That which seems most unsatisfactory about the new method of marking is that what has universally, until recently, indicated the actual size of the stop, is now to indicate the degree of illumination. Of course, it was supposed to do so before, and was found sufficiently accurate in practice; but would it not be better to have a new expression altogether, rather than interfere with one so well established?

The difficulty might be overcome by double marking, say, I-11, *f*-14, which would show that, whilst the stop was *f*-14, the intensity was I-11.

Your proposed article upon this subject will, doubtless, be welcomed by many.—I am, yours, &c.,

J. STERRY.

GELATINO-CHLORIDE PAPER.

To the EDITOR.

SIR,—In reply to "A Photographer's Son," who, after using gelatine-chloride paper for nearly two years and now discards it because of double tones and yellowness of prints, I have used Ilford P.O.P. in very large quantities for three years, and have never come across the disadvantages maintained by him; in fact, my experience goes to prove that gelatino-chloride paper is far superior to albumen paper for ease of manipulation, permanency of results, &c. If my assertions are correct, and the editor can give his opinion after inspection of a batch of prints sent by this post (some of which having been exposed to strong sunlight for over a year), it stands to reason that the faults complained of by your correspondents do not lie with the paper but in the manipulation of the same, because, if it is possible for one photographer to obtain successful results with the paper, with the entire absence of all the faults mentioned by "A Photographer's Son," it is possible for all to do so, and I certainly think to condemn a process because one is unable to properly work it is both stupid and unjust. A gentleman in the profession wrote me as follows the other day: "I have seen some prints of yours, which I

greatly admire; would you mind letting me know on what paper they are printed. I have used Ilford P.O.P. and cannot say I like it at all."

As the prints were on Ilford P.O.P., further comment is needless.—I am, yours, &c., ANTHONY PERCIVAL.

88, *Edgware-road, W., July* 22, 1895.

[The prints sent are excellent.—ED.]

PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—The Committee of the Photographers' Copyright Union instruct me to point out an error in your very interesting leading article, *Another Successful Copyright Action*, which appeared in your issue, July 19. You state that "the thanks of photographers are due both to Mr. Ellis and Mr. Gambier Bolton for the battles they have fought." This my Committee quite endorse. You further add, "they have done without the aid of a Copyright Union." It is this assertion that is erroneous. The action, Ellis *versus The Ludgate Monthly*, was fought and successfully carried through under the auspices of the Photographers' Copyright Union.

In Mr. Ellis's previous action, at the time of its commencement he was not a member of the Union. The same is also true as to Mr. Gambier Bolton, but. immediately on this latter gentleman joining the Union, it obtained for him substantial damages without carrying the case into Court. Your kind rectification of this error will much oblige.—I am, yours, &c., HENRY GOWER, *Secretary.*

July 20, 1895. (*For the Committee.*)

To the EDITOR.

SIR,—Will you kindly allow me to correct the statement in your article on Ellis *versus* Marshall, that I have "successfully brought this action without the aid of the Photographers' Copyright Union."

My first action against the *Ludgate Magazine* was commenced before the formation of the Union, but the second one, tried before Mr. Justice Charles on July 12, was in conjunction with the Copyright Union, and conducted by their solicitors, Messrs. Neish, Howell, & Macfarline.—I am, yours, &c., ALFRED ELLIS.

20, *Upper Baker-street, July* 23, 1895.

[We are happy to insert the foregoing correction, and are pleased to congratulate the Copyright Union on the successful part it bore in the action.—ED.]

To the EDITOR.

SIR,—We should feel obliged if you would make known in your valuable paper that, at a meeting of the Committee of the Photographers' Copyright Union, it was decided to invite the adhesion of amateurs to the Union.

The Committee have heard that there is a decided wish on the part of many to join. Undoubtedly the interests of amateurs in copyrights need protection as much as the professionals. Now that reproduction of photographs can be so cheaply and successfully made by the various processes, the copyrights of clever photographic studies have an undoubted money value.

The annual subscription is 10*s.* 6*d.*, and membership gives the right to the advice and assistance of the solicitors of the Union without any charge. Applications for membership should be addressed, The Secretary, Photographers' Copyright Union, London Chamber of Commerce, Eastcheap, E.C.—I am, yours, &c., HENRY GOWER, *Secretary.*

July 20, 1895. (*For the Committee.*)

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, diamond cushion safety, good condition, in exchange for quarter-plate "Le Merveilleux" and 10*s.* cash.—Address, A. G. SILVESTER, c/o. H. R. White, Esq., Moseley-road, Birmingham.

Will exchange Seavey's rustic bridge, boat and oar, 12×10 view lens, last ten years of THE BRITISH JOURNAL OF PHOTOGRAPHY, for rapid rectilinear lens, by good maker, whole-plate camera with double slides, or studio accessories.—Address, W. B., 78, Stoke-road, Guildford.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Alfred Freke, Cardiff.—*Three portraits of J. M. Maclean, M.P. for Cardiff.*

Frank Coghlan, Londonderry.—*Three portraits of Edmund Francis Vesey Knox, B.L.*

James Welch, Portsmouth.—*View of the interior of Well House, Carisbrooke Castle, Isle of Wight.*

Andrew Weber and Charles Peach, Bolton.—*Portraits of H. Shepherd Cross, M.P., and Colonel Hon. F. C. Bridgeman.*

William Lewis Shrubsole, Norwich.—*Groups of Sir Harry Bullard and Samuel Hoar, M.P.'s, for Norwich, with their wives and daughters.*

B. SMITH.—First dissolve the sulphite of soda in the water, and then add the other ingredients.

T. WELLS.—In making a ten per cent. stock solution of pyrogallic acid, the sulphite of soda should be dissolved before the pyro is dissolved.

A. SIMS.—Probably the trouble has been due to the hot weather. The water has been warm, and that has caused the gelatine to be so softened that, when it was squeegeed on to the plate, it became partially adhesive. Remedy: Either use colder water or alum the prints before they are put upon the plate.

C. A. C.—We expect that you permitted the sensitised tissue to lie exposed to the air, otherwise we cannot understand its becoming insoluble and unusable "inside of three days." As sent out, it can generally be depended upon for ten days or a fortnight. In winter it will remain good for three weeks or more if carefully kept; in summer not so long.

VELOX says: "I am about purchasing a pair of stereoscopic lenses, and beg to ask your advice as to which kind will be the most serviceable. I want a pair that I can use for general work, and also the most suitable for taking negatives that I can make lantern slides from as well as stereoscopic. Will the two following kinds do, or which is best, and which equivalent focus is best—4¾ inches, 5 inches, 5¼ inches, or 6 inches—first, rapid doublet, covering quarter-plate, working at *f*-6; second, Euryscope, covering 5×4, working *f*-6? A reply in your next issue will greatly oblige."—Either form of lens will do very well. A pair of about four and a half inches focus will be best for general purposes, as they will include, on a stereoscopic or lantern plate, about the same angle as is embraced on a whole-plate by a "rapid" constructed for that size, which is a very pleasing one.

*** Owing to pressure of Convention matter, several answers to correspondents and other communications are unavoidably held over till next week.

NOTICE.

With this number of the JOURNAL *is issued a half-tone illustration, by Messrs. Morgan & Kidd, Richmond, S. W., representing the members of the Tenth Annual Photographic Convention of the United Kingdom, assembled at Shrewsbury, on Wednesday, July* 17, 1895. *Mr. James Laing, of Shrewsbury, took the negative. A numbered key, with the names of the members, is also given, and we tender our best thanks to Mr. Martin J. Harding, of Shrewsbury, for his invaluable assistance in making the key complete.*

CONTENTS.

	PAGE
WHOLESALE DEVELOPING	465
THE TREATMENT OF GELATINE PRINTS	466
PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM	468
SOME POINTS IN CONNEXION WITH TONING AND FIXING GELATINO-CHLORIDE PRINTS. By C. H. BOTHAMLEY	468
THE CAMERA AS AN AID TO TECHNICAL INSTRUCTION, WITH SPECIAL REFERENCE TO PHOTO-MICROGRAPHY. By F. R. ARMYTAGE, M.A.	470
CONVENTION—*continued.*	PAGE
PICTORIAL PHOTOGRAPHY: THE OLD AND THE NEW. By ALFRED MASKELL, F.S.A.	471
INTERFERENCE-COLOUR PHOTOGRAPHY. By R. CHILD BAYLEY	473
PHOTOGRAPHY IN COLOURS. By E. J. WALL	474
"COSMOS" AT THE CONVENTION. By COSMOS	476
NEWS AND NOTES	478
RECENT PATENTS	478
MEETINGS OF SOCIETIES	478
CORRESPONDENCE	479
EXCHANGE COLUMN	480
ANSWERS TO CORRESPONDENTS	480

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1839. Vol. XLII.—AUGUST 2, 1895.

PREPARING DRY PLATES IN DAYLIGHT.

From the statistics of collodion supplied by makers and dealers, it is evident that it is being extensively used at the present time, mainly, we surmise, in connexion with one or another department of mechanical printing.

It may cause surprise, especially to our less experienced readers, if we inform them that it is possible to prepare plates, and, in fact, conduct collodion process operations, out in the daylight, in all but what we may regard as a final finishing touch, which must be given the plates in a dark room. We have been examining some prints from negatives taken in the way we are about to describe, and in no respect whatever, save in being slower in action than gelatine plates, and, in consequence, requiring a longer exposure, are they in any wise inferior to the best of these as regards the quality of the results capable of being produced.

The principles underlying the method just about to be described were first discovered by Poitevin, who had said, when speaking of the chemical effects of light, that, in order that light may reduce any substance, it ought to be in contact or mixed with another having the power of absorbing the lost element, and of forming a compound more stable to the action of light than the first. He had also stated that light exercised no action upon iodide of silver, chemically pure and isolated from any substance having the power of absorbing the free iodine which the light had a tendency to set free from it.

Of these substances, tannin is the one with which we, and, we think, most, old experimentalists have the most intimate acquaintance in this direction, although it is known that numerous other substances act in like manner. For instance, Mr. R. H. Bow, when the subject was brought under the notice of the Edinburgh Society when that body bristled with experimentalists, had found that not only tannin, but almost any one of the substances at that time employed as preservative agents acted as a sensitiser to the iodide, and he called special attention to the fact that he had also found protosulphate of iron answer the purpose admirably.

To apply these principles to the practical operation of preparing a collodion plate in daylight, the first thing, of course, is to provide oneself with a bottle of iodised or bromo-iodised collodion, and a vertical bath nearly filled with a thirty-five grain solution of nitrate of silver. The following operations may be conducted out in the open; ours almost invariably took place in the garden. The plate, having been previously made clean, receives a coating of collodion, and is immersed in the nitrate of silver bath for not less than a couple of minutes. It is now transferred to a bath of water to effect the removal of a large portion of the silver nitrate solution, and thereafter placed in a solution of iodide of potassium. This will convert the last traces of nitrate of silver into the iodide of silver. The strength of the iodide of potassium need not be great. Two or three grains per ounce of water have, we know, answered the purpose quite well. Chloride of sodium or bromide of potassium may be employed instead of the iodide spoken of. The plate now receives a thorough washing with plain water. Employing for this purpose the rose tap of a garden watering pan for about two minutes, we subsequently found it to be enough.

When the whole of the plates have been thus treated, they are reared up on end until dry, when they are taken in out of the light and kept in a plate box in readiness for the next operation, which is to render them sensitive, for up to this stage they are unaffected even by a strong light.

We have said that tannin (*inter alia*) is the sensitiser. The application of this is the only part of the process that need be done in the dark room, and the room need not by any means be so dark as it is required to be when working with gelatine dry plates, the collodion plates being much less sensitive.

The tannin solution may be a fifteen-grain one, and it may be poured off and on the collodionised surface of the glass plate. The immersion of the plate in a bath of the tannin is a more elegant and more convenient way of making the application. No special time can be recommended for immersion. We have had them immersed for various periods, from less than one minute to more than twice that time, and did not discover any difference.

After being dried, the plates will keep well for several days, but it is always desirable to expose them as soon as possible. We have known instances of good negatives having been obtained a month after the preparation of the plates, but we are uncertain as to the duration of the time tannin plates may be relied on for keeping in a reliably good condition, for at the time this process was practised each man had to prepare them for himself, which he did immediately prior to starting on a tour. One thing that may be said about them is that, if slow, they yielded negatives remarkable for their fine gradation, being in this respect not inferior to those gelatine ones of modern make.

They must be developed by the acid method, that is to say, the developer that is poured over the surface consists of a

three-grain solution of pyrogallic acid containing two grains of citric acid and two or three drops of a thirty-grain solution of silver nitrate per ounce, this latter being added just previously to development. If great intensity is desired, the proportion of silver should be increased. This may be found necessary when copying an engraving, especially if such be intended for phototype purposes; but for ordinary landscape work this kind of intensification will scarcely ever be required.

If the collodion contain bromide to any extent, alkaline development may be had recourse to, in which case the camera exposure may be greatly abbreviated. The greatest rapidity we have as yet been able to attain with a dry plate preserved by tannin has been equal to that got by a wet-collodion plate developed by ferrous sulphate. If, instead of citric acid, acetic acid is used in the developer, the image will be a rich non-actinic brown colour instead of black.

THE BATTLE OF THE BATHS.

The paper which was read by Mr. C. H. Bothamley at the Photographic Convention (see page 468, *ante*) is a valuable one, as showing what takes place, or may or may not do so, in the combined fixing and toning bath. That paper should be read, and considered, by all workers with emulsion papers, whether gelatine or collodion, and especially by those who employ the combined bath; and that, by the way, is now being recommended for some foreign brands of the latter paper. The author of the paper assumes, and with him every one will agree, that a combined bath, if it will give results as permanent as those obtainable when separate toning and fixing baths are employed, would be a great convenience. It is mainly the advantage of the single bath involving less labour that has led to its being so largely used, especially by amateurs. There is, however, another reason for its employment beyond the mere matter of convenience, which is this, with the combined bath, with some papers, certain tones are more readily obtained than when separate baths are used.

The question has frequently been asked as to the parts that acid, alum, and lead play in the combined bath, and no very explicit and satisfactory answer has been forthcoming. It is these particular points that Mr. Bothamley deals with in his able paper. He explains that, if a gelatino-chloride print be immersed in an acid solution of hyposulphite of soda, or one containing alum—the same result is obtained in either case—the print is first fixed, and, if it then be washed and dried, it will be of the same red-brown as will be one that has been fixed in a neutral solution of hyposulphite of soda; but, if instead of removing the print at this early stage it be left in the solution, it will assume precisely the same colour it would had it been toned with gold, although, of course, it contains no gold whatever. This fact by itself is valuable, as showing, contrary to the ideas of some, that, with "sulphur toning," fixing and toning do not go on simultaneously. The fixing takes place first, and the toning goes on afterwards.

Another important point is that no difference is noticeable between the toning action of a solution of hyposulphite which had been acidified—or alum added to it—for some time before use and one that has only just been acidified.

It has been assumed by advocates of the combined bath that the solutions being mixed some days before use, and the sulphur being allowed to subside, was an advantage. It now, however, seems that this is not the case. There is no difference, sulphur toning taking place all the same.

With regard to the addition of lead, Mr. Bothamley finds that a solution of hyposulphite of soda, containing either the acetate or the nitrate of lead, first fixes the print, as does the acid solution, and then tones it to a colour that is indistinguishable from the tones yielded by gold. Although the tones obtained in the hypo and lead solution are similar to those yielded by the alum and hypo, or acid and hypo, they are not due to sulphur toning, because the solutions were quite neutral. An important thing in connexion with the use of lead is that prints toned in a bath containing it tenaciously hold some lead when finished. Even after they have been fixed in a second solution of hyposulphite of soda, Mr. Bothamley says they still contain sufficient to cause, in time, a discolouration of the paper.

The conclusion arrived at by Mr. Bothamley is certainly not favourable to the combined bath, and for the following reason, the danger of lead remaining in the paper, which is therefore liable to become discoloured; that the use of lead salts, alum, or acids, should be avoided, because any one of them will tone a print to a colour that is indistinguishable from that produced with gold, although none of the precious metal whatever may have been deposited. Hence there is no certainty with the combined bath as to whether the tones are due to gold, sulphur, or lead, or to an admixture of the three materials. Short washing is generally recommended with gelatino-chloride papers; but, if the conclusions set forth in the paper read at the Convention be correct, a considerable proportion of lead must, under those conditions, necessarily remain in the print, even if there be a good deposit of gold on the image, which may ultimately cause discolouration of the whites of the picture. During the discussion on the paper, Mr. J. B. B. Wellington, who is an advocate of the combined bath, mentioned that he has been making some experiments in a new direction with it. Details of them will, we are sure, be received with interest.

Prints on albumen paper, made three or four decades ago, are often cited to prove that the combined bath yielded permanent results. So it did, as well as a very large number that were not; but, as we have before pointed out, the bath used then was widely different from that now employed. It contained neither alum nor lead. It was simply water, hyposulphite of soda, and chloride of gold. The toning action, while the bath was new, was due to gold and nothing else; but the bath was generally used continuously, and, when it was old, it would yield fine tones, even when the gold was quite exhausted. Hence there was the same uncertainty then as Mr. Bothamley points out is the case with the combined bath of the present day, namely, that there is no dependence to be placed upon whether the prints are toned with gold or whether they are not.

Chloride of Gold.—The recently issued proceedings of the Chemical Society contained two interesting papers on the physical properties of chloride of gold. They show that the salt is volatile at so low a temperature as 180° C.

Sensitiveness of Silver Sulphide.—M. H. Rigollot in a paper read before the French Academy of Sciences, Paris, has shown that, in using silver sulphide as an electro-chemical actinometer, its sensitiveness to infra red rays has been recognised

far beyond the last visible radiations, though it is suggested that the calorific action of the radiations may have some influence on the indications.

Lantern Companion for Astronomical Teaching.—In giving object-lessons on the positions and names of the various star groups, the use of a map greatly facilitates the teacher's work, but the difficulty naturally arises that the map cannot easily be seen. The *Scientific American* describes an excellent apparatus for overcoming the difficulty. An elementary lamp or lantern is constructed with one side removable, so as to permit the insertion of a series of glass transparences of star maps. The lantern can be carried about and used to exhibit the particular group the lecturer is describing, and so render the work of identification far easier.

Photographic Veracity *v.* Editorial Invention.—Though photographic evidence—very suitably on one occasion during the progress of the great "Tichborne case"—has received severe animadversions from the Bench, there are many cases when it is of real service. A case in point appears in the recently issued report of the Epping Forest Committee. Severe comments have been made in the public press, of late, upon the action of the commissioners in destroying the natural wild beauty of this favourite resort of the lovers of sylvan nature; one paper has given a series of pictures, illustrating the above point of view. These illustrations appearing unjust in the eyes of the commissioners, that body has given photographic reproductions of them in their report, and side by side some photographs taken direct of the same spot, within two days of the appearance of the illustrated paper's views. They felt quite confident of the effect of the comparison being an entire justification of the course they have taken.

FOCUSSING WITH NON-APLANATIC LENSES.

[Hackney Photographic Society.]

Some few years since, Mr. W. K. Burton, in calling attention to the fact that with certain lenses the insertion of a stop altered their focal length, advised that the focussing should be done with the diaphragm that was to be actually employed when taking the picture. The convenience, however, of having plenty of light to focus with is so great, that where the alteration of focus by changing the diaphragm is but slight, it may well happen that in some cases the risk of imperfect focussing, owing to deficiency of light, becomes more important than the slight alteration of the focal plane would be. This is a detail, upon which there have been, as may be expected, differences of opinion.

The cause of the alteration of focal length, or shifting of the focal plane of a lens, is the presence with it of what is known as spherical aberration. Where this exists, the rays collected by the margin of the lens are brought to a focus on a nearer plane than are those which pass through its centre. The eye judges the image to be in focus when the screen is placed nearly midway between the extremes of focal length given by different portions of the lens; but the larger area, and consequently greater luminous effect, of the parts of the lens near to the margin, has its result in causing the general image given by the entire lens to be nearer to that which would be given to the margin alone than it otherwise would be. When a stop is inserted so that the longer focussed central rays alone are left, the focus will be lengthened accordingly, and the image may appear to be even less sharp than before until the focus is re-adjusted.

A lens was introduced by Zentmayer, nearly thirty years since, in which this property of alteration of focal length by the insertion of a stop was utilised. It was a doublet, but composed of two single lenses of crown glass only, and was supposed by some to be the accomplishment of a seeming impossibility—the construction of an achromatic lens with glass of one kind only. The purchaser was directed to focus with the full aperture, *for convenience of light*, and then to insert the stop before exposure. As is well known, the more active chemical rays have a shorter focus than those which are most luminous, and therefore it is quite possible, with a lens having considerable spherical aberration, to so adjust the sizes of the two openings, that the visual focus with a larger opening shall be of the same length as what is called the chemical or actinic focus with the smaller one. In this connexion, however, it should be remembered that as we approach a truer rendering of nature by the help of orthochromatised plates and coloured screens, so the dependence on any system which brings rays of different colours to different foci becomes less satisfactory.

As the title of this paper is "Focussing with non-aplanatic lenses," it may be well to mention that "aplanatic" means "without spherical aberration," and that consequently the lenses referred to are those in which spherical aberration has not been overcome.

The inquiry may be made, Which are the lenses, if any, now in use, in which spherical aberration is present, in sufficient quantity, at all events, to call for any special attention to the subject? To this it may be replied, that it is present in nearly all lenses of really wide angle, the most recent examples constructed with more than four elements being perhaps the only exception. I will take the Concentric lens as an example. With a lens of this construction, having a focal length of eight inches, I found the focal plane was shifted one eighth of an inch when changing the stop from *f*-16 to *f*-32. I think that the want of recognition of this fact, and of the consequent correction, which is easily made, is the reason why it has not come into the large demand which its merits justify. The lens is the most perfectly free from astigmatism of any lens I have examined. It has also a remarkaby flat field, and the curvature favours a more equal illumination of the margin, as compared with the centre of the field, than almost any other wide-angle lens. The definition, as must be expected with any lens having spherical aberration, is not fine with the largest opening *f*-16, but with *f*-32 it becomes so; and for large plates and ordinary subjects not required to be taken instantaneously, the stop should, with any lens, be as small as, or smaller than this, in order to get different planes into approximately good focus.

Once settle that on this account as small a stop as *f*-32 should be used, and I know of no lens that will give better, or hardly any as good, definition over a rather large area. Certainly, with all but the most modern lenses, the image will be better in focus over a flat field, and with much better definition, owing to freedom from astigmatism, than with, perhaps, any other instrument.

These advantages mentioned are not trifling either in character or degree, and any one who has once found that, after focussing the centre of his subject, he has not to alter the plane and sacrifice his central object in order to get a compromise that will leave his margin tolerable, will not easily be content to go back to instruments with which such sacrifices must be made. Flatness of field is the quality which has so long been a desideratum in photographic lenses. Now that we have got it, and other good qualities (freedom from astigmatism particularly) combined, let us see that we appreciate it.

I have spoken rather fully of the Concentric lens, because it was in a paper read before this Society, that I have seen it, most unjustly, as I consider, depreciated as an instrument only occasionally useful and over a narrow angle. I have here a 12 × 10 view, taken with an eight-inch Concentric, and, though the corners are not quite covered, they are nearly enough so to show that a rather wide angle is included, and the definition near the margin is better than could be obtained, so far as I know, with any other lens having the like aperture, *f*-32. Here is also a small negative of a map taken with the same instrument and stop, though I should have used a smaller stop had the instrument been supplied with one. This is a duplicate negative of one made for a distinguished cartographer and experimentalist in reproduction processes, and he expressed himself as highly pleased with the fine and uniform definition given.

This Concentric lens is, as may be inferred from what has been said, by no means the only instrument with which there is an advantage in focussing either with the stop to be actually used, or of shifting the focus an ascertained amount after changing the stop. I use an instrument sometimes for wide-angle pictures, by a maker whose reputation is second to none, with which, when using the smallest stop, I shift the focus about a quarter of an inch from that given by the largest aperture.

As it often happens that the light is inconveniently weak when endeavouring to focus with a small stop, it is of great advantage, when using lenses not truly aplanatic, to know the amount by which the focal plane is shifted when the diaphragm is changed. To ascertain what the amount is, focus, in a bright light, some object which can easily be distinguished. Twigs or leaves against the sky will be found to answer the required conditions. This should be done with the full, and with the smallest aperture, and the difference of distance from the screen, if any, noted. If this examination be made, not only will the necessary amount of correction be learned, but I think that there will be a considerable amount of surprise at finding with how many lenses there is an amount of spherical aberration present requiring this correction.

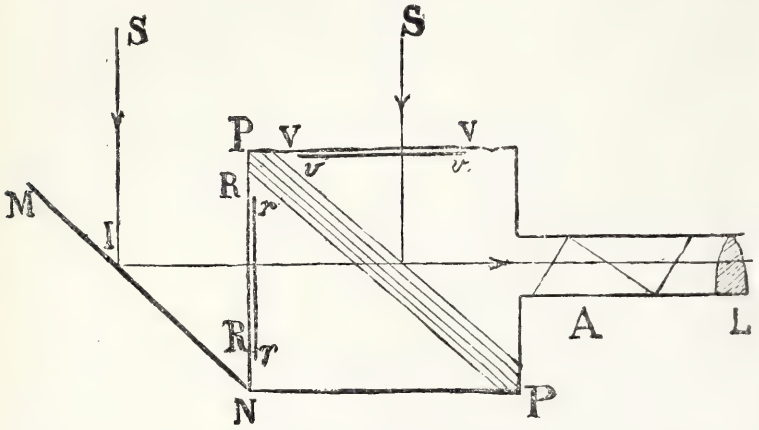
W. E. Debenham.

PHOTOGRAPHY IN COLOURS.

In order that Mr. Wall's paper, given in our last, may be made complete, we reproduce that portion of it relating to poly-chromoscopy, the illustrations for which did not reach us in time, and which will now be found below.

Niewenglowski's Heliochromoscope.

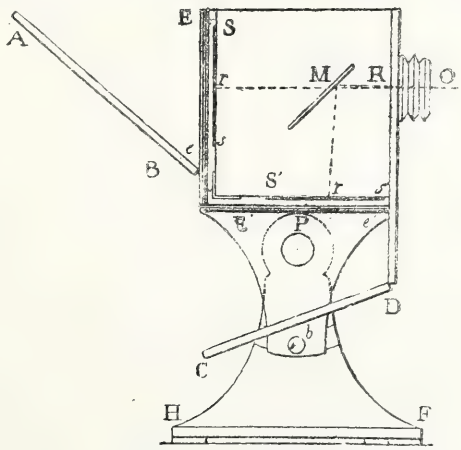
M. Niewenglowski has invented a form of heliochromoscope, the advantage of which is that the amount of coloured lights can be varied at will. It consists of two boxes side by side, one only being



shown here in section. The two sides, V V and R R, are open, and here the positions and coloured glasses are placed. At L is placed a prism, as in a stereoscope. P P is a bundle of glass plates for polarising the light, and A is an analyser, a Nicol prism, or a bundle of glass plates. By rotating the analyser the amount of coloured lights received by the eye of the observer placed at L varies till a correct representation is seen.

Nachet's Stereochromoscope.

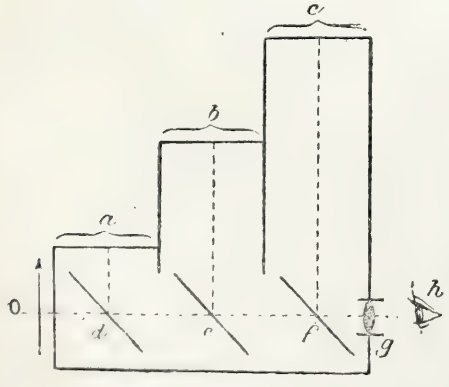
In this instrument two positives and coloured screens are placed opposite the eyepiece and one below, the light being reflected through



the latter by the mirror, and thence into the eyepiece by the glass, which is faintly platinised, so as to transmit the light, from the positives opposite the eyepiece, and yet reflect the rays from the lower positive.

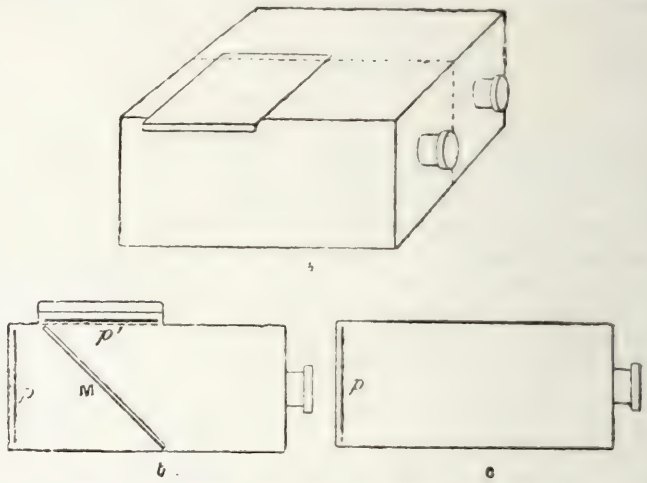
Zink's Photo-polychromoscope.

This is, as you see, a box in three steps; at *a* is placed a red glass and the positive representing the red sensation. The light passing through these is reflected by the mirror, *d*, which is silvered on the surface to the eyepiece, *g*, and the eye, *h*. At *b* is placed the green glass and green sensation positive, and the light transmitted through these is reflected by the glass, *e*, which is quite plain, not silvered, to the eye. At *c* is placed the violet glass and the violet sensation positive, and the rays from this are reflected by the glass, *f*. The combination of these three simultaneously received images is perceived by the eye as though the coloured image were situated at *o*. It is obvious that the distances, *g f c*, *g e b*, and *g d a*, must all be equal. It is also obvious that, if the eyepiece were replaced by a lens of a focal length equal to *g f c*, this instrument might be used for taking negatives for this work if dark slides were fitted at *a*, *b*, and *c*.



Poly-photochromo Stereoscopic Camera.

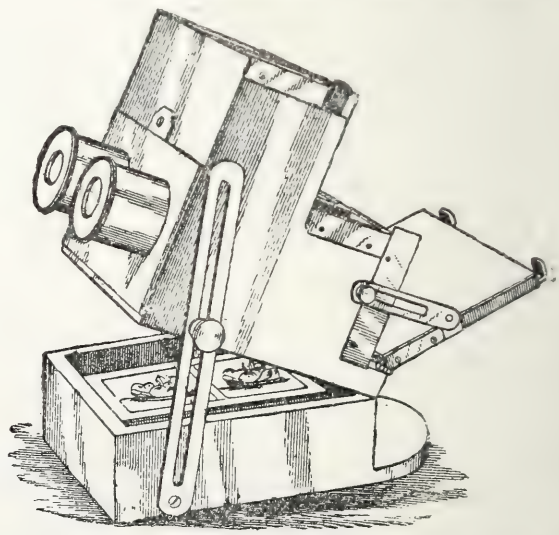
This is suggested by Berthier in his little *Manuel de Photochromé*. *a* is a general view of the camera fitted with twin lenses, *b* shows one of the cameras in section, in which *p* is the plate sensitive to green, and p^1 the plate sensitive to blue, and *m* a mirror, which reflects the image transmitted by the lens simultaneous to its falling



on *p*, the idea of this being that, as the plate is so much more sensitive to blue, the loss of light by this reflection will make up for this, and thus equalise the exposure. *c* is the second camera, and is used for obtaining the red sensation negative, the rays proceeding direct to the plate p^{11}, without let or hindrance, so as to compensate as far as possible for its lower sensitiveness.

Ives's Stereo-heliochromoscope.

I am unable to say much about this because, so far as I know, no description of the internal construction of this has been published,



but Ives states that it is far simpler than his original heliochromoscope, although he uses two transparencies to represent each colour sensation.

E. J. Wall.

SOME ASPECTS OF MODERN ILLUSTRATION.

[Royal Photographic Society.]

To-night I realise (as I never did before) that the task of delivering a sermon must be hardly less disagreeable than that of listening to it. And this difficulty lies chiefly in the fact that, as in a sermon, there are no new truths to put in a paper on *Illustration by Photographic Process*—that is, no truths that could be new to such an audience as this. It is a subject that is by no means devoid of novelty to the average layman. Indeed, not so long ago, I found a room full of public schoolboys (most difficult of all human beings to interest in aught partaining to art) quite

ready to listen patiently for nearly an hour. But to address members of the Royal Photographic Society on process work is as if a mild curate were attempting to instruct the whole bench of bishops in the first principles of theology.

For not only have the technicalties of the subject been thrashed out by experts often enough, all parties concerned having definitely decided who is to blame for the shortcomings of illustration to-day. The artist says it is the photo-engraver. The photo-engraver sometimes blames the artist, and sometimes the printer. The printer accuses the engraver. The editor blames everybody impartially—if a mildly benevolent person, he assures each in turn that it is the fault of the other; if of bellicose humour, he bristles with well-feigned indignation all round.

Meanwhile, the public appears to be perfectly indifferent to quality, so long as quantity is offered them, and cares very little whether a block be good or bad. Therefore, it is of little use to pour vials of wrath on the supposititious wicked man, who is always theoretically absent, since probably all here come under one of these heads. Nor would it be policy to offer myself as scapegoat, and, by rashly declaring that photography never was, had been, or could be, an art, to draw down vengeance on myself. This is a pity, because extreme statements are so easy and so exciting, while a judicial summary of evidence for or against interests nobody except the criminal; and, in the great case of illustrator *versus* process worker, one is never quite sure who is in the dock.

Again, it is hardly possible to stick to the text, and consider drawing for process step by step, in handbook fashion. I lack the courage, I confess, to read you out a list of materials and methods; to repeat once more the eternal verity, "Draw with solid black ink, upon smooth white paper;" to bid you shun Chinese white for high lights in half-tone work; to warn you, with all possible pathos, of the fatal results of using bluish ink with a half-exhausted pen; to describe scraper boards and added tints. Surely, by this time, we must assume every one here who is technically concerned has mastered these initial facts.

If, however, any are needed to refresh his memory on these points, or to have them misrepresented to him, so that he might rise later and slay the speaker, it would be better to turn to some of the many handbooks that explain the matter, or to those that confuse the subject as exhaustively as anybody could wish. What can any fresh speaker hope to add to Mr. Pennell's masterly volume, or to the monographs by Mr. Henry Blackburn, Mr. C. G. Harper, and Mr. Horsley Hinton, or even to one by a gentleman who shall be nameless, who has crowded more distortion of facts into a small illustrated manual than one had deemed any but a new journalist could have achieved in the given space?

Indeed, when your Secretary kindly did me the honour to request me to read a paper, I understood it was to be merely a little bone of contention for a discussion to follow. Then I thought for such a purpose it would be easy to boil down the facts from a chapter of a certain book, *Practical Designing*. But, looking into that book, it seemed to me that a selection from *Bradshaw's Railway Guide*, if nicely read, would be more exciting and charm you as fully; for it is hard to advance any cause by a speech in its favour. To attack is always pleasant, and defence is not without interest. But, concerning the process blocks, what is left to criticise and what is in artistic danger? I should feel like the workhouse chaplain, who addressed his safely folded flock on the folly of laying up treasure on earth, where moth and rust doth corrupt, and thieves break through and steal. Indeed, to address an audience of photographic artists on *the preparation of drawings* for process would be only possible if you had an ample exhibition of drawings, and a draughtsman, in full working order, to enliven the subject. One doubts if a paper of any practical subject, without accompanying illustrations, is of the least use. If it be art that really attracts you, you need the printed page, to retrace a paragraph at leisure, or skip a passage as it may happen, unless the subject itself is preserved to you by lantern slide, or in its actual reality.

So, to-night, may I take the old story of the handbooks as already told, and touch only upon a few aspects of the new movement in illustration, which seem to me of importance, although even here I fear I can claim no novelty of theme or thought.

First, have we fully yet realised the vital change that has come over the whole aspect of illustration? But a few years ago all artists' work in black and white (with the exception of that of a very few who drew and engraved their own blocks) was presented to the public through the paraphrase of another man's interpretation. Indeed, one might say with some truth that it was only in a mistranslation that they knew it for the most part.

Imagine that a score of years ago every item in a newspaper or periodical had been written in a foreign tongue, and hastily paraphrased for English readers by dull mechanical linguists, and you will have a fair parallel of popular illustration then. Now the artist speaks in his own tongue directly to his audience.

It may seem that to dismiss the details of drawing for process work as too familiar to need discussion, and then to turn to such an obvious fact as this, were still more futile.

But I think that to-day the very success of this great revolution in popular illustration is in danger of being accepted, like other common mercies, as a fact too ordinary to be worth our gratitude. Therefore, a few discontented people, who, having discovered some superb pictures in popular literature of the golden period of English wood-engraving, put them before you, and sigh for the wonderful past, and say there is "nothing like it to-day." Then you are supposed to heave a responsive sigh in return, and weep for those glorious days which the wicked camera has banished for ever. This is not a hypothetical case, but a sample of the attitude of many artists and laymen to-day.

It seems to me we shall do ourselves a great injustice if we permit a fallacy of this type to gradually assume the position of an accepted fact.

Have we nothing to-day as good as the illustrations by Walker, C. Pinwell, Millais, and the rest of the *Once-a-Week* school? I, for one, should be sorry to admit so much! Nor does it detract an iota from the reverence due to these great and too-much-neglected artists (neglected, I mean, so far as their black-and-white work is concerned) to claim for some of our younger men that they, in their own way, and with the idiom of to-day, are doing work no less worthy. It may be that in no current periodical can we find any illustration to fiction as good as those Sir John Millais drew for *Framley Parsonage*, or the *Small House at Allington* in the *Cornhill Magazine*.

If it were not straying from our subject, I think one might ask if any currrent fiction itself is as good as *Romola*, *The Cloister and the Hearth*, *Denis Duval*, *Philip*, and the rest of the novels of this particular period.

Therefore, if the case were to be judged upon a single item, both modern novelists and modern illustrators might be dismissed as second-rate. To do this, however, would be to confess unwittingly that we had lost the power of acquiring new impressions, and had accepted definitely one standard of excellence only to stand and fall by. If you turn to the criticism of this golden period, you will find it no less dissatisfied with itself, moaning for the glory of the Cruickshanks, and Hablot K. Brownes, the over-praised illustrators of Thackeray and Dickens, or even, as Mr. Ruskin once wrote, declaring that the whole art of illustration was dead and forgotten.

Now, it is a fact, that sons often "favour" (as old women put it) their grand-parents more than their parents, and, if our illustrators of to-day (which I for one would not admit) do not happen to do equal justice to sentimental fiction, who that is concerned with the technique of black-and-white or with accurate character study could say that Cruickshank, Phiz, or even Leech, showed the knowledge and achievement of Phil May, Grieffenhagen, Raven Hill, and dozens of others at home and abroad, that are to-day working directly for process, and have mastered its essential qualities. Only prejudice would insist that the older work was better in any way.

Nor, taking the best drawings which have been reproduced by process in our best periodicals, the fine architectural subjects by Joseph Pennell and other contemporary artists, the wealth of illustration that made the ever-to-be-regretted *Pall Mall Budget*, the "Once a Week" of its day, not to reckon the host of good things in French and American periodicals—taking all these, it would be a bold thing to say they do not equal the average of the illustrations of the sixties, even if they fail to surpass the best examples of a half a dozen of the older artists who worked with all the enthusiastic zeal of men bent on reviving a decayed art.

But if an argument to prove that drawings made with a view to their reproduction by process must needs be inferior to those made for their reproduction by wood-engraving could be carried through—and it is mere folly to assume that it could—even then to blame the camera for the result would be absurd. Who that has seen the superb drawings by Charles Keene, by Rossetti, by many of the older men, in their engraved versions, and then again in fine process blocks made from the originals, could hesitate for a second?

Indeed, to claim that the average engraver improved his original is slandering the artists, who were unluckily given no choice in the matter, but had to see their work cut about by a mechanic.

We may fairly take an optimistic view, I think, and decide that the gain is out of all proportion to the loss, for, if the best periodicals of the sixties were as good, or better, than those of to-day, what of their average stuff, and the illustrated journalism? To look over the file of the *Illustrated London News* of twenty years ago is a very great disillusion. Here and there its non-topical subjects, demanding quiet, leisurely preparation, are distinctly works of art, but the average page of *London Society*, *Bel-*

gravia, or the weekly illustrated papers and children's books at that time, are far worse in idea, in drawing, and in technique, than anything which the half-tone has substituted to-day.

One evil may be laid to the camera, namely, a craving for the journalism of pictures, the presentation of ephemeral scenes, and portraits of nobodies. It is an age of the interview and the reporter, and the Kodak has come to his aid, so that a new public takes the old interest in scandal and tittle-tattle; but, thanks to increased opportunities, its scandal-loving and gossip concern a nation of celebrities and nobodies instead of being limited to a parish.

Indeed, how far the wicked camera, backed by the photo-engraver, has fostered mediocrity into notoriety would be a very ungracious subject to discuss. It is amusing to note that the sworn foes of the photograph as art are very ready to welcome it as an advertising ally. But lately a fierce tirade against the pestilent half-tone block (which always aggravates the superior critic) was reported the next morning, accompanied by a portrait of the speaker reproduced from a photograph by the half-tone process. This triumph of fact over theory shows how hard it is to live up to abstract principles in daily life.

The second point I wish to touch upon is that the spread of photographs has influenced the critical perception of the average layman to an extent quite remarkable, and entirely routed the old canons of composition; this is another aspect of the case which, I think, has never yet been recognised to anything like its real extent.

In this respect it seems hardly possible to over-estimate the importance of the silent teaching of the photograph.

Nothing is more conspicuous in modern paintings, no less than in modern illustrations, than the abandonment of those artificially symmetrical compositions, which were so long deemed among the first principles of art. That Japan assisted in this revolution I have no doubt, but only artists were directly affected by Japanese art; the public taste was modified by the photograph, and by it alone.

If you turn to even the best work of the palmy days of the sixties, you will find as a rule (speaking of figure subjects) that fully half of the pictures were devoted to a single figure, or a couple of figures, set well in the centre of the drawing. You will there see the hero and heroine falling in love and falling out, saving each other's lives, holding each other's hands, greeting or parting, all like opera singers in the middle of the stage close to the footlights, well in evidence, and as regardless of the unconventional attitudes of real life as of the light and atmosphere of the common day.

Although in the work of masters this artificial arrangement was accomplished without undue distortion of fact, in the work of their followers it was painfully evident that the first object was to set the couple well in the fierce light that beats upon the studio throne, a light that most surely never shone on sea or land, but was kept for artistic consumption, and duly modified by north windows and screens. Turn to modern illustration, and you will find always an effort to be naturalistic—in the photographic sense—that is, an imitation of the accidental grouping of common life, in place of the arbitrary pose sacred to grand opera. To-day we find the figures half cut off by the frame, or playing almost secondary parts amid their surroundings. A chair back or a tree may usurp the important place, and human beings be no more always to the front than they are in the common order of things.

Now, this great change must have come about as much by the newly acquired knowledge of the public as by the conscious effort of the artist; or, to be more correct, its acceptance by the public can only be traced to the influence of the photograph, for, when they had become familiar with the natural arrangement the camera recorded, they were prepared to accept an artist's version of equally unsymmetrical effects. It is not quite easy to put this into words, but, as it is a very important point so far as concerns the influence of the camera on art, I trust you will pardon my dwelling on it for a moment.

The average person believes that when he looks at a thing he sees it. Indeed, to attempt to convince him otherwise were a hard task. All the same, his belief is a fallacy in nine cases out of ten. When he looks at a thing (so small is the circumference of actual vision), he sees only a very small part. Now, even if his eye be trained to observe all that is within the vignette which occupies the focus of his vision, he unconsciously selects certain details which most attract him. In a face, for instance, one feature, by its beauty or the reverse, rivets his attention; or, if looking at a view, he picks out a tree or a church spire, the flash of light on sparkling water, or the blue distance of the horizon.

To see more, he allows his gaze to wander across the landscape, or up and down the figure. The details he has caught in this sweeping glance he pieces together, so that his impression is as much mental as visual. And in this act of memory, automatic as it is, he unwittingly distorts things *in obedience to preconceived impressions of similar subjects portrayed on a smaller scale, from which he was able to take in the complete picture at a glance.*

If we select a closely parallel case, and examine the report of a conversation by one who has overheard it, we find its grammar, the inflexion of the voices of the speakers, all distorted to his own idea of grammar and elocution. If he be an uneducated person, he throws in "says he" and "says she" to distinguish the actors, and substitutes his own idioms, that well-bred people would never employ. Furthermore, he unconsciously selects those phrases and incidents that riveted themselves on his memory, and totally ignores the rest.

Now, this process is very similar to the untrained memory of a thing seen, and one exactly opposed to the record of the photograph or the phonograph, which, unless arbitrarily prevented, reports impartially all blemishes and blunders no less accurately than the attractive features or sounds. An artist (using the word in its strictest sense) is one whose faculties are trained to the highest degree, who, by instinctive genius, *plus* knowledge acquired by observation, can perceive a thousand facts of colour, form, or sound, when the man in the street is scarce conscious of half a dozen.

When the average man puts down his half-dozen facts, *plus* a few that exist only because he feels they ought to have been there, the hap-hazard result completes his record. The artist, in a highly trained unconscious memory, has a thousand to select from, and chooses the typical half dozen, which imply and suggest the existence of the rest. A photographer records them all. Thus, in a portrait of a face, as the antique man saw it before the photograph had come to influence him, he was satisfied with a few vague proportions and certain salient points—about as many as a political cartoonist puts in his portraits. If you take one of Helleu's dry point etchings, where no more lines are used than in the political cartoon, you find colour, modelling, expression, and movement so subtly suggested, that it is hard to realise that a bare outline, with scarcely any shading, could convey as much. A photograph will perhaps give you more modelling, more light and shade, but can hardly suggest colour and movement, or play of expression, and so fails to gain the largest truth, although it includes a large number of secondary facts.

Now, the average person a few years ago rarely saw a painting of the highest class, and based his mental pictures on the memory of those illustrations he was familiar with. The hackneyed lines of Browning—

> "We're made so, that we love
> First, when we see them painted, things we have passed
> Perhaps a hundred times, nor cared to see;
> And so they are better, painted—better to us,
> Which is the same thing. Art was given us for that."

Now, the average person certainly only sees in a landscape, or a figure subject, the pictorial qualities he has already learned from pictures.

Setting aside colour as not fully within the province of the camera at present, but keeping to illustration only, if we go back to the very finest work of past centuries, we shall be surprised, looking at it in comparison with photographs, to find how many objects were depicted by purely conventional symbols, hardly more literal in their portrayal of nature than the rayed disc was a realistic picture of the sun. This circle, with black radiating lines, was regarded, not as a symbol of the sun, but as a pictorial representation of the great orb, which is, or should be, the deity of photographers. For human portraits we find a black outline, with certain lines to represent features, was accepted as a complete portrait of a face. Now any half-tone block will give you the modelling and contours, then only presented in oil paintings or sculpture.

It would not be wise to reckon this added detail as unmixed gain, for the art of monochrome (lacking local colour as it must) has merely accepted so much convention in place of literalism, that it is quite an open question how far added detail is added beauty.

If your object be to identify a wandering Jabez, then a half-tone block in a penny paper will assist you more than a drawing by a Holbein, but, if it be a work of art you want, then a selection of the beauties of the face (supposing our restored Argentine hero has any) would certainly be more satisfactory to hang on our walls.

To return to the point, now that the public have at hand for immediate reference fairly accurate and very complete records of any given subject in monochrome, it is natural they should expect an artist to give them something more like it than is an outline drawing, or even a good pen-and-ink sketch. Hence, no doubt, the popularity of work in wash to-day as opposed to work in line. Indeed, before the process block had gained the mastery of the field, wood-engraving was doing its best to rival the delicate half-tones, the subtle modelling, and softened detail of

the best photographs. When people deplore wood-engraving to-day, you may be almost certain that it is the wood engraving in facsimile of pen drawing which they regret, not the so-called American school which was bent on imitating brush work. So, when they deplore the irruption of the photo block, it is again the half-tone they really dislike. No one can say that the really superior line drawings of Mr. Joseph Pennell, a past master of the art of drawing for process, of a Vierge, of a Phil May, or a Raven Hill, would be improved by being engraved on wood. In the hands of a very fine engraver, one here and there might give a better result by rapid printing, but the delicacy of the nervous unequal line would be lost. But great engravers demand great prices, and are not to be made to order in the required quantity any more than great artists; consequently, were the process block banished, ninety-nine hundredths of good illustrations must go too, for the average wood-engraver, who must needs be trusted to supply so large a majority of the blocks, would, most certainly, be a thousand times worse than even the ordinary commercial progress engraver to-day. That artists, too, often revile their saviour—he who made it possible to have facsimiles of their work instead of vulgar paraphrases—is sad, but the common blessings of life are rarely appreciated, and the process engraver is usually an intangible thing ending in "Co.," so we may curse him and his works in an abstract way, which does not clash with genuine appreciation for the work he is doing for art.

When we slang the evil photographer, we never mean the one we shake hands with, but the Automatic Supply Company, that sends us blocks, mostly a little late, and now and again does not touch its highest record, even as W. G. Grace himself has at times left a noble duck's egg for his share in the score. Then, especially if artists or editors, we rise to the level of the higher criticism, and deplore his existence. It seems to me, speaking on the side of the editor or the critic, knowing the daily worries of publication, the friction between process engravers and artists which the unlucky editor suffers as go-between, that the cutting prices, which must lower the artistic level, and the craze for too many cheap processes, should be the real object of attack, not the system itself.

Would any of the champions of wood-engraving *versus* process be willing to pay the price involved? Would they welcome a greatly restricted market for their drawings? Would their editors face many shillings an inch who now begrudge their pennies, or bear patiently the long delay inseparable from the best wood-engraving, when they grumble now if a block is not finished while the bearer waits?

We should blame the needless rush, the plethora of unnecessary pictures of people and incidents nobody wants to remember; blame the waste of good process blocks ruined by bad printing, and attack the foolish habit of plastering pages with pictures of anything and everything. So we need not trouble to defend the multiplication of inferior photographs; but in all we attack we should be quite sure we are not deploring the very things which our own taste has helped to create.

There is one branch of the subject I almost hesitate to attack here, but it must not be shirked, that is, the growing tendency to pose costume models for photography in direct rivalry to drawings by artists.

To condemn this absolutely may appear a purely prejudiced opinion. It is hard for any friend of the draughtsman to speak plainly on this, because it appears as if he were merely concerned for the income of his friends. But the practice is full of danger to art, and, I think, disloyal to the best ideals of photography.

If you can arrange your subjects, and send the result directly to the engraver, without employing a draughtsman, it looks like eliminating the unpopular middleman, who to-day, despite his proverbial position, does not find that in the middle is safety.

My own feeling is that, so far as profit is concerned, the artist is quite able to look with impartiality on this growing rivalry. It may, or it may not, diminish the incomes of a few second-class illustrators; that is not the question. The real danger is lest it create anew a low ideal of pictorial art, which is fortunately falling out of favour among painters.

For years past artists have fought against the schools which built up a theatrical group of models, costumes, and backgrounds, and transcribed it in a dull, literal manner.

I have seen a painter attempting an ideal picture of *Elaine*. He had draped and posed a commonplace model, at a modern window, covered with brown paper to imitate an Early English casement. In the raw light of the studio the mean device of the makeshifts were apparent enough, yet a painter could paraphase them and add dignity; but a camera reveals too much.

Such an ideal was accepted as artistic in the Early Victorian epoch, but now it survives only in quite unimportant quarters. It would be a thousand pities if the young art of the camera went astray in the same direction, for it would touch lower depths. The literal transcript of the photograph would spare you none of the mean facts. Your painter could impart a fine swagger to his model in cavalier costume at a shilling an hour; he could etherealise the too solid charms of his lady sitters, and make the girl who drops her h's and eats onions for lunch shine out as Ophelia or a sprite; but the camera gives you only the young person in fancy dress, posing amid obvious properties.

For an art that can record the track of a flash of lightning, or the sinking of a great battle ship, to sink to playing with theatrical properties would be preposterous. Indeed, to call it art is absurd; nor does the retort, that many pictures in many galleries are equally offenders, mend matters. Even in photography two negatives do not make one positive. In America they have gone a step farther than *genre* subjects, and have even illustrated serial stories with photographs from life, and the unpleasant result should scare others away; yet we see already a tendency to develop the idea on this side.

This desultory ramble over a few topics has gone on longer than I intended, because I had not time to prepare a shorter paper, for concise statement is the result of leisurely preparation, and this—written in a hasty evening, to be repented of at leisure, no doubt—has barely touched upon a few points which we all recognised before, but are (I think) sufficiently important to bring again to notice, since they touch upon vital relations between the art of the painter and the art of the photographer.

To sum up, I have tried to prove—

1st. That photography has for ever dismissed the convention which the wood-engraver substituted for the artist's own work;

2nd. That it has totally changed the ideal of composition, and led the public to appreciate the effects of ordinary life, heretofore deemed too common to be represented in high art; and

3rd. That it has called into being the impressionist, the *plein-air* school, and, above all, a new school of black-and-white men, who are devoting their best art to reproduction for process, and developing certain qualities that were never attempted before for popular illustration; and, having done so, for it to ape the older methods of picture-making would be folly.

Was it necessary to prove this to photographers?

There were two men sitting outside an American hotel, when a stranger passed, who gave himself great airs.

"Who is that?" said one.

"Jones, the greatest lawyer in the State of Ohio," said his friend.

"I come from Ohio, and I never heard of him," was the reply. "How does he prove it?"

"Prove it, man! Prove it? No need to prove it—he owns it!"

GLEESON WHITE.

RESIDUES FROM P. O. PAPERS.

FROM all accounts the Photographers' Benevolent Fund is languishing, what time, thousands of pounds annually disappear down the sinks and drains of most of the amateur, and no small proportion of the professional, fraternity. It is somewhat late in the day to write about residues; it is flogging the dead horse, to a certainty, and I, though privately continually harping upon the wisdom of saving, wherever possible, one's photographic waste products, should not have called attention in these pages to the matter but for the sake of giving a hint to those well-disposed brother workers, who, if not for themselves, might be inclined, in the interests of others, to give a little attention and time to the subject of my remarks.

It is very well understood why many workers find it to be not worth their while "saving their baths," &c. The extremely low price of silver, and the fact that the residue is sent to the refiner in a condition which is calculated to give him the most trouble, results in the sender often realising less than half the amount he had fondly hoped would be received.

It is a pity, but not a matter of surprise, if the photographer refuses any longer to take part in what he comes to think little better than a farce.

I don't know how far it may be carried out, but there is, without doubt, more incentive to saving when there exists in the town itself an easy and ready means of turning these residues into current coin at once, and with the least trouble.

I call to mind a small, decrepit, and slouching figure of a man who, in days gone by, prowled round the studios, and scented the amateur afar off. There was no peace or rest until he was allowed to purchase and carry off such "waste" as had been collected. On the principle that a "bird in the hand is worth two in the bush," he was, in some cases, allowed to secure undoubted bargains; but, on the whole, I think he dealt quite fairly with his clients. He

took, if required, the whole work on his shoulders, precipitating, and drying, &c., thus disposing of the great crux of the business.

I do not think we shall ever bring the ordinary worker in this direction beyond a certain point. He may "set up" a cask, may pour in his old fixing and toning baths, and may possibly be got to precipitate the same with zinc or sulphurated potash. There the matter will, as a rule, end, unless indeed, an individual of the genus above referred to steps in and completes the work. But there is another way. Could the average worker be induced to precipitate his residue and collect the same, might he not also be inclined to hand it over to an accredited agent of the Photographers' Benevolent Association, who, in his turn, would forward an aggregation of these offerings to a firm of refiners, who, again, might be trusted to remit their value to the fund? If it be true that half a loaf is better than no bread, it is equally true that a pound or two of silver sulphide would be better than no coin to the Photographers' Benevolent Association.

Not to make an interminable tale of it, wherever storage is not a difficulty—such storage room implying the space required by a cask of decent size—all residues should, as far as possible, be collected. Plates and paper, all waste, clippings, and the like should be fixed in old hypo baths. I have known a man throw into the dirt bin a spool of 8×5 films accidentally fogged. All waste of this kind containing silver bromide or chloride should be fixed "clear" and rinsed in water; not till then should they be thrown away. Old toning baths, *if in quantity*, are to be treated separately, otherwise I should add them to the other baths.

In the cask, therefore (which, by the way, is to be covered up), we shall have an accumulation of old fixing baths, various washing waters, and toning solutions. What shall we do with it?

Two methods may be practised. Get from the ironmonger or any worker in metal some scrap zinc, add this to the contents of the cask. The silver is deposited in a metallic state, the clear liquid should be decanted or run out by means of a plug inserted about two-thirds of the way down the cask. More waste liquors are added and precipitated until the amount of residue warrants further treatment.

If preferred, or it be more convenient, add to the tubful of liquor some sulphurated potash, a salt to be had of the chemist at a cheap rate. Take a pound bottle, remove the cork, and fill up to the neck with water, recork, and in a few hours, the bulk of the salt will have dissolved. Pour some of it into the cask, and stir with a piece of stick, allow the precipitate to settle, decant, and add more baths as before.

There is an odoriferous gas evolved which may prove objectionable. The "stink" is a thoroughly honest one, and quite uncompromising, not adapted for household consumption, but rather to be kept in some shady and retired corner where outsiders will not interfere with it. The smell evolved when using *zinc* is not so obtrusive, and therefore this method may find most favour.

We now come to the operation which will, perhaps, try the patience of the worker more than anything else. This is the collection of the residue. I don't know of any simpler way than the following:—

Make a frame of lath large enough to rest over and be supported by a household pail, lay over the frame a square piece of linen, using a few tacks to hold the same. Now, having run off the clear liquor as closely as possible, spoon out the soft and muddy precipitate on to the linen filter, and allow it to drain as nearly dry as can be. All we need do, however, is to get a well-drained mass sufficiently dry to be packed up without exuding further moisture, fold it up in its cloth, pack into some safe and inexpensive receptacle, and dispatch—whither? Well, rather than throw it away, or grumble at its small return, let the reader instruct the "refiner" to remit its value to the Photographers' Benevolent Association.

During an experience of some sixteen years, a time when the expenditure upon plates and paper has varied considerably between the sums of, say, five pounds and forty or more yearly, I can say, as a matter of fact, that it has always paid me to save my residues, this in a measure because there are methods of disposal and conversion of the silver salts other than through the refiner; but, even when discounted by the latter useful member of society, I don't remember one year in which the net result of a little trouble in saving of baths would not equal a contribution of at least half a guinea to a deserving charity.

J. Pike.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

VIII.

In dealing with interior work, it may be taken for granted that a very wide and varied class of subjects has to be dealt with, in hardly any two of which will it be found that similar conditions exist, or that exposures for such coincide.

In my practice I have met subjects that have required a sensitive plate being exposed for forty-eight hours, whilst in other cases a few minutes have sufficed, and in no other branch of photography that I know of (barring process work) is the need of downright hard experience more necessary than in interior work.

In many instances work has to be undertaken in places where not a ray of daylight enters, and then it follows that recourse has to be had to some system of artificial lighting. An example of this kind of subject will be met with in distilleries and bonded stores, which frequently have to be photographed for the purpose of making process blocks for book illustrations.

The mere photographing of an ordinary well-lighted room seldom or never offers any serious trouble, for, in a general sense, it will be found that there is always plenty of light at command and only a limited range of view to be dealt with, the chief factors being in such cases the selection of the most suitable points of sight for the camera, and the proper distribution of numerous articles of furniture, very many of which will always be found to mar the general effect by overcrowding or filling up what would much better be left blank space.

In subjects of this kind it is preferable to employ a good diffused light, whereby harsh contrasts are avoided; this is easily accomplished by simply arranging the venetian blinds so as to flood the room with soft light, and then giving the plate plenty of time in exposure.

The difference in results between such an interior lighted with a good diffused light, and when the same has the full blaze of light from its window concentrated, as it were, on one part of the room only, is very striking.

The employment of screens or blinds made of common book muslin, whereby the light from a window is not furnished with a suitable blind will often tend to make a great difference in the resulting photograph.

These muslin screens are easily fixed up without, in any way, doing damage to cornice or painted work of the window. One means of avoiding such damage is by attaching the muslin beforehand to long stripes of wood or laths. These it will be found, in nearly every case, can be hung over some cornicepole, or other part of the window, without requiring any nails or tacks being driven into the woodwork or plaster. In any case, a few long darning needles can be inserted in some crevice of the window sash, and on these the wooden support of the blind may be rested, should it be found that no other means is at command. With such, and the selection of the most suitable time of day for making the exposure, very interesting pictures may be secured.

It is, however, in dark interiors, where hardly a ray of light enters and where a very large and great depth of view has to be dealt with, that an operator will find experience his best friend.

In such instances, of course, artificial light has to be provided, and it must not be supposed that by this I mean the employment of any of the modern toy flash lamps which have become so fashionable; such are perfectly useless for work of this kind. What is required, is a system of lighting whereby a very brilliant and prolonged light can be maintained, so as to ensure a full exposure to the plate.

The mere flashing of a few grains of magnesium powder may be all very well in cases where a near object is being dealt with; but, in large spaces of dark interiors something very different is meant by the term "artificial lighting."

In instances where a considerable amount of space has to be illuminated, such as the interior of a bonded store or other similar place, no light will be found efficient that does not brilliantly illuminate the view for a period of at least three minutes in duration, and, whatever be the system of lighting employed, such must not be confined to one spot alone, there must be arrangements made whereby a number of lights can be burned at different places, at one and the same time.

The disposition of these lights is also a matter that requires some thought beforehand; if it is deemed necessary to place any of such in positions in front of the camera, as it is sometimes the case where a large side illumination is an advantage, the utmost precaution must be taken to prevent the direct rays from such falling direct on the lens. As a rule, from three to five lights will be found necessary in dealing with large spaces, and in the case of the employment of the larger number mentioned these may with advantage be placed as follows: one above but behind the camera, one each at a lower level, or about the same height as the camera is from the ground at equal distances on each side, while the two forward lights, that have to be thoroughly screened from view behind, may with advantage be disposed of slightly in advance, but well to the side of the view.

As to the best illuminant to employ, I have no hesitation in saying

that the mixture which Messrs. George Mason & Co. make up and supply when required is far away the best thing of the kind I have ever seen; it is a slow combustion powder, but it yields an intense actinic light, and when sufficient of it is placed in metal saucers in the shape of a cone, which is easily arranged by pressing a suitable shape cup on the proper quantity of it, after being lighted such will blaze steadily on for several minutes according to the quantity used in the saucers.

Of course, any thoughtful operator will also take all precautions against the possibility of a flare up, by further providing for a suitable protection outside and around the saucers; this is best done by some sheets of old metal or tin.

In using this powder a dense smoke will be thrown off, and it is just here that experience comes in and teaches an operator what is necessary to be done, for how to deal with the smoke has been a puzzle to many before now.

I remember on one occasion, when I had a commission on hand to photograph the interior of, perhaps, the largest bonded store in Scotland, that I had to wait for nearly a month, for no other reason than the difficulty of dealing with this matter of the smoke. In all bonded stores or interiors it will be found that there is a well-appointed system of ventilation; but, to a very great extent, this will depend upon the state of the atmosphere outside and the direction of the wind. There are very many little ways of finding out how the currents of air run, and what their strengths are in dark interiors. The one is by merely lighting an ordinary wax vesta and seeing how the flame is affected, the other is by using a mining anemometer. In any case, it is no use attempting to proceed with the work unless there are distinctly well-defined currents of air passing from in front to behind the position it is intended to place the lights in.

Much, however, may be done, provided there is plenty of wind blowing outside, to encourage these air currents by throwing open certain doors or windows or closing others, the main factor in all cases being the direction and force of the wind outside.

When it is seen that a well-defined and steady current of air is passing from the front to behind the camera, then and not till then should arrangements be made to ignite the cone of powder placed beforehand in suitable metal saucers. This is important, for on these saucers will depend a great deal of confidence on the part of the operator, for, should he, by making use of any makeshift arrangements, such as pieces of boards, &c., to hold the cones of powder, it is quite certain that, before the lights are all consumed, he will have an anxious time of it, and it is just about ten to one he will begin to wish himself well away from the place on account of the light possibly spreading and setting fire to the wood; but, with a well-arranged system of metal saucers, everything will go on sweetly and the lights burn merrily on for minutes, according to the quantity of powder employed.

In setting light to the cones of powder there is no better means to employ than an ordinary smoker's vesuvian, and when an attendant can be found to stand by each saucer and, at the word of command, light and then drop the fusee at the same moment into the powder, they will all blaze up simultaneously, and continue to burn until the powder is entirely consumed.

In work of this kind I have no hesitation in saying that a good isochromatic plate is a necessity, and such should be backed with a non-halation backing, of which nothing that I know of can equal bitumen, dissolved in equal quantities of chloroform and benzole. This can be applied when the plate is in the cell of the dark slide by a flat camel's-hair brush, and the bitumen will dry rapidly, a minute or so sufficing for the cells being able to be closed up. In making up the bitumen solution, sufficient should be added to the chloroform and benzole to turn the solution a deep yellowish-brown colour when spread on a sheet of glass.

In development it is not necessary to remove this backing till after the plate is developed, fixed, and washed; then a rag, dipped in benzole, will remove the bitumen as if by magic.

Another class of interiors that may be termed somewhat difficult are those in which but a very small quantity of daylight is present. Cases of this kind require very long exposures, but it may be taken for granted, however, that, whatever daylight enters and lights up a part of an interior, in no matter how small a degree, so surely will such part be impressed on the sensitive plate, *provided plenty of time be given.*

I have, as stated, in some instances, kept a plate exposed for forty-eight hours, and developed out detail in dark corners that was really astonishing.

T. N. Armstrong.

LABORATORY NOTES AND NOTIONS.

In my last "Laboratory Notes" frequent reference was made to hydrazine and its salts as a possible source of an ideal developer. This remarkable base, long looked for by the chemist and first successfully isolated in 1887 by Curtius, was described by him as a gas possessing such a strong affinity for water that it was practically impossible to produce it except as a solution or hydrate. It is only quite recently, however, that it has been shown to be, not a gas but a liquid, at ordinary temperatures, and at the freezing point it solidifies into a crystalline mass. The method employed, as published by Bruyn about the beginning of the present year, may be interesting and useful to intending experimentalists. The salt chosen was the hydrochloride (NH_2 HCl)$_2$, was made into fine powder and dissolved in pure methyl alcohol, in which it readily dissolves, in the proportion of ten grammes of the hydrazine salt to 200 c. c. of methyl. A calculated quantity of sodium methylate (CH_3ONa), also in methyl alcohol, was then added. Double decomposition at once ensued, without any rise in temperature, the HCl leaving the hydrazine and uniting with the sodium to form sodium hydrochloride, which, being insoluble in alcohol, is at once precipitated, whilst the free basic hydrazine remains in solution in the methyl, from which it may be separated by careful evaporation.

The same simple method of treatment may be employed to obtain hydroxylamine. In this case ordinary alcohol may be employed, as hydroxylamine salts are soluble in it, and it is more readily procurable than pure methyl alcohol. Hydroxylamine hydro chloride is powdered and dissolved by heat in ethyl alcohol or ordinary methylated spirit. An equivalent proportion of sodium ethylate is added, and common salt is at once thrown down. If carefully evaporated, basic hydroxylamine separates in well-defined crystals, which, however, are volatile, unstable, and deliquescent, and even in solution readily decompose with evolution of N_2O, N, and the formation of water. It combines readily with most acids, and forms crystalline salts, which are very stable. No attempt should be made, therefore, to keep this base for any length of time.

Sodium ethylate or methylate are easily obtained in the proportion required. The calculated weight of metallic sodium is added to the alcohol, and at once dissolves with the evolution of hydrogen. Potassium ethylate or methylate is obtained in the same manner by using potassium instead of sodium, and answers the same purpose, but is more expensive without corresponding advantage. It is, however necessary to obtain the basic hydroxylamine or hydrazine in order to build up synthetically the compound inorganic salts I am proposing as developers. And I may, perhaps, be permitted to say here that these are not mere "notions," but are taken from the notes recorded of a long course of experiments upon developers and development. As giving something more definite for the experimentalist to act upon, I will extract the following from many others, which was successful in forming a developer of remarkable energy, and possessing valuable properties. By the method described above, make a solution of basic hydroxylamine, and dilute the alcoholic solution, after separation from the precipitate with an equal quantity of water. Divide into two equal parts. To one part add freshly prepared cuprous oxide, and allow to stand a few hours with occasional shaking. A quantity of the Cu_2O will be dissolved, forming a colourless solution, which is strongly alkaline. Separate the clear solution from excess of Cu_2O, either by decantation or filtering, and add the rest of the dissolved base. Now pass into the solution a continuous stream of SO_2 until the alkaline condition is removed, and it is acid to litmus paper. You will now have a colourless solution of the double salt cupro-hydroxylamine sulphite, which is very stable, and may be kept as a solution and diluted as required, or may be evaporated down till crystallisation takes place, and the crystals preserved for use.

It is claimed for hydroxylamine that it possesses a developing energy equalling that of pyro. But the double salt described above is of much greater power. This is probably due to the well-known avidity with which the cuprous salts seize upon oxygen, and pass into the cupric state. This would render cuprous salts valuable as developers, were it not for the fact that the few that are known so readily absorb oxygen from the air, and rapidly become useless for this purpose. It is a property which hydroxylamine possesses of preventing this, and making a salt which is little affected by exposure to the atmosphere, that renders this compound salt peculiarly useful. A solution exposed in an open developing dish for a week scarcely

exhibited any change, or showed any loss of energy. The first result of oxydation produced by its use as a developer is the production of the usual N_2O from the hydroxylamine, which is taken up by the cuprous salt to form, first, cuprous hyponitrite, and afterwards cupric nitrate; and there is no evolution of gas to cause loosening of the film or blisters. The bromine, liberated from the silver bromide, also combines with the cuprous oxide to form a copper bromide, the well-known powerful restraining action of which gives the remarkable clean and clear development which results; and, as there is no carbon base or carbon addition required to the solution, there can be no precipitation of carbon as a dye or stain to discolour the film.

Hydroxylamine hydrochloride is an article of commerce, and may be readily obtained at the principal chemical dealers, and therefore it would be better to obtain it ready prepared. There are many methods of making it, which have from time to time been fully described in the chemical journals, and which it would serve no useful purpose to reproduce here. The simplest is that described in the recently issued edition of Watts's *Dictionary of Chemistry*, in which the NO_3 molecule of ethyl nitrate is reduced by nascent H to NH_2OH. For this purpose good methylated alcohol is perfectly suitable, and should first be made into nitric ether. A mixture of 300 grammes of alcohol; nitric acid, 400 grammes; and urea nitrate, 100 grammes, are placed in a flask and subjected to distillation until half the bulk has passed over, when a further mixture of three parts of alcohol to four of nitric acid is allowed to trickle slowly into the flask. The action of nitric acid upon alcohol is to produce a mixture of nitric and nitrous ethers, the latter of which is useless in the formation of hydroxylamine. The object of the urea nitrate is to prevent the formation of ethyl nitriate, or to convert any formed into the nitrate.

From the ethyl nitrate hydroxylamine hydrochloride is obtained by the reduction of the NO_3 molecule by nascent hydrogen into NH_2OH. To effect this, mix the nitric ether with an equal quantity of water, and divide into several flasks, to each 120 grammes of the ether adding 400 grammes of granulated tin and 800 c. c. of hydrochloric acid. Action proceeds without heat, and the flasks should be shaken from time to time. The addition of a drop of platinum chloride solution hastens the process considerably. When complete, the contents of the flasks are poured from the excess of tin, mixed together, and the tin precipitated by H_2S. The solution is then filtered from the SnS, and concentrated over the water bath until, on cooling, crystals appear. First ammonium chloride, and then a double compound of tin and ammonium chloride, separate out. These are removed, and the mother liquor evaporated to a small bulk, when a crop of crystals, composed of hydroxylamine hydrochloride, with a little ammonium chloride, is obtained. The ammonium compound may be disregarded for this purpose.

The precipitation by H_2S is a long and tedious process, however. A simpler and quicker method is to evaporate the solution to a small bulk, and then, when cold, add carbonate of soda to excess. The tin together with any iron or lime salts present as impurities are thrown down as insoluble carbonates and should be filtered off, the solution acidified with HCl and evaporated to dryness and the resulting residue treated with alcohol and sodium ethylate as described, when pure hydroxylamine will be obtained. E. Banks.

TESTS FOR SODIUM THIOSULPHATE.

In the present paper I propose to describe some of the more common tests for sodium thiosulphate, and to offer one or two suggestions as to the manner in which they should be applied in the photographic laboratory.

In order to secure the perfect elimination of this hurtful salt from our prints and films, thorough washing is, of course, a necessity. We find this generally admitted; but, oddly enough, we find as well that there is a growing tendency to curtail the washing process, and not only that, but in many cases to curtail it to such an extent that the actual time devoted to this operation represents no more than a fraction (often only a fourth or a fifth) of what was formerly considered needful.

It may, however, be argued that thorough washing does not necessarily mean prolonged washing. As a matter of theory, this may be granted; but, since it can be shown that with a shortened washing process, which shall be at the same time effectual, there is increased risk of detriment to the proofs or films (particularly in the case of the photographer who is unprovided with special appliances for carrying out this part of the work), there is always the danger that, in order to evade running this risk, the fractional washing may be performed in so perfunctory a manner as to fail of accomplishing its object, the removing of the soluble salts.

Unfortunately, as we are from time to time reminded in these pages and elsewhere, this danger is a very real one, and one against which it were well that we should take due precautions.

There is, however, a certain and ready means of solving the problem. By the application of one or other of the simple chemical tests for sodium thiosulphate it is very easy to ascertain whether the elimination of that salt has been secured; whether, in fact, the washing process has been thorough or the reverse.

It is, I fear, the case that there is a disinclination on the part of photographers to avail themselves of purely chemical tests in this connexion. This disinclination is perhaps due to a notion that these tests are next to worthless in other hands than those of skilled chemists. Such a notion, as I shall endeavour to show, is quite the opposite of the truth.

Of the various tests for the thiosulphates the only one that can be said to be well known outside of the laboratory is the iodine and starch test.

Free iodine, as most of my readers are, doubtless, aware, forms with starch a highly characteristic violet-coloured compound. When this compound is treated with a solution of sodium thiosulphate a double decomposition ensues, and the violet colour is discharged, sodium iodide and sodium tetrathionate being formed.

These reactions are represented in the following equation:—

$$I_2 + 2(Na_2S_2O_3 + 5H_2O) = 2NaI + Na_2S_4O_6 + IOH_2O.$$

There are several ways in which this test may be applied. One very commonly adopted is to treat old starch water or mucilage with a saturated solution of iodine in alcohol. A deeply coloured solution is obtained, which is then titrated with the sample of water suspected of containing thiosulphate. The absence of the latter is indicated by the colour remaining of the same degree of intensity throughout the operation.

This mode of applying the test, though not absolutely untrustworthy, is to a certain extent objectionable.

Seeing that the saturated tincture of iodine has a very pronounced colour of its own, it is difficult to ascertain the exact point at which a sufficient volume of the liquid has been added to the starch solution. Any excess of the tincture will, it is evident, impart a slight excess of colour to the test liquid. Consequently, even when the whole of the liberated iodine has combined with the sodium salt, there will be still a slight residual colouration, to destroy which an additional volume of the thiosulphate solution will be required.

In qualitative work this circumstance will not cause us serious inconvenience; but, in testing washing waters for thiosulphate, it is very desirable that we should have some means of roughly estimating the quantity of the salt in the portion of solution under examination. To effect this object, we must go to work in a different way.

If, in place of tincture of iodine, we treat a solution of potassium iodide with starch water, we obtain a solution which, in the absence of a body capable of liberating the iodine, remains colourless. When we wish to apply the test, we have merely to add dilute chlorine water to the liquid. The iodine thus liberated combines with the starch, and the characteristic violet-blue colour is produced. If, however, we continue to add chlorine water to the violet liquid, we find that the colour is gradually weakened, and finally altogether destroyed.

This curious change is effected by a secondary reaction in which the more powerful halogen plays an important part. The chlorine, in fact, now unites with the iodine to form iodine trichloride.

Now, in quantitative testing, it is a matter of the greatest importance that all the experiments of a series should be made under precisely similar conditions. To ensure this, we must, amongst other things, be careful to employ constant weights of the different substances which we are using as tests.

To take the case in point, there are the three substances, starch, potassium iodide, and chlorine water. The two former, being solid bodies, will cause us no trouble. With the latter it is otherwise. Mainly on account of the circumstance that chlorine water is not an article of commerce, we cannot obtain this reagent as a gaseous solution of constant strength. Even if we could, we should soon find its specific gravity begin to vary, for the gas is gradually given off even at ordinary temperatures. How, then, it may be asked, is it possible for us to employ such a variable solution, when we have to perform a series of operations in quantitative analysis?

The secondary reaction just now referred to helps us out of the difficulty.

What we must do is this:—

Having filled a burette or alkalimeter tube with the chlorine water (previously diluted if necessary), we must add the solution slowly and carefully to the test liquid in which are dissolved the weighed constants of starch and potassium iodide.

Presently the violet colour will make its appearance. We must, however, go on cautiously, adding the chlorine water, drop by drop, until just enough has been added to discharge the last trace of colour from the liquid. We now read off on the burette scale the number of measures that have been consumed in the operation. This number is to be taken as representing the volume of chlorine solution required to convert all the iodine present into iodine trichloride. The chemical formula of the latter substance is ICl_3. Since a single equivalent of chlorine will always liberate exactly a single equivalent of iodine—neither more nor less—one-third of the number of measures actually consumed would have been required to liberate all the iodine in the experiment from combination. Therefore, by adding this third to a second and similar portion of the solution of starch and iodine, we ensure the production of one definite degree of colouration which can be reproduced with the utmost exactitude in the successive experiments of the series. If, as is unlikely, these experiments should extend over a considerable period (say a week or more), it may be necessary to restandardise the chlorine water.

Of course it need hardly be said that the latter, representing as it does a standard volumetric solution, must not be diluted after its strength has been once definitely ascertained in the manner just described.

As to the quantities to be employed in actual testing, I have found it convenient to take two grains of dry powdered starch, and moisten the same with thirty minims of a solution of potassium iodide of the strength of twenty-four grains per fluid ounce, the said thirty minims representing 1·14 grain of combined iodine. The thin paste so formed should be well stirred up in a white porcelain basin during the addition of the standard chlorine solution. If the latter is of the proper degree of dilution, about one fluid ounce will be required to produce the full violet colour.

Having obtained this colour in its normal intensity, we must next proceed to test the liquid with a weak thiosulphate solution of known strength. To form this solution one grain of dry crystallised sodium thiosulphate should be dissolved in a pint of distilled water. There is no need for us to use the pure salt in making up this solution; the commercial thiosulphate is quite as suitable, and in point of fact is to be preferred, if only for the reason that it, and not the other, is the salt which is employed for fixing purposes.

This standard solution, contained in a burette, must be added drop by drop to the contents of the basin, as in the case of the chlorine water. The violet liquid must be stirred continually during the addition until the sudden change of colour from violet to yellowish-white indicates the completion of the process of decomposition. As before, we then read off on the burette scale the number of grain measures of solution which have been added to the test liquid. Knowing that the burette is graduated to contain 1000 grain measures, and that one imperial pint is equivalent to 8750 grains of water at 62° F., we can, by a short calculation, readily ascertain what fraction of a grain of thiosulphate has been consumed in discharging the violet colour.

Once we have gone through these necessary preliminaries, we may proceed to test our washing waters in the same way.

For washing purposes eighty ounces of water (four pints) should be carefully measured into a half-gallon bottle.

To facilitate refilling, a strip of paper should be gummed round the neck of the bottle, the upper edge of the strip being placed on a level with the surface of the water. The contents of the bottle (or, if necessary, a multiple of the contents) having been poured into a washing vessel of suitable capacity, the prints or plates are washed in the usual way, and afterwards removed to a second vessel containing a like volume of water.

After washing, samples of the successive waters are withdrawn for testing purposes, precautions being taken to enable the operator to treat them in their proper rotation.

Applied in the manner just described, the iodine and starch test is an exceedingly delicate one. Sometimes, however, especially when we are dealing with a large volume of washing water, we must modify our procedure in order to obtain exact results.

To illustrate my meaning, I will take an actual case. Four $3\frac{1}{4} \times 4\frac{1}{4}$ silver prints on albumenised paper were toned and fixed in the ordinary way. On removal from the fixing bath they were immersed for five minutes in a strong solution of sodium chloride. They were then washed for ten minutes in forty ounces of water, and after that for ten minutes in a second forty ounces, and so on for other forty minutes, there being six washing waters in all. Two fluid ounces of each of the washing waters were preserved for analytical purposes. The first and second samples were found to discharge the violet colour almost instantly. In the case of the third sample, a great reduction in the intensity was perceptible, and a slight reduction in that of the fourth sample. The fifth and sixth waters did not visibly affect the colour of the test liquid even when the whole of the sample was added.

Here, then, in a case in which the washing water amounted only to forty ounces, two ounces thereof did not suffice to discharge the violet colour even at a comparatively early stage in the operations. It follows, therefore, that, when the volume of the washing water is considerably augmented, it will be found necessary to withdraw a correspondingly large portion for purposes of analysis.

In such a case the delicacy of the test is likely to be interfered with through excessive dilution. Accordingly, under these circumstances, it is advisable that the washing waters should be concentrated by evaporation before the test is applied.

A large porcelain evaporating basin supported on a tripod over an Argand gas burner should be employed to effect the concentration. The evaporation must be carried on till the sample is reduced to one-fourth of its original bulk. Since the violet colour of the starch compound is discharged by heat, the concentrated solution must be allowed to cool before we proceed to apply the test.

When the washing is performed in running water, it is hardly possible to estimate with any accuracy the amount of thiosulphate present, seeing that it varies from minute to minute. In such a case the water that drains off from the prints or plates should be collected at intervals in a large test tube, and, when enough has been obtained, the thiosulphate may be estimated as before.

I shall now describe as briefly as possible two tests of a more simple character.

The first is the ferric chloride test.

When a solution of ferric chloride is added to one of a soluble thiosulphate, a rich purple-brown colour is produced. Provided the latter solution be not too dilute, the change of colour from yellow or orange to brown is very perceptible, so that, subject to the condition just mentioned, the reaction serves as a good qualitative test for the thiosulphates.

The strength of the chloride solution must be carefully attended to. In practice, one ounce of the ferric chloride may be dissolved in four fluid ounces of water. To form the test liquid one drachm of this concentrated solution is to be diluted with ten drachms of water.

Ten minims of this dilute solution will give a distinct purple-brown colour with the one-hundredth part of a grain of sodium thiosulphate. The volume of water present should not exceed two drachms, otherwise the change of colour will be so slight as to be nearly imperceptible. Samples of washing waters must, therefore, always be concentrated by evaporation before applying the ferric-chloride test. I may as well mention, in passing, that on heating the solution the brown colour is destroyed, and the liquid assumes a pale green hue, owing to the formation of ferrous chloride.

The second test is that proposed by Carey Lea for the detection of palladium and other metals of the same class.

A solution of sodium thiosulphate is rendered alkaline by the addition of a little liquor ammoniæ. A drop or two of a solution of a salt of palladium (the dichloride, for instance) is then added.

On boiling this pale yellow liquid a warm brown colour is produced, which gradually darkens, and in course of time becomes almost black. The reaction affords a delicate and characteristic test for sodium thiosulphate as well as for the salts of palladium.

The test may be applied in another form, by substituting ruthenium trichloride for the palladium salt. In the latter case, boiling changes the yellow solution, not to a brown but to a vivid purple-red. A mere trace of thiosulphate may be detected by this means.

The two tests just described are best adapted for qualitative work, and in such they may be found of service by the photographer.

The detection and estimation of sodium thiosulphate may, of course, be effected by other means. There is, for instance, the permanganate test, perhaps the most suitable of all for adoption in photographic laboratories. This, along with several less well-known tests, it is my purpose to describe on a future occasion in a second paper.

MATTHEW WILSON.

PROCESS ENGRAVING.

AN INTERVIEW WITH CARL HENTSCHEL.

[Publishers' Circular.]

THE interviews with Mr. Reichardt and Sir William Ingram, which recently appeared in our columns, have drawn attention to the question

of photography and the part it plays in the illustration of journals and magazines. Following up the subject, I thought, says our representative, that it would be interesting to learn the views of one of the best living authorities on photo-engraving, viz., Mr. Carl Hentschel, and I therefore called on him at his London office in Fleet-street, where I found him up to the eyes in work. He, however, very readily granted me an appointment for the next day, when, after a few introductory remarks, he favoured me with the following interesting particulars:—

"My father, August Hentschel, was Russian by birth; he was a naturalised American. About thirty years ago he settled in England. His profession was that of a photographic experimentalist. He was a pupil of Daguerre, from whom he learnt the art. So far back as 1870 my father was conducting exhaustive experiments with a view to perfecting a process of photo-engraving. In these he was very successful at that time, but could get no support, process work not being in favour. He therefore devoted his energies principally to photography on wood, and was well known by, and did work for, all the principal wood-engravers of the time. Later, as the demand for process work became apparent, he devoted himself entirely to it, and in 1880 a company was formed to work his secret process."

Mr. Hentschel then told me, somewhat shyly, one or two little incidents of his boyhood; how that he had watched and assisted his father in all his experiments, &c. In answer to a question, he said, "I have never been anything but a process engraver. My connexion with the trade dates from 1880, when I held an important post, at the age of sixteen years, in the company I spoke of. I continued with the company until the commencement of 1887, when disagreements arose, and I decided to commence business on my own account, though I was then not twenty-two years of age. I accordingly took these premises, which, you will probably remember, were occupied by the late Mr. Greening, who was associated with the publishing trade as a wholesale bookbinder. In four weeks I had the place in working order and fitted with the electric light. My arc lamp outside was one of the first in Fleet-street, and attracted considerable attention. At that time the appliances required were not so elaborate as now, half-tone etching was not in vogue."

"And you had a struggle?"

"Yes; but I meant to succeed, and I am pleased to say that, from the very first year (1887, when I employed a dozen hands), my business has steadily increased all these years, and not only have I extended my place here by taking in adjoining premises, but I have fitted up special studios at Norwood, where the light is clearer and better than in the City, although the studios there are fitted up with electric light. My staff at the present time consists of upwards of ninety hands, and that is, I think, the largest staff employed by any process firm in England.

"To give some idea of the enormous quantity of work that is done here, I may say that last year we dispatched some 60,000 complete blocks of all sizes. The work is constantly increasing, but, nevertheless, I make a point of turning it out rapidly, and I may say, without exaggeration, that seventy-five per cent. is delivered the same day."

"It is only *recently* that you have acquired this wonderful dispatch, is it not Mr. Hentschel?"

"It is only during the past eighteen months that I have perfected my half-tone arrangements, which have enabled me to turn the work out with such promptness."

"Much has been said lately, *pro* and *con.*, respecting process photograms. Do you mind giving your views on the subject, Mr. Hentschel?"

"Not at all. My contention is that in a few years the pictures which are now being reproduced from photographs will not possess anything like the same value as they would had they been drawn in the first place by well-known artists. A few years ago each paper had its own particular characteristics, a permanent staff of artists being employed by each. *Now* it is not uncommon to see a reproduction of the same photograph in three or four of the leading illustrated journals.

"Personally, I favour the direct-line process in preference to the mechanical half-tone process; and it is a significant fact that all the reproductions appearing in the Salon Catalogue are by line process.

"There is," continued Mr. Hentschel, "a popular idea that a photograph can never lie. That is not so, expert photographers are now so clever in preparing composite photographs that one must be prepared to believe almost anything. The *Strand Magazine* lately had an article showing what could be done with composite photographs. A beggar can be photographed in the street, and placed 'quite natural like' in a drawing-room. Besides, some of the snap-shots which are now taken of popular events are very curious specimens of how you can distort with the camera. For instance, in a snap-shot of a royal carriage which I saw the other day, the pair of horses were gigantic as compared with the carriage. Some wonderful results, however, can be obtained by snap-shots, and most interesting they are; but, now that every second person goes about with a Kodak, the novelty for photographs will wear off, and the public will tire of them; then, let us hope, there will be a chance for the artist. Sir William Ingram's idea is a good one, that is, that artists should compose their drawings from photographs. Well, I dare say you know that in America the artist makes good use of the photograph. He will get a snap-shot of any special thing, enlarged on a specially prepared paper, work over this photograph (which really takes the place of a rough tracing) with pen and ink, after which the paper is chemically treated, the photograph disappears, and you have your pen-and-ink sketch, with all its lifelike characteristics, there being nothing to suggest that it is not a very clever original sketch; in fact, some of the cleverest pen-and-ink sketches in America are done this way."

THE CAMERA AND ITS ADJUSTMENTS.

[South London Photographic Society.]

As this is a beginner's evening I shall commence my paper by giving a little advice respecting the selection of a camera.

My counsel to all novices is, Begin with a small camera, namely, a quarter-plate, that is, of course, unless you have plenty of cash to waste on it. Some beginners, and I have heard of several of them, start with a large camera, and their photographic career has ended rather precipitately. The cause of this is that they have photographed everything that came in their path, got bad or indifferent results for the money they spent, and at last gave up in disgust. Now, if only a quarter-plate camera is purchased, be sure and avoid the previously mentioned examples of working; that is, don't snap at everything and everybody. Use a little thought and care in selecting your subject, no matter whether landscape or figure. Try landscape first, and then, when you have overcome natural technical difficulties, try portraiture, and in trying portraiture select for your subject children, if possible, but not too young—say from about six to twelve years of age—only take care you do not offend a fond mother by producing the picture of her darling anything but like the original. I have had several experiences this way, in my earlier career, with very young children, and I have no doubt some of our other members here have also; in fact, mothers are very hard to please with regard to their offspring. My reason for advising the taking of youngsters in preference to old and more mature persons is, firstly, they are more interesting subjects; and, secondly, if you produce a result not quite the thing, you are not so likely to offend your sitters as in the case of elders.

Warning: Don't buy a hand camera to start with.

Coming back to the camera itself again, another reason for selecting a small camera to commence with is its comparatively light weight. When your enthusiasm grows, then buy a larger camera; but, if you have plenty of money, then encourage trade by going in for a large-size camera and send the platemakers' profits up by spoiling as many plates as you can.

Hearing that a friend had a quarter-plate for sale, I started my photographic career by buying his kit for 15*s*. You cannot get a good thing under that price, I must admit, but this apparatus, fortunately, happened to have a superior single lens.

It isn't at all necessary to buy a *new* camera in starting; that is, at least, my opinion. Second-hand ones can always be purchased. Watch the advertising columns of the photographic papers and you will soon get suited. Select one that has a square bellows. Those with conical bellows may pack up better, and, as some think, look neater than square, but there is the danger of getting your bellows knocked in, not noticing it, and so cutting off part of your picture. So buy a camera with a square bellows.

Now we come to the principal adjunct of the camera. This you will readily infer is the lens. There are three kinds of lenses generally used by the amateur, called single, R.R., and wide-angle, although there are many other divergent forms springing from these.

Single lenses are really intended for landscape work, but I have seen good portraits taken with them. If you cannot manage to get a R.R., a single lens will do very well to start with. A R.R., however, should be obtained as soon as it is convenient to your pocket. These lenses may be described as universal in their use, landscapes, portraits, and even architectural subjects may be taken with them.

Wide-angle lenses are used principally for architectural work, but the beginner need not trouble himself about procuring one of these at the outset of his photographic career. He will have enongh to trouble his head about with other things. In choosing your lens have, if possible, one that will cover a larger plate than that you are intending to work. The advantages of having a larger covering power lens for your quarter-plate camera I will explain later on.

Now we come to stops or diaphragms. These very important accessories of the lens are rather puzzling at first to the novice, but he will soon get to know their use. I have no doubt, having had no instruction in the matter, he wonders what is meant by *f*-8, *f*-16, *f*-32, and so on. *F* means focal, and the numbers indicate the relation of the opening in the diaphragm, to the focus of the lens. To ascertain the focus of your lens and also to find out that the stops are marked correctly, focus up some object about 150 yards distant, then measure the distance between the inside of your focussing glass, to the diaphragm slot of your lens; this will determine the focal length of the lens. Next measure the diameter of the opening in your stop, then divide diameter of stop into distance of focus. For instance, if the distance between your lens and focussing glass is, say, ten inches, and the diameter of your stop half an inch, ½ into 10 = 20 = *f*-20. Regarding the guide of these stops for exposure, there is a rule. Illustrating it, however, say *f*-10 required an exposure of 1 sec., *f*-20 for the same view would require 4 sec., and *f*-40 16 secs. But, in my opinion, you waste time in calculating exposures in this way.

After a few experiments you get to know within a little the amount of exposure to give. Stops are used to bring objects into focus, which, without their assistance, would be blurred. The smaller the stop the sharper will be your picture, and the exposure prolonged as per rule given above.

In all stand cameras there should be a rising, falling, and side movement of front, and a swing back. You will find that all of these come in very useful in their turn. I mentioned a little while ago of having a lens covering more than your plate. Now, I will explain the advantage of this. You focus up a landscape, having your camera perfectly level. You want something more in, either at the top, bottom, or sides of your plate. Do not tilt your camera, but use the rising or falling or side movement of your front, and having a larger lens you will find the sides and top and bottom of your picture fairly sharp, and by inserting a stop quite so.

Now we come to a very useful and important adjustment of the camera. I refer to the swing-back arrangement. This is used for correcting the tilting of the camera either upwards or downwards, and is more especially required for architectural work. For instance, say you have to tilt your camera for taking some high buildings, that naturally makes some of the straight lines appear crooked on your ground glass, but by using your swing back, which should always be perpendicular, you will be able to correct this.

The swing back can also be used for bringing distance into focus without the necessity of using a small stop. The side swing will also be found of great use, more especially in landscape work.

And now last, but by no means least, we come to the tripod. This should be as light as possible, but, when put up, perfectly rigid.

If there are any gentlemen present who are wavering whether to go in for photography or not, let them give it a trial if they can find the necessary time; I don't think they will regret it: I never have.

WALTER C. BOYCE.

EXHIBITION AT THE ROYAL AQUARIUM.

THE second photographic Exhibition, now on view at the Royal Aquarium, was handicapped by an unfavourable date and other causes, including those exhibitions which opened immediately anterior to it; nevertheless, a creditable display of work has been got together, which has the distinct advantage of giving several comparatively unknown but promising photographers an opportunity of securing public comparison and criticism of their efforts. The photographs are placed, in their classes, on small screens on tables on the ground floor of the main hall, and the arrangement is such as to highly conduce to one's convenience in examining them, "skying" and "flooring" being entirely obviated.

The photographs are arranged in ten classes. That for Landscape and Seascape (A) contains some passable work, the best being probably E. Dockree's crisply defined *Winter* landscape. Among several contributions from Mrs. Fawsett we noted a *Panoramic View from Lac Blue*, two pictures joined up and forming a fairly successful panoramic effect. The "join," however, might surely have been rendered less prominently. Some old friends figure in Class B (*Genre* and Figure Studies), notably Mr. W. Gill's pathetic figure of a sightless mendicant, *Blind*. We so seldom meet with exhibits from Messrs. Chaffin that we are glad to welcome their work, but *Finishing Touches*—a lady artist at work– compels us to say that it complies with every photographic canon, but lacks the force, plasticity, and conviction of a picture.

Instantaneous Work (Class C) finds its best exponents in Mr. Dockree and Mr. W. Thomas, the former gentleman's *Stormy Sunset*, taken on the river near the Tower Bridge, being a perfect translation of the melting of sunset into twilight. Dr. Hall Edwards' flower studies, and Mr. W. Norries' series of seabirds are the most striking exhibits in Class D (Animals, Flower Studies, &c.). One or two large heads (Enlargements), by Mr. Smedley Aston, deserve a word of praise, but otherwise the class is poor and indifferent, a remark applying also to G (Portraiture), which supplies us with more material for unfavourable criticism than we care to avail ourselves of. In the Champion Class we come to another ambitious effort of Messrs. Chaffin, *Intercession*, representing a kneeling woman putting in a word to her stern parent for a sheepish-looking lover, or a penitent brother. You can "read" the picture in a variety of ways. It is a fine photograph, and the facial expressions of the three actors are, on the whole, well rendered, but it is not Messrs. Chaffin's fault that there is nothing to thrill or convey emotion or sentiment in the ensemble—it is the fault of photography. A splendid piece of architectural work, beautifully selected, exposed, defined, and printed, is Mr. Gear's *Behind the Reredos, Winchester*. The same gentleman figures in other classes with good examples of his undoubted skill. The architectural class is almost monopolised by members of the South London Photographic Society with familar photographs of Ely Cathedral, Westminster Abbey, &c. In the Society Competition, the East London Society, if we mistake not, send the exhibit lately on view at the Agricultural Hall.

The Craotint Company have some excellent portrait enlargements in colours and monochrome, while the Etching and Photogravure Company occupy a large stall with numerous fine examples of photogravure. Mr. Hana, of the Strand, who devotes himself to theatrical portraiture, here successfully draws attention to the *chic*-like qualities of his work, which is deservedly popular in "the profession."

In the Apparatus Section the Platinotype Company have a series of platinotypes showing this admired process to perfection. The Company demonstrate the process three nights weekly. Mr. Walter Tyler occupies the place of honour (and we hope profit) in the hall, with a fine display of lanterns and photographic apparatus generally, and that enterprising South London house, the Prosser Roberts Company, also have a large and skilfully arranged stand of photographic apparatus and chemicals, which is as varied as it is complete. Messrs. C. M. Higgins & Co.'s stall is devoted to their photo-mounter, of which we have already favourably spoken from actual trial, and Mr. Theodore Brown, of Salisbury, exhibits his stereoscopic transmitter and numerous stereographs taken therewith.

The Exhibition remains open for about a fortnight longer, and should at any rate be interesting to the general public. Next year we understand that an attempt will be made to enlarge the scope of the Exhibition by selecting a more suitable date, and setting the preliminaries in motion in plenty of time.

Our Editorial Table.

CONVENTION PHOTOGRAPHS.

MR. T. BROMWICH, of Bridgnorth, sends us a mounted print of the group he took of the Convention party that visited Bridgnorth on Tuesday, July 16. A capital photograph resulted, and the print before us, which bears the appearance of being in platinum, is of marked technical excellence, the grouping of the figures and the likenesses being exceedingly well rendered. Mr. Bromwich is a photographer of great taste and skill, and his studio, which we had the opportunity of visiting when at Bridgnorth, is a model of neatness and artistic arrangement.

A Souvenir of Picturesque Shrewsbury. Published by Messrs. Adnitt & Naunton, of Shrewsbury.—This is a prettily got up collection of sixteen views of the more picturesque parts of Shrewsbury, well printed, so as to resemble bromide prints. The negatives were taken (and well taken) by Mr. W. W. Naunton, and no more pleasant and artistic souvenir of the Salopian town could have been devised.

CATALOGUES RECEIVED.

MORLEY & COOPER, 70, Upper-street, N. Photographic cameras, lenses, and accessories are particularised in great variety in this catalogue, which runs to ninety-two pages, and is freely illustrated.

THE BRITANNIA WORKS COMPANY, Ilford, are issuing a new and tastefully printed price-list of their plates, papers, and films, prominence being given to the Company's latest introductions, including the Ilford "Empress" plates; Ilford films; Ilford process plates; special P.O.P., for producing soft prints from hard negatives, &c., coloured facsimiles of the various labels being also given.

EXTERIOR AND INTERIOR PHOTOGRAPHY.

By F. W. MILLS, F.R.M.S. London: Dawbarn & Ward.

THE *raison-d'être* of this book being called into existence is stated to be that, while much has been written on the artistic treatment of landscape photography, the treatment of architectural subjects, both exterior and interior, has been neglected. This, we think, is scarcely valid, for we are conscious both of a good deal of information having been given on this subject and, in a special manner, of both interiors and exteriors having been taken, and well taken too, by photographers *usque ad nauseam*.

From the title of the book we might have expected to find more information on its announced subject than is the case. It contains many truisms with which no fault can be found, provided they were confined to a manual of photography for beginners. For example, in the first chapter, which is devoted to apparatus, we are told that the apparatus necessary consists of a camera, tripod, lenses, and the usual accessories; that the bellows should not taper to the front too rapidly, else will a portion of the image be cut off by their interposition between the lens and the plate; that the tripod must be firm, and may be attached to the camera by a screw or a rotating turn table; that most tripods are not tall enough; that the inside of

the lens mount and the stops should be black. These, with other truisms which constitute the first chapter, are all very excellent things to know, provided they are not self-evident propositions even to the class for whom the book is intended.

In the second chapter, on *Light and Colour*, we are told that sunlight is either emitted, reflected, or transmitted; that white light is composed of a number of rays varying in refrangibility and the length of their vibrations. We here find Professor Rood's tables of the quantity of the various colours of the spectrum and Vierordt's measurement of their relative brightness, with information relating to the orthochromatising of plates. This chapter seems to us to be far over the heads of the reader for whom the rest of the book is intended. The two following chapters treat of exposing the plate, and following these are others, respectively, on development and intensification, printing in platinum, bromide and carbon printing. Now, all these topics are useful enough in themselves, but they are scarcely in place in a volume purporting to treat specially of photographing architectural interiors and exteriors, a topic the author has not judged it necessary to say much about. The book, however, is nicely got up, contains fifty-eight pages, with an appendix relating to weights and measures, and sells at 3*s.* net.

Convention Snap-shots.

By Walter D. Welford.

Those who recognised Mr. Welford in the Convention group, and noted his attitude, would have seen in him a hand-camerist ever ready for a shot. He has submitted for our delectation a liberal contingent selected from the 140 exposures he made during Convention week, and it need scarcely be said that they represent, in a worthy manner, the ability of Mr. Welford to shine in that walk he has so specially made his own. They mainly represent members when taken unawares at street corners or hotel doors, although some of them are pretty scenes outside of the town. It looks very like a record if we state that, after returning home, Mr. Welford had developed his 140 exposures, and had submitted prints from them to the club meeting on the 24th ult., this without any assistance.

News and Notes.

The Convention.—The signature-book at Dublin recorded 123 names, and that at Shrewsbury 154.

The war of prices still continues. In Sydney and now in New Zealand unheard-of advantages are offered in order to attract and enlist the patronage of the public—advertising firms offering to give a dozen cabinets for three half-crowns and a 15×12 opal for another five shillings. The wonder is that a free lunch is not provided for sitters and their friends.—*Sharland's New Zealand Photographer.*

An interesting experiment has been inaugurated by the Technical Education Board of the County Council. The premises in Bolt-court, Fleet-street, formerly used by the Stationers' Company as a school, have undergone a thorough repair, and have been fitted up as a school of photography. For the last two months evening art classes have been conducted under the control of the National Society of Lithographic Artists, and arrangements have now been made to commence a school of photogravure and half-tone etching. These classes will commence in September or October next, under the management of a committee consisting of six nominees of the Lithographic Artists' Society and six nominees of the Board.—*Daily Telegraph.*

Death of Mr. M. Auty.—We are sorry to learn that, on July 29, Mr. Matthew Auty, the well-known photographer, of Tynemouth, died at Dene House, Ellison-place, Newcastle. The deceased gentleman, who was only forty-five years of age, commenced life as a tobacco operative, serving his time with Mr. John Harvey in Newcastle, and afterwards commenced as a retail tobacconist on his own account at Tynemouth. While acting in the latter capacity, Mr. Auty took much delight in photography, and so great was his success as an amateur, that he was induced to commence business in Front-street, Tynemouth, as a professional. This departure turned out to be a perfect success, and so excellent were the productions that emanated from his studio, that in time prizes from all parts of England, Scotland, Ireland, and Wales were awarded to the Tynemouth photographer at exhibitions held at various places, while, in 1887, a similar honour was forthcoming from the Exhibition at Florence. The productions that gained most of these prizes were exquisite local views and marine photographs, executed in faultless style. Mr. Auty, however, was also famed as a capital portrait-taker, and as a photographic artist altogether of great merit. He was known to many persons, both amateurs and professionals, in the photographic world, who will all deeply regret to learn of his death. A Vice-President of the Newcastle-on-Tyne and Northern Counties Photographic Association of Newcastle, Mr. Auty was always ready to place his services and experience at the disposal of members of that institution, and his wise counsel, ready aid, and warm interest will by them be greatly missed. The deceased gentleman, it may be added, leaves a widow, but no family.

Royal Cornwall Polytechnic Society.—The Sixty-third Annual Exhibition of this Society will open at Falmouth on Tuesday, September 24, 1895. Medals and prizes are offered in the following departments:—Fine Arts: Pictures and drawings, sculpture, modelling, art metal work, wood-carving, art needlework, &c. Photography: Photographs by professionals and amateurs, photographic apparatus. This Exhibition has been established over sixty years, and affords the best opportunity for making known the merits of inventions, &c., throughout the West of England. The Exhibition will be held in a spacious hall and adjoining rooms, and will continue open for five days. No charge will be made for space. Advertisements are invited for the Exhibition catalogue; for terms, see prize list. List of prizes and all further information may be obtained from the Secretary, Edward Kitto, F.R.Met.S., The Observatory, Falmouth.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 13,948.—"An Improvement in Portable Photographic Cameras." Communicated by T. Finch. W. Harding.—*Dated July*, 1895.

No. 13,959.—"Improvements in and connected with the Manufacture of Oxygen." Complete specification. H. L. A. Lapointe.—*Dated July* 1895.

No. 14,058.—"Improvements in Photographic Apparatus." M. Hirschensohn.—*Dated July*, 1895.

No. 14,104.—"Improvements in Papers for Photographic Purposes. Complete specification. H. Wandrowsky.—*Dated July*, 1895.

No. 14,202.—"Improvements in Cameras and in Fittings for the same." A. E. Salt.—*Dated July*, 1895.

No. 14,208.—"Improvements in Producing Inexplosive Acetylene Gas." C. E. Bichel and E. Schulte.—*Dated July*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
5	North Middlesex	Excursion: Cobham for Stoke d'Abernon.
5	South London	Exc.: Cobham, Kent. Leader, B. Lyon.
6	Birmingham Photo. Society	
6	Brixton and Clapham	
6	Exeter	
6	Hackney	
6	Herefordshire	
6	Lewes	
6	Oxford Photo. Society	
6	Paisley	
6	Rotherham	
6	Sheffield Photo. Society	
6	York	
7	Leytonstone	
7	Photographic Club	
7	South London	*Printing Processes, Toning and Fixing.* Messrs. Moss and Slater.
7	Southsea	
8	Glossop Dale	
8	Hull	
8	London and Provincial	
8	Manchester Photo. Society	
8	Oldham	
9	Cardiff	
9	Croydon Microscopical	
9	Halifax Camera Club	
9	Holborn	
9	Maidstone	
10	Hull	
10	Leytonstone	Ordinary Meeting.
10	Oldham	Excursion: Macclesfield for Gawsworth. Leader, J. Chadwick.

Croydon Camera Club.—Following upon a series of trips to Gomshall, Addington, Coulsdon, and Hever, a party of eighteen members braved the wind and rain of Saturday, July 20, in order to participate in an excursion, which had been organized by the President to visit Tilbury Docks, there to inspect and photograph that great steam liner, *Ormuz*. Unfortunately, at the last moment, a sharp attack of influenza prevented Mr. Maclean from filling the *rôle* of leader, which duty was, however, efficiently performed by Mr. H. E. Holland. Arriving at the Docks shortly after three o'clock, the party was there met by an officer of the Orient Company, who piloted the camerists over the ship, and pointed out the many stupendous and surprising mechanical and other details which form part of the interior organization of this huge vessel, whose length is no less than 481 feet, and displacement 10,500 tons. That the lighting is electric is a matter of course; not so that all the compartments are fitted with a system of pipes, arranged that in case of fire—so greatly dreaded at sea—a flood of water, or of steam, can be instantly turned on to the place of conflagration. Other interesting matters were the hydraulic gear, in place of steam; the suction-pipe system of ventilation, worked by a powerful air pump; and the steam heating arrangements; also the refrigerating chamber. Amongst the larger saloons, the coffee-room caused most interest, several negatives of it being attempted. Decorated in mahogany, satin wood, and rose wood, and possessing highly finished carved pillars, this, the general first-class dining saloon, measures as much as fifty-six feet long by thirty-three-feet wide. Even more interesting to a majority was an inspection of the huge machinery of the propellers. This, of triple-expansion character,

ncludes a cylinder of 112 inches, with a stroke of six feet, and is capable of producing an effective horse power of 8500. Many more strange and curious matters passed before the eyes, or were told by the courteous *cicerone* who showed the party over. Indeed, there was so much to inspect and to attract that, in some degree, photography was for the moment given second place; none the less, over one hundred views were obtained, not only on board the ship, but of various portions of these vast docks where the leviathan liners snatch a few days' rest between their twenty-five thousand miles out and home ploughing of the seas. Nor did the Thames side fail to offer a number of shipping scenes, which challenged the hand camerist to exhibit his skill.

North Middlesex Photographic Society.—On Monday, July 22, Mr. F. W. Cox, the Hon. Librarian, lectured on *The Life of Turner*. He described the times of Turner's youth, the state of London then, and the employment of the boy artist. He briefly sketched the history of water-colour painting from its origination with the early topographer, and showed its influence in carrying the art to a consummate position never before dreamed of. He described Turner's early Academy honours, and his coming to the front at a time when landscape art required a genius to advance it. After speaking of Turner's character and general appearance, he referred to his ambition in seeking to rival the old masters as well as his contemporaries in art, and illustrated his remarks by a number of engravings and some able drawings by himself from Turner's work, ranging over a period of forty years. The lecturer gave examples of Turner's failure as a prose writer, poet, and lecturer, and showed that his power lay in expression by means of the brush and his enormous industry. Reference was made to the ignorance of the critics which roused Ruskin to eulogise the artist, and mentioned that the one great object of charity which clearly dominated the artist's life—viz., to found an institution for decayed artists—was thrust on one side by the Court of Chancery, and a large portion of the artist's fortune went to feed the rapacity of the lawyers. In conclusion the lecturer said that Turner all his life long laboured for his art, for fame, for money, with success, and, if his strange and complex character, his self-absorption, and unconciliatory habits prevented his ever making a true friend, and isolated him from many social pleasures, landscape art to-day was the better in consequence, as it caused him to concentrate his whole energy on his one dominant faculty, the power of expression by means the brush.

South London Photographic Society.—At the last ordinary meeting, held at Hanover Hall, Peckham, Mr. A. Fellows in the chair, Mr. G. H. Moss read two papers—*On the Preparation of Collodio-chloride Paper*, and *On the Preparation of Plain Salted Silver Paper*—and fully described his apparatus and methods of coating. Some criticism as to the formulæ took place. By the courtesy of the Paget Company, samples of their collodio-chloride paper were distributed for trial by the members.

FORTHCOMING EXHIBITIONS.

1895.		
Sept. 23	*Leeds.	G. Birkett, City Art Gallery, Leeds.
,, 23–28	*Westbourne Park Institute.	
,, 24	*Royal Cornwall Polytechnic Society.	Edward Kitto, The Observatory, Falmouth.
,, 30–Nov. 2	*Photographic Salon.	Alfred Maskell, Dudley Gallery, Piccadilly.
,, 30-Nov. 14	*Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
Oct. 28–Nov. 2	*Southport.	G. Cross, 15, Cambridge-arcade, Southport.
Nov. 19–21	*Hackney.	W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 28–30	*Leytonstone.	B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

FAULTY PLATES.

To the EDITOR.

SIR,—In answer to M. C. H. Hewitt's letter in last number of THE BRITISH JOURNAL OF PHOTOGRAPHY, "Faulty Plates," I suppose he does not expect an answer from the manufacturer any more than I do myself. As soon as you put their nose into one of their own faults or defects, they are as silent as a dead fish. The trouble Mr. H. C. H. had with one dozen of 10 × 8 plates I had myself, with a quantity of dozens of the same size, and I ascribed it to a defect in the drying of the plates. When a negative, after washing, is put on a drying rack, and then *reversed* when only half dry, the same effect will appear.

At that time I ordered twenty-four dozen of plates, but wanted two dozen first as trial. The two dozen arrived and showed the defect, and I refused the others, but asked the manufacturer (a very well-known and old-established London firm) to send me other plates without the markings. This was cheerfully admitted, and, in due time, I received the twenty-four dozen of 10 × 8 plates, paid for them, and found when using them that three-quarter of the lot had the markings. What could I do then? Grumble!—I am, yours, &c. A. LEVY.

Asnières (Seine), July 19, 1895.

FORMALIN.

To the EDITOR.

SIR,—In your issue of June 28, Mr. R. H. Cunningham gives some very timely words of warning to those using "Formalin." Lately, while experimenting with this chemical, a few drops got, unnoticed by me, between my fingers. At first I did not know to what to attribute the funny greasy sensation I experienced on the affected parts, but imme diately upon discovering the cause I washed my hands. The solution was concentrated, but was only on my hands about three minutes, which was, however, long enough to leave its effects. The next day I had occasion to dip my hand for a few minutes in water, and then the affected parts shrivelled up in such fine hard creases that it seemed as if I had sand between my fingers. Upon drying my hands the sensation gradually grew less marked. Should this chemical come into general use among photographers, many cases of its injurious effects are sure to follow.—I am, yours, &c., MILTON B. PUNNETT,

St. Louis, U.S.A., July 16, 1895. *Chemist M. A. Seed D. P. Co.*

"TWO SUGGESTIONS."

To the EDITOR.

SIR,—There are two things I have not yet seen, which would be useful to photographers. Perhaps some of our manufacturers who see these lines may give the matter their consideration.

The first idea is an addition to the large finders which are fitted to such hand cameras as are provided with rising fronts, and consists of a movable frame defining the limits of the picture on the finder, and a divided scale to mark its position. There is also a corresponding scale in proper ratio on the rising front, so that the amount of foreground can be arranged by the finder and the rising front set to correspond.

The second idea is for an album which will properly protect the prints. When one has been at a great deal of pains to produce a first-class print, and has duly inserted the same in an ordinary album, it is very annoying to find, after the lapse of a few months, that, owing to the flexibility of the back of the album, the prints slide one upon another and damage the surface, matt prints becoming shiny or dirty, and glazed prints dull in patches, and any slight cockling aggravates the evil.

Now, if the leaves of the album were arranged on the slip-in principle, but each consisting of two *thick* sheets of cardboard with a third thick spacing board in between, then the prints could be rolled flat if necessary, and when slipped into place would be kept from touching each other by the thick boards, and so escape mechanical injury. Framing and glazing is, of course, more effective but expensive, and takes up a lot of space on the walls, so that an album on these lines would probably supply a want.—I am, yours, &c., H. HOLCROFT.

Parkdale, Wolverhampton.

"COSMOS" AT THE CONVENTION.

To the EDITOR.

SIR,—I must protest against the statement of dear old "Cosmos" (*vive* "Cosmos!" may his shadow never be less!) regarding the papers read at the Convention: he says they only excited languid attention; as a matter of fact, the attendance every evening for the papers was larger than at any previous Convention, so our genial friend "Cosmos" is hardly right, and I being placed where the whole of the audience could be seen could not trace any sign of that languid attention such as "Cosmos" noticed. "Cheer up, 'Cosmos.'"—I am, yours, &c. THE HON. SECRETARY.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

First-class interior and exterior backgrounds. Wanted, 8 × 8 feet for portrait and landscape lenses.—Address, NICHOLS, photographer, Stamford.

Will exchange 12 × 10 box camera and good portrait lens, French make, for good half-plate set.—Address, SIDNEY, 35, Richmond-road, Dalston, N.E.

Wanted, half-plate "Eclipse" camera or lens. Exchange quarter-plate "Eclipse," complete, and cash.—Address, SANDERS, 101, Goldhawk-road, Shepherd's Bush, W.

Will exchange cushion-tyred safety bicycle, ball bearings, for half-plate camera, complete or otherwise.—Address, A. H. PIEJUS, 152, Broadhurst-gardens, West Hampstead, London.

Wanted, 8½ × 6½ wide-angle and 6½ × 4¼ rapid rectilinear lenses by good maker. Exchange Ross's *carte-de-visite* portrait, Turton's cabinet ditto, or a French cabinet lens.—Address, E. PENFOLD, Bampton, Devon.

Will exchange a pair of Raymond's, extension ball-bearings, skates, with a second-hand half-plate French portrait lens, for a hand camera, quarter-plate or 4 × 5 preferred.—Address, S. T. ABRAHAMS, 6, Exeter-street, Plymouth, Devon.

Kodak No. 1, Kodak No. 3, Junior, or Perkens' quarter-plate instantaneous shutter, offered in exchange for several quarter-plate book-form dark slides and long extension quarter-plate camera for copying.—Address, Mr. TAYLOR, 2, Powis-place, Queen-square, W.C.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

ELLAR (Glasgow).—We have no recollection of such an article.

ALBERT LEVY.—It will be better to send us a small portion of the print.

M.—Your English apparatus will answer as well in France as in England.

R. A.—Let the slot for the diaphragms be cut one-third nearer to the front lens than to the back one.

W. G. S.—Adams & Co. make a finder by which an unusually great degree of luminousness is imparted to the image.

AJAX.—After sodium sulphite has been exposed to the air it becomes sulphate of soda, for which there are medical uses.

STUDIO.—Dark blue will do for D. D. and a good quality of muslin for C. C. Dark blue or green will do for the curtains.

JAS. H. CROSSLAND.—See JOURNAL for June 8, 1894. Penrose & Co., Baker-street, Clerkenwell, supply all the materials for photogravure.

A. DEWEY.—If your camera front was publicly shown and described previous to the date of the patent, the latter would be injuriously affected by it.

A. G. LEWIS.—A rapid wide-angle rectilinear of about fifteen inches focus, or a meniscus landscape lens of similar focus, should answer the desired purpose.

NEMO.—For pure black-and-white subjects there would be no advantage in employing orthochromatised plates. With coloured ones the case will be different.

H. MANSELL.—1. *L'Amateur Photographe*, 21, Boulevard St. Germain, Paris. 2. Probable cost, two or three shillings per insertion. You can remit by English P.O. 3. They would probably translate for you.

W. LAWS CANEY (Natal).—We, along with several others to whom we have shown the photograph, feel interest in it. The probability is that, by prosecuting the research still further, more may arise out of it.

T. R. (Antwerp).—If you explain at the Custom House the nature of the plates, and that you will open them in a red light, you will have no difficulty. The Customs officers are now familiar with photographic plates.

W. H. G.—1. The aperture engraved on the mounts of the anastigmat lenses exceeds considerably that which would be the intensity equivalent were the English system of measurement adopted. 2. We would prefer the symmetrical mentioned.

R. H. B.—Your query is a purely commercial one, and one we decline to deal with, except to surmise that you will get no discount at all, neither are you entitled to any. You are an amateur, and give your work away; but why should dealers charge you less on that account?

C. B. J.—To photograph within the precincts of Windsor Castle permission is required. We are not quite sure who is the right party to apply to for the State Apartments, but if you write to the Lord Chamberlain's department you will get every information with regard to all parts.

J. O. (Burton).—Dissolve forty grains each of the iodides of ammonium and of cadmium, and twenty grains of bromide of cadmium, in a minimum quantity of alcohol, and add to twenty ounces of the collodion. You may make it as dark as you like afterwards by adding a crystal of iodine.

S. POWELL.—The spot is a very pronounced case of flare spot. If the lens is a portrait combination used with a small diaphragm, it will almost invariably flare when employed outside; but, if it be either a cemented rectilinear or a single achromatic landscape lens, it can be cured by altering the position of the diaphragm.

DURHAM.—The portrait lens will, of course, be much the quickest, but it will be somewhat cumbersome for a hand camera, and, moreover, it will require stopping down to obtain marginal definition on the quarter-plate, so that there will not be much gain with it over the rectilinear, unless its use is confined to smaller pictures.

T. PELL.—So far as we are aware, no photographer has laid down an installation for the generation of electricity where the current is available from the mains, and it is a little unlikely that he would do so. We know that some houses in London, who had their own plant, discarded its use as soon as they could get the current from a public supply. In some suburban and provincial districts, the current is not on in the daytime; therefore, if the light is required at all times, a dynamo and engine must be installed.

J. KINSLEY.—The person who pays you for taking his photograph has no right to the negative. It belongs to you, but you cannot make use of it unless by his permission, whereas he can send one of your prints to an enlarger, and have as many reproductions of it made as he chooses. You have no claim. The copyright belongs to him.

M. REID.—The only way to obtain methylated spirit free from mineral spirit, as formerly, is to procure a licence from the Excise department to purchase it. Then you will have to get it direct from a methylator. Even if you have the licence, you will not be able to get it from the local oilman or chemist. What the druggist told you is perfectly correct.

H. HARRIS.—There would be no novelty in a stereoscopic hand camera. There are several of them in daily use. If you have some specially novel form that you can introduce, it may form the subject of a patent. But you cannot patent the mere application of a hand camera for stereoscopic work. Possibly, however, your letter does not really convey your meaning.

S. SMITH.—We cannot give the desired information. We remember that some time ago some one, whose address we do not remember, advertised that he did that class of work; but, as the advertisement has been discontinued for a long time, we surmise the business has also been discontinued. Why not do it yourself? Messrs. Marion & Co., if we mistake not, supply all necessaries.

S. E. T. writes, asking what are the general rules with regard to annual holidays for photographers' assistants. How long is usually given different grades, from operators downwards?—There is no rule. Some photographers give a longer time than others, and some none at all. It is generally a matter of arrangement about holidays between employer and employee at the time of engagement.

J. W. asks: "Can you tell us the cause of the yellow spots on the enclosed prints? You will observe that the spots are on the face of one of the prints and on the back of the other."—The yellow markings are due to imperfect fixation. Either the bath was too weak, the time of immersion too short, or, what is more probable, the prints were allowed to stick together while in the solution, so that the hyposulphite could not have free action.

MILTON B. PUNNETT (St. Louis) asks: "Where can I obtain 'Papyroxyline,' that is, pyroxyline made from paper? Does it yield a tougher film than the pyroxyline made from cotton?"—We know of no one in America that makes papyroxyline, but presume that any one who makes pyroxyline would make it to order. If it were ordered from this country, there would be great difficulty about the carriage, owing to the restrictions of the railway and steamboat companies. As a rule, papyroxyline does yield a tougher film than pyroxyline, but much depends upon its preparation.

A. H. PIEGUS.—1. We know of no combined toning and fixing bath which will yield good tones on gelatine papers that does not contain lead, or alum, or both. See article on another page. The combined toning and fixing bath which used to be employed many years ago for albumen paper contained hyposulphate of soda and gold only, but that bath would not be suitable for emulsion papers. 2. Better use the formula supplied with the plates you employ, treating them as having received a minimum of exposure. What may be the "most powerful developer" for one brand of plates may be very unsuitable for another kind.

L. S. A. says: "I have seven pounds and a quarter of residues from gelatine paper—ashes and sulphite from the combined bath. What ought I to get for them? My reason for asking is that I have received so little hitherto when I have sent them to the refiner. Should I get much more than if the residues were from albumenised paper, and how much?"—The residues contain far less silver, weight for weight, than if they were from albumen paper. A considerable portion of the weight is made up of sulphite of baryta, with which the paper is surfaced, as well as lead, if that were employed in the toning bath. It is quite impossible to say what return should be made for the waste without an assay.

LIONEL TAYLOR says: "I send you two prints on Ilford matt P.O.P., toned and washed and fixed according to their printed instructions. They have a very decided mealy appearance, the cause of which I cannot make out. I have used over 150 sheets of this paper, but have never had the same unsatisfactory results. I should be obliged if you could tell me the cause of it. I used the same dishes that I always did, and was very careful of thorough washing in all the stages of toning and fixing. All the batch were affected like this, more or less. You will see that the half-plate is more so than the whole-plate?"—The prints have the appearance of having been washed, prior to toning, in dirty water, such as the dish being contaminated with hyposulphite of soda. We have very little doubt that that is the source of the evil.

CONTENTS.

	Page
PREPARING DRY PLATES IN DAYLIGHT	481
THE BATTLE OF THE BATHS	482
FOCUSSING WITH NON-APLANATIC LENSES. By W. E. DEBENHAM	483
PHOTOGRAPHY IN COLOURS. By E. J. WALL	484
SOME ASPECTS OF MODERN ILLUSTRATION. By GLEESON WHITE	484
RESIDUES FROM P. O. PAPERS. By J. PIKE	487
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—VIII. By T. N. ARMSTRONG	488
LABORATORY NOTES AND NCTIONS. By E. BANKS	489
TESTS FOR SODIUM THIOSULPHATE. By MATTHEW WILSON	490
PROCESS ENGRAVING	491
THE CAMERA AND ITS ADJUSTMENTS. By WALTER C. BOYCE	492
EXHIBITION AT THE ROYAL AQUARIUM	493
OUR EDITORIAL TABLE	493
NEWS AND NOTES	494
RECENT PATENTS	494
MEETINGS OF SOCIETIES	494
FORTHCOMING EXHIBITIONS	495
CORRESPONDENCE	495
EXCHANGE COLUMN	495
ANSWERS TO CORRESPONDENTS	496

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1840. Vol. XLII.—AUGUST 9, 1895.

LANTERN PROSPECTS.

It is usual at this time of year to cast one's eyes forward to lantern prospects. The great question now before us is not one relating to the technics of photography as applied to the lantern, for this is now fairly well understood, but of devising the means of procuring light.

Unfortunately one cannot cast his eyes around the placards which abound at so many of our great railway termini without being made aware of the restrictions now in force as to the transmission of gas cylinders by railway—restrictions by which numerous towns and villages, as well as private residences at a distance from centres of supply, are compelled to remain in a condition of darkness so far as this condition is made dependent upon having their oxygen brought to them compressed in cylinders.

The limelight has come to stay, and few will care, for public exhibitions at any rate, to revert to oil lamps as the source of illumination. What is to be done? That is the query with which we are being met.

Were we inclined to advocate mal-ethics as applied to absurd railway by-laws, we would advise the bringing away from town the gas cylinders in one of those elongated carpet bags so well known as having been devoted to the service of cricketers, and which will easily contain a cylinder of forty feet capacity; but, as it is *contra bonos mores*—at least, up to the time of writing this article, whatever it may be next week or next month—it would be wrong for us to advocate this or anything like it, even the placing the gas bottle in one of those little trunks sacred to the carrying of a baby's change of clothing. After all, is this, viewed from a strict ethical standpoint, any more reprehensible than a snap-shottist going among the multitude with his engine of destruction, taking off heads, expressions, and attitudes by means of an instrument, it may be, disguised as a brown-paper parcel? We think not.

The late Fenchurch-street railway explosion has terrified the railway companies for the moment, but they will soon recover their heads again.

But, as a wise general always contemplates and provides against the possibility of a retreat, so is it well that photographers may assume that railway companies may still continue in the practice of their "no-gas transmission" for a few more months than is now anticipated.

It was not such a very difficult matter in the pre-compressed oxygen days for each limelight operator to make his own oxygen immediately previous to its being used. The chief *impedimenta* difficulty lay in the trouble of its being necessary to carry with him a gas bag and an oxygen retort, together with crushed chlorate of potash and oxide of manganese. The mere making of oxygen is very far from being a difficult matter. It only suffices to place a measured quantity of the chlorate and oxide in the retort, with a lighted Bunsen or other burner underneath, when the oxygen is freely given off, and, passing through a wash bottle, enters the bag, which, when full, is detached, and is ready for use. Without going into details at present, this system, if things remain as they are, can be had recourse to again, and the well-recognised ingenuity of present-day photographers will soon devise means for its simplification.

We have seen in practical operation means by which the evolution of oxygen from the raw material was made concurrently with its being used, so that all that was necessary was to put a match to the heating lamp a few minutes before the exhibition commenced, when the oxygen would be supplied to the burner under perfectly automatic conditions, the supply being greater or less according to the demand made for its continuance, no gas bag being employed. This, we think, is, next to its being supplied from a cylinder, one of the best things we have yet seen.

As for the hydrogen, this is not a difficult thing to supply. Few places there are now in which common gas is not laid on by the mains, and, even were it not, reasonably good substitutes for it are to be found in improved alcohol lamps, which, although inferior to the oxyhydrogen light, are so only in a small and, in many cases, an unrecognised degree.

In this somewhat hasty and incomplete generalisation we have attempted to show that, even if the railways still persist in their unwise attempts to stop the transmission of oxygen in a compressed state, the photographer need not wholly despair. We have, however, left out of sight all reference to electric lighting, which is fast becoming a most potent factor in powerful artificial illumination. When this attains its full measurement of development, whether direct from the electric mains or through storage batteries, then, we imagine, it will—even the limelight, beautiful and convenient—pale "its ineffectual fire" before the presence of this potent revolutionary, which is so rapidly making its presence felt. The railway companies may, on account of fancied dangers, still object to the transport of compressed gas in cylinders; they will scarcely do so in the case of storage batteries.

A POINT IN THE USE OF CARBONATES IN DEVELOPMENT.

I.

THERE can be little doubt that, for general purposes, except perhaps in conjunction with hydroquinone, carbonate of soda forms the most convenient alkali to use in development, although not a few photographers are to be found who still adhere to pyro and ammonia as being at once the most energetic and the most manageable developer. In fact, it is boldly asserted by many that pyro and ammonia will bring more out of an exposure than any other modification of the alkaline developer yet introduced.

Although we are not prepared to go to that length, as we are strongly of opinion that, so far as the mere production of detail is concerned, some of the newer developers, notably metol, are more searching in their action than pyro, still we readily admit that there is a good deal yet to be said in favour of pyro and ammonia, and we think none of our readers will disagree with us in saying that it is infinitely superior to pyro and soda in bringing out feeble details in cases of under-exposure as well as in general adaptability under every kind of abnormal circumstances. While we have ourselves long recognised this fact, it is only recently that the explanation has taken a definite form, and we intend to call attention to a point in connexion with the use of the carbonates in development that, so far as we are aware, has not been publicly noticed or commented upon, but which goes far to explain not only the differences in action between the caustic and carbonate alkalies, but also some other anomalies in the behaviour of various forms of developer.

More especially will this explanation make clear some of the irregularities so frequently observed when the modern practice is followed of using the same solution for repeated successive developments, a practice that we have always endeavoured to discountenance, although, under favourable conditions, we must admit it is often very convenient, as well as economical; but, in following that practice ourselves, we have met with such grave irregularities in behaviour—variations, be it clearly understood, that could not be set down to the mere fact that each successive development introduces a little more restraining bromide into the solution—that we have for some time entirely relinquished the use of the same solution for even a second time, whereas we have often developed five or six plates, one after the other, in the same solution without any appreciable difference in the final result, although, as a matter of course, the action became gradually slower; this also, it should be remarked, when the volume of solution was no more than necessary for a single plate. It was, in fact, the uncertainty of the probable action of the solution when so employed that compelled us to give up the practice, but we are now able to clearly account for all the uncertainty and irregularity, and to explain why at one time we have succeeded, and at others failed.

The sole reason of the difference lies in the character of the alkali employed, whether carbonate or caustic. In our practice, experimental and otherwise, we are necessarily constantly employing different variations in development, not only as regards reducing agent but also as regards alkali. When, some two years ago, we first introduced the combined metol and hydroquinone formula that has given so much satisfaction, we specially alluded to the power it gave in the direction of repeated development, and at that time we largely used it in that way. But at that period we were employing caustic ammonia as the alkali, and, though this, by reason of its volatility, necessitates frequent fresh additions as development proceeds, it is perfectly easy to so regulate the additions so that uniformly satisfactory results are obtained.

Later on, we worked the same combined formula, but substituting at various times carbonate of soda, carbonate of potash, as well as sodium and potassium hydrates; and it was then that the irregularities in action which we have mentioned commenced. But it is only quite recently, when working in the laboratory of a friend and using pyro and soda, that the anomalous behaviour became so great as to require some explanation. Two plates had been developed in the same volume of solution—more than ample quantity for two or three plates—when, on attempting to develop a third, the solution entirely failed to work, although a fresh quantity of alkali nearly equal to that originally employed was added. The sky line of the picture alone was visible, which sufficed to prove that the plate had been exposed; so the used solution was poured away and a fresh one applied, when the image came up quickly and vigorously, as if nothing had happened.

The friend with whom we were working was in the habit of mixing up a certain quantity of developer sufficient to develop, say, half a dozen plates, and using this until done with. Pyro and ammonia was his usual developer, but on this occasion, having no fresh ammonia handy, carbonate of soda was used, with the result already mentioned, and his statement of his system sufficed to supply the clue not only to the failure above alluded to, but also to previous irregularities. The cause was, in short, the substitution of carbonate for the caustic alkali.

If we consider briefly the action that proceeds in development, the reason of the difference will be immediately clear, and, although it is to a certain extent what might be expected, we must confess to a feeling of surprise at the degree of difference. Let us take, for the sake of illustration, a mixture of, say, pyro and caustic soda, ignoring, as not affecting the chemical argument, any sulphite, bromide, or other ingredients that may be present. Upon applying this to an exposed plate the pyro is oxidised at the expense of the developing solution, the silver in the exposed portion of the film is reduced, and the bromine eliminated combines first of all with the hydrogen set loose to form hydrobromic acid, which in turn seizes an equivalent of the soda to form bromide of sodium, thus:—

$$HBr + NaHO = NaBr + H_2O.$$

In other words, each atom of bromine evolved from the film produces an atom of bromide of sodium and an atom of water, reducing the strength of the developer at the same time by one atom of sodium hydrate.

If, now, we substitute for the caustic soda an equivalent of the carbonate, or rather if we employ a solution of the carbonate of equivalent developing value, the result is slightly different, or, we may say, *very* different:—

$$HBr + Na_2CO_3 = NaBr + NaHCO_3,$$

or, in other words, an atom of bromide of sodium is formed as before, together with an atom of bicarbonate of soda; but this is not all. In addition to the atom of sodium hydrate abstracted from the solution as in the previous case, another atom is converted into bicarbonate, which, as was shown in the course of a recent discussion of the subject, is not only useless as a developing agent, but is actually a restrainer; and how strong its restraining influence is is shown by the result

of the experiment quoted above, as well as by others undertaken since.

The equation just given shows the action in the presence of excess of sodium carbonate, but in the case of a nearly exhausted developer, so far as concerns alkali, the result would be as follows :—

$$2\,HBr + Na_2CO_3 = 2\,NaBr + H_2CO_3,$$

or, supposing the carbonate to be nearly exhausted, the carbonic acid would be liberated, and would remain in solution in the free condition at ordinary temperatures, and would only be driven off by boiling. At any rate, whether the carbonate be in large excess or nearly exhausted, the practical result is the same, that for every atom of bromine liberated in development, in addition to the formation of fresh restraining bromide, there is a double weakening of the developer, and an extra restraining action caused by the presence of either bicarbonate of soda or free carbonic acid.

VARNISHING DIFFICULTIES.

It is not one generation removed since the time when gelatine dry plates were not; yet a large body of workers exists to whom the mysteries of wet plates are a hidden secret. We have, in a series of articles a little time ago, done our best to reveal the arcana, but there is one point upon which it is evident, judging from the letter of "Puzzled" in our correspondence columns, more light may be thrown. The more is this true from the fact that it is the march of progress that has brought about the difficulty for our correspondent. There had evidently been a negative on the pieces of glass received, but the greater part was dissolved away. All old workers in the collodion process have at one time or another experienced such a trouble, but it is rare that it happened in so severe a form as in the case brought before us. Usually the giving way of the film under the application of varnish was owing to the employment of a collodion made with a very "powdery" pyroxyline, and the application of a varnish made with a spirit very free from water. This was the explanation that at first we were inclined to offer, but further inspection brought to light a very different cause. The faint, peculiar smell of the plate showed that it had been varnished, not with a spirit varnish, but with the less known celluloid varnish. This, as every one who has used it must be aware, has amyl-acetate as the liquid ingredient, and it needs no argument to show that the liquid capable of dissolving celluloid must very easily liquefy the slight and porous collodion film of the wet plate.

In view of the increased use which is likely to be made of this new varnish, we have thought it worth while to draw special attention to the impossibility of utilising it for collodion negatives, wet plate or emulsion. It is true that, by giving a wash with solution of gum arabic or dextrine to the negative while wet, a coating of the celluloid varnish might be given, but it is not worth the trouble unless the negative is likely to be exposed to a great heat, as, for example, in near proximity to an arc light. In view of the frequent occasion for great dispatch, and this mode of illumination being employed, the celluloid varnish would be admirable, following, of course, the coating of gum or other surface insoluble in the amyl-acetate.

Another alternative is the use of amber varnish, made by dissolving amber in chloroform, a solution which at one time was held in great repute, but, on account of its expensive character, gradually fell into almost complete disuse.

It may, however, be pointed out that there is a distinct advantage in the use of a varnish of a spirituous nature. It fills the pores of the collodion, makes a homogeneous coating, giving a greater transparency to the shadows, and imparting a quite distinctive character to the film so treated. We have on previous occasions given a formula for compounding a good varnish, which need not be here repeated, except to say that a ten or fifteen per cent. solution of best amber-coloured shellac in methylated spirit will answer all ordinary purposes, though some prefer the admixture of sandarac to the extent of one-tenth to one-fourth of the shellac used. It makes the solution lighter in colour, but we see no other advantage, except perhaps the increased brilliancy of surface it imparts.

We are of opinion that it reduces the hardness of the protecting film. If any one will make, say, a ten per cent. solution of sandarac in methylated alcohol, and coat a piece of glass with it—by heat in the usual way—he will find that the coating of varnish, when quite cold, can be scratched with the greatest ease by the finger nail. It is easy to see how probable it is that the same want of tenacity may be imparted to the shellac coating by the admixture of this comparatively "rotten" resin, although it is true that the qualities of a mixture of resins are not necessarily a mean of those of the components, an action something akin to that of an amalgam in the case of metals taking place.

Finally, we may say that, where no facilities or time can be spared for varnish-making, the plan may be adopted of diluting with spirit a good quality of "brown hard varnish," which is to be purchased at most drysalters'.

Photographers and Geographers.—Photography, as might have been expected, was much in evidence at the Geographical Congress, which finished its sittings on Saturday last. One of the most interesting lectures was that of Professor W. Libbey, which was accompanied by a number of photographs that he had obtained in the north of Greenland, the Sandwich Islands, and in different parts of America. Not the least, perhaps, interesting of the business was when Herr Andrée gave the outlines of his plan to reach the North Pole by a balloon. It will be remembered that a few weeks back we referred to the scheme, and mentioned that the aeronaut estimated that 1700 or 1800 cylinders of gas, under a pressure of from one to two hundred atmospheres, would be required for the balloon. At the Congress details of the plan were given, and the originator of it mentioned that, as the sun would continually light their way, photographs could at any moment, night or day, be taken of the earth below, and that the guide ropes that were to trail the ground would steady the balloon for taking them. Evidently, from the discussion which followed, those who were present were by no means unanimous in their opinion as to the success of the undertaking. One member even characterised the expedition as "foolhardy." However, Herr Andrée, in his reply, said he had got the money for the expedition, and he would make the attempt. The result will be looked forward to with interest in the scientific world generally.

Another Patent for Colour Photography.—Amongst the complete specifications published on Saturday last is one for producing photographs in colour, the patent being taken by Mr. Mathieu. The method is this: Three negatives are taken on plates specially sensitised, respectively for blue, red, and yellow, colour screens being used to cut off the rays not required in the different negatives. When the negatives are finished, they are printed on three different coloured "carbon" tissues, the colouring matter of one being chrome yellow, one Prussian blue, and the other carmine. The three prints are then developed on glass plates that have previ-

ously been waxed to allow of the films being removed after drying. After the prints are dry, a piece of transfer paper is applied in the ordinary way to the yellow prints, and allowed to dry. It is then stripped off. Next, it and the blue print are placed in a warm solution of gelatine and adjusted in position on the glass plate and squeegeed down, and then allowed to dry. The compound print is then stripped off as before, and immersed with the glass bearing the red print in a solution of gum arabic, adjusted in position and squeegeed together. After drying, the whole is removed from the plate, the three coloured prints being superimposed to form one picture. The method is very ingenious. But it would be interesting to learn in what particular consists the novelty, and wherein the method differs from that patented by Ducos Duhauron nearly twenty years ago. It is a curious coincidence that the pigments given for the three tissues in the recent specification are the very same as those given in the specification of Duhauron, namely, chrome yellow, Prussian blue, and carmine. The process has not been worked commercially since it was first introduced, and it will be interesting to see whether its reinvention and second introduction will be more successful.

Vignetting Developed Positives.—We frequently receive inquiries on the subject of vignetting developed positives on bromide paper or opal, and this seems to form a considerable difficulty with a large number of amateurs. The reason is not far to seek, for not only does the use of artificial light render the use of a vignetting mask more difficult, but the gradation produced by development, as all who are familiar with enlarging are aware, is too sudden to be pleasing when the ordinary screen, or even a perfectly graduated vignetting glass, is used alone. The scale, in fact, of the developed image is too short to give delicacy, and other means must be resorted to. In order to overcome the objectionable sharpness of edge when using a mask with artificial light, it will suffice to throw the light upon a white reflecting surface, such as a sheet of white cartridge paper, and to expose the printing frame directly to that at a fixed distance, and cutting off all other direct rays of light. In this manner not only is a beautifully soft diffused light obtained, but it will be found easier to regulate the exposures accurately than when using the direct rays from a lamp, gas flame, or the electric arc, though the last, as well as daylight, are almost out of the question with the quick films of the present day. In addition to this, some means will have to be adopted to increase to softness or lengthen the scale of gradation given by the developer, for, if a vignetting mask be used that would produce an exquisitely soft vignette upon printing-out paper, it will give but an unsatisfactory result under development. The method adopted in enlarging is easily followed, for, if the printing frame be fixed to an upright support at a fixed distance from the reflecting surface, it is an easy matter for the operator, with both hands at liberty, to devote his attention, during exposure, to keeping the vignetting screen in motion, so as to increase the degree of softening. Of course, some little experience will be necessary before the requisite degree of skill is attained; but the operation is not, after all, a very difficult one. It is needless to say that all extraneous light must be prevented from falling upon the printing frame, for which purpose it may be enclosed in a deep box, to shade it from side rays. The vignetting screen also may be attached to a sort of tramway, and moved backwards and forwards by means of rackwork or other mechanical arrangement, in which case there will be less chance of unevenness in the shading. The screen may be of cardboard, with either plain or serrated edges, or may consist of one of the ordinary vignetting glasses. The latter will give the softest result with the greatest ease, and the size of the vignette can be varied by altering the position of the screen with regard to the negative.

Photography and Fortifications.—Reference has frequently been made to the inconveniences that have arisen to English tourists who have incautiously, though innocently, used their cameras abroad in the neighbourhood of fortifications. We have frequently cautioned our readers as to the risk they run in photographing anywhere in the vicinity of forts, even if they are not seen from the spot, especially on, say, the Franco-German frontiers. Foreign laws are very stringent on the point. It may not be generally known here that our own regulations on this subject are equally stringent, though they are not often put in force. Last week, however, they were. It seems that at Fort Bovisand, near Plymouth, those on guard noticed a party of gentlemen, one of whom was in the act of taking a photograph of the place with a hand camera. The matter was promptly reported to their superior officer, who at once ordered the party to be brought into the fort to give an explanation for violating the Queen's regulations. The visitors were conducted into the fort, where they were detained, after having their names and addresses taken, till the arrival of a police constable of the Devon County Constabulary. The constable, acting under the instructions of the officers in charge of the fort, conveyed the gentlemen, with a military escort, to the police station at Stonehouse. There they were received by the superintendent, to whom they explained the whole affair. It appears that the party consisted of three Englishmen, the French master at the local school, and three Frenchmen who are studying English in the vicinity. After this explanation, and their names and addresses again being taken, they were allowed to go. The commanding officer of the fort will make a report to the general commanding the Western District, and it is understood that no further action will be taken by the police until the decision of the military authorities is made known. Probably no more will be heard of the matter. It is stated that the Englishmen and Frenchmen were strangers to each other, and they had only just entered into conversation when they were arrested, and it was one of the Englishmen that was using the camera, and that makes it all the "rougher" on the Frenchmen. The details of the episode, as given by the different papers are not all in unison with each other, but the facts are, that the party *were* arrested, were taken to the police station, and afterwards were discharged; also that they must have suffered considerable inconvenience (it is stated that they were seven hours without food) and annoyance in the mean time. Whatever ultimate action, if any, may be taken, the incident suffices to show that Englishmen may subject themselves to the same inconveniences by photographing in the neighbourhood of their own fortifications as they may in photographing in the vicinity of those of other countries.

JOTTINGS.

THE holiday fever is like most epidemics: it distributes its attentions with the same impartiality as, for example, the influenza, attacking in its course all sorts and conditions of persons, and among them many who, from the nature of themselves and their circumstances, one might regard as unlikely to take the complaint. I myself am popularly supposed to be so much of a misanthrope, tempered by unneutralisable acidity, that to suggest the possibility of *my* succumbing to an attack of holiday fever may conceivably be equivalent to courting the deliberate doubts of my readers; but the possibility has already been exchanged for the accomplished fact, so that no room is left for doubt. I am really holiday-making, that is, enjoying, so to speak, a change of scene and occupation for a single week out of the fifty-two, and remitting for treatment at a future date a dozen topics of purely photographic interest, while, once in a way, I babble of green fields, and try to waft you a little of the scent of the hay to mingle with and sweeten the unentrancing odour of the printer's ink.

The intelligent reader, with the cleverness and insight of his species, may have divined that I am only subjected to a mild attack of holiday fever, and that, not to put too fine a point upon it, I am to some extent under an obligation to my inclination for afflicting me with the malady. Truly, such is the case. But, when, in the figurative sense, I close my eyes and call the imagination to my aid, the illusion seems replaced by reality; the camera case slung over my shoulder is almost evident to my senses, particularly in regard to the weight of its contents, and, as the train stops at the little station

under the green hill, I recall my satisfaction and surprise that no passenger but me alights, and I make my way towards the village in a clear and invigorating atmosphere, selfishly elated at feeling that I am in all probability the only photographic tourist likely to visit it to-day.

Across an open sweep of country, rich with a wealth of dark-green verdure and domed with a blue sky flecked with a bright yellow flocculence, my eye wanders with greedy admiration, and in a few hundred paces the entrance to the village is gained. The village green, with its duck pond encircled by a severely unornamental iron railing, opens out on my left. A quaint-looking little church, with a conical steeple, the few and fragmentary remains of a castle, and one or two decidedly ancient cottages skirt the green, from which a branch road, smooth and white, stretches into the distance. A speedy cyclist steals silently by, and one or two small brown children loll idly at the edge of the water, a woman in a white apron is seen at a cottage door, and there is a faint hum of insect life in the air, while the sun is at its zenith, and the scene glows in the soft light of early autumn.

But the village street, and not the green, is the great glory of the village. It straggles away from the green in the most admired irregularity, and, despite some traces of architectural modernity, still presents a total effect of typical English rustic beauty. It is lined here and there by antiquated cottages in various styles—the thatched, the wooden roofed, and the tiled. The diamond-paned windows, the crazy steps at the doors, the tumbledown but picturesque roofs, the delightful absence of order and symmetry in the construction and arrangement of these cottages, at once suggest many possibilities for the making of effective photographs. The children of the village are tractable and sympathetic; white-haired old dames, an occasional labourer, an earthy and mahogany-faced-looking waggoner and his team, spruce but "pictorial" young housewives, with or without babies—all these are found at hand in the course of an hour or two's sojourn in the village, ready to be turned to account in aiding one's efforts at picture-making.

As I stand with the green to my left and the village street facing me, I become slowly conscious that over and above its natural picturesqueness of grouping, and the incomparable charm of its old cottages, the village, with its background and fringes of trees, its soft reds and browns, is a marvel of lavishly beautiful colouring, and I have no further need to wonder that painters have long gazed with a loving eye upon it. Midway between its two limits is a smithy, the mere mention of which will, I know, conjure up visions of obvious opportunities of a branch of work in which the question of exposure becomes one of peculiar difficulty.

Another two hundred yards takes me to the end of the village, but before I get so far my camera—an' I so wished—could have been brought into play at least half a dozen times. Here the cottages stand well back from the road, being surrounded by trim but not formal gardens. I get a glimpse of a comely rut-lined field, guarded by lofty sycamores looking down upon some farm outhouses, and then, passing under overhanging trees and by another group of thatched cottages, I pause on a small stone bridge which crosses the river that races away from an adjacent mill, and, to the accompaniment of a tobacco smoke, I count up my exposures, and then leisurely amuse myself by studying the dreamy, drowsy fashion in which the inhabitants of the village move about, or by glancing aimlessy, but with latent interest, up and along the winding street and its well-broken-up distances.

The river draws me to it, as the river always does. The ugly mill is soon buried behind a traceried clump of trees, and, passing through the gate, I am standing looking down upon the tumbling waters as they roar away from the wheel. The river, which winds glinting and sparkling through the reeds and rushes, and here and there is almost lost to sight among the trees, is on my left, while on my right the mellow meadows stretch gently upward, dotted with placid cattle. Facing me is the open landscape, gorgeous in its luxurious August garb, with the serpentine river creeping far off to the dark clumps of trees. And here in perfect loneliness I fritter and laze the hours away, and at length come down to my last plate.

Stretched at my ease on the soft, inviting sward, I peer through the hedge backwards over to the village roofs among the trees, which are now casting quickly lengthening shadows. From my feet the ground curves gradually downwards towards the wayward little river. The hay has been gathered, but its fragrance still lingers among the short-cut grass. The lowering sun tips the tops of the belts of trees that dot the panorama before me, and the blue and distant ridges stand out crisp and clear. A wisp of smoke curls lazily up from a red-roofed farmhouse in the middle distance.

I fall to wondering whether the view before me is "photographic" enough for my last plate. Away beyond the curl of the river, every plane, right up to the softening distance, is perfectly illuminated and defined, and the clouds are grandly bold; but, ah! the little farmhouse is so far off, and my longest-focus lens is all too short for the purpose, I know. Then, the great sweep of foreground, unbroken by a shadow, would not render well, to be sure! And so I decide to save my plate, and I linger on until the red disc in the sky dips well behind the trees; and then a group of cattle steals silently up behind me, and stands in the foreground for me, breaking it up in the most perfect manner. I start to my feet with the intention of exposing my last plate, only to realise that the dusk has crept down, and that the stars are beginning to glitter. . . . . Then I pack up, and plod away, through the crisp night air, to the station.

I had almost forgotten to say that my village is Otford, in Kent.

COSMOS.

PRINTING OUT PAPERS IN PRACTICE.

THERE is no doubt whatever that the latter-day amateur is much better off for printing papers than his predecessor of the early seventies. To say nothing of the variety of the sensitive materials, the results are, as pointed out only recently in the JOURNAL, even from thin, weak, and (from an albumen point of view) unprintable negatives, very good indeed.

It is, however, rather rough on the tyro, that he should be so overwhelmed with such an assortment of directions, designed apparently with a view to demonstrate that these gelatino-chloride papers are all distinct chemical preparations. Why, otherwise but for a charming variety or frolicsome bamboozlement, should Brown give instructions so entirely antagonistic to Jones, and so remarkably opposed to Robinson. For my part, I think the great charm of P. O. P. lies in the fact that if you can't get Brown's paper, you can fall back on that of Jones, and, in the event of this failing, you may use that of Robinson with equal facility, and with a comforting assurance that practically identical results will follow. There is naturally a small amount of difference, as regards rapidity or sensitiveness, and possibly one paper may show on printing a different colour to that of another maker, but these are, after all, trifles, and we may take it as a fact that gelatino-chloride paper is what its name implies, and nothing else.

There is one crowning advantage, which, by the way, is not to be entirely and strictly conceded to the papers under question, but which has come to the surface as the result of *their* use more particularly; this lies in the fact that we are able, by means of development, to save proofs which come from the printing frame, accidentally or intentionally under-timed.

The fact that we are able to develop under-printed proofs, and by a simple process, merely the application of a modified form of developer, bring them up, quite up, to a level with others which have received full light impressions, is, I am afraid, rather lost sight of. This is a pity, for, apart from any use which could be made of the novelty in winter time and during dull printing weather, the method fully deserves consideration and trial on other grounds.

Printing-out papers have proved a great force with those of our workers who produce either from choice or want of skill, negatives

having a tendency to weakness, bearing in mind that the best of us have, on occasions, and in spite of tables and exposure meters, difficulty in getting quite the right density; much more satisfactory and brilliant prints resulting from the use of P. O. P. with such negatives than would be possible were albumenised paper employed.

There are negatives also which we find almost impossible to intensify; do what we will in reasonable practice, we cannot add much to their density, and they give what may be termed impossible prints in the ordinary way. I have such a negative now in hand, and I can recall many others which have passed through my hands of a similar character, pretty pictures, some of them, which I should like once more to tackle. Give this negative an average exposure, and the resulting print is a hopeless failure; but there is a stage during the printing of this plate when we can see a full amount of delicate detail, which, if we could secure and "fix," just as it is, would mean a still delicate, but quite passable picture, and this is possible and practicable by means of development.

I have on many occasions heard workers say, alluding to the colour and brilliance of a newly printed proof, just out of the frame, "how they wished they could secure that result just as it then appeared"—this is also possible and practical by means of development.

It may also be mentioned that "copies" may be improved by partial printing, followed by development. The rough grain may be considerably softened by a little judicious but not ostentatious "sunning," the action of the developer completing the work, a more generally harmonious effect being produced thereby.

My own experience in this work is that the Eastman *developing* formulæ may in all cases be followed, it is quite safe to use this, and it will be found quite reliable, no matter whose paper is in use. The formulæ have a foggy appearance, they *look* complex, but just make up liberal quantities of each solution, and, by the time these are ready and a little time has been devoted to their study, we shall find them quite reasonable and workable.

I have mentioned the *Eastman* developer, the formulæ for which can be ascertained from any dealer. With regard to the necessary *toning* bath, I suggest the use of the following (from THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC), which has certainly, in my hands, produced the best results.

Combined bath for toning:—

Water	20 ounces.
Hypo	5 „
Citric acid	60 grains.
Acetate of lead	60 „
Sulphocyanide of ammonium	240 „

the ingredients being added and dissolved in the order named; make a good supply of this, let it stand twenty-four hours, decant the clear liquor, and when required for use add to each ten ounces used one grain and a half of gold chloride. It is, I think, advisable to make this bath in quantity, two or more Winchesters at least, adding the new to the old, in fact "blending" the mixture as far as possible.

A set of prints, which have received variable exposures in the printing frame, should be carefully stowed away from unnecessary daylight until ready for treatment. I find it safer in daylight to work at a window screened with a yellow blind, or we may use a lamp or gaslight. Such proofs as are distinctly underdone, those also which we may judge are only doubtful and a trifle below the mark, are immersed in the developer, one after the other; keeping them moving about and carefully noting the changes which follow; they all weaken somewhat at first, gradually then in the course of a few minutes recovering density, regaining and piling up detail until fully developed. Much care will be exercised naturally to prevent those prints which only required the least addition of strength from being overdone; it is safe to remove these at once on recovery of their normal appearance. The print fades away to a pale yellow, then, still remaining yellow, gradually recovers itself until it shows all the detail but about half the strength of a finished print. A proof only about half printed, or even a quarter printed, will, of course, be left longer in the solution, the stage will arrive when all detail will be visible, no matter how faint the original impression may have been; wait until the yellow colour has become fairly strong, then remove to a bath, previously got ready, of water slightly acidulated with acetic acid. Prints, as developed, are dropped into this acidulated water, avoiding contamination by means of the fingers with developer, and are then to be washed for five minutes or so in several changes of water.

At this point we may take in hand the prints which we decided were properly printed; these should receive a preliminary wash in a bath of water by themselves. I invariably wash P. O. prints previously to toning. *Uneven* toning is, I notice, put down as often the result of *not* using a washing water prior to immersion of the print in the toning bath; at the same time, printed directions say, "Place the prints at once, without washing, into the bath." We shall be on the safer side if, in this case, we discard the directions, and take care that our prints are thoroughly limp and evenly washed before being put into the toning solution.

Toning proceeds evenly and uninterruptedly. Care must be taken, however, to ensure, as far as possible, a reasonable uniformity of temperature, and litmus paper should be used to test the acidity or otherwise of the bath. It has been pointed out more than once, lately, that, apart from consideration of the negative merely, upon the temperature of the bath will largely depend any loss of density and strength of colour in the prints. It is a fact that our work may be all rendered of no avail, from inattention to points of this kind, particularly at this season of the year, when, with warm fingers dabbling in the solution, the latter will rarely be below 60° Fahr. It is a sad waste of time to use the developing bath, bring the prints up to the mark, and then lose all our labour in the toning bath; but it can be done without care. On the other hand, how readily and easily we can rectify errors in the printing frame, and economise daylight, and otherwise even up a batch of prints. No doubt, where large numbers are worked, such precautions indicated would be carried out as a matter of course, in a methodical way, thus reducing risks to a minimum. The operator does not require to be a chemist, but he must be able to make up his solutions accurately, and use them with reflective intelligence.

From my own observation, I am inclined to think that those who experience trouble with regard to loss of tone and colour of their prints when working in the usual way might find it worth while to try a preliminary developing bath previous to toning, if only for the purpose of giving a little added strength, something to withstand the weakening action of the toning bath, always bearing in mind the necessity for caution as regards temperature.

Another point is worth mentioning, the decidedly more brilliant colour of the finished prints, the rich browns, sepias, and purples obtainable, if the operations have been carefully attended to. In other words, when such results are to be had for what is, after all, only a little extra trouble, it is only reasonable to suppose that considerably more than ordinary care and thought will be forthcoming.

J. PIKE.

TRIMMING AND MOUNTING PHOTOGRAPHS.

Too great stress cannot be laid on the importance of trimming and mounting the finished photographs in the best possible manner from artistic and workmanlike points of view. Some may consider the term workmanlike to include all other conditions, but in this article I make a distinction between them, limiting the artistic phase to the shape of the picture and the suitability of the pattern of the mount to which it is attached.

Suppose we have a 12×10 photograph to deal with, the most artistic appearance may necessitate trimming it down to half or a third of its original size, or perhaps even less than this, although the whole of the photograph may be technically perfect. With many photographers cutting off any part that is not defective is very reluctantly done, the ruling idea being to have as much subject to mount as possible. A negative on a 12×10 plate must not produce less than $11\frac{1}{2} \times 9\frac{1}{2}$ print, or even larger, even if a bit of margin has to be included to fill up the size irrespective of any detriment to the general effect of the subject. The shape is also of great moment in getting the best results. Much consideration is necessary before deciding to what size and shape the photograph must be trimmed. I have found it a very useful plan to lay the photograph on a flat surface and cover it with a piece of plain glass to keep it from curling, and then, by the aid of two L-shaped strips of cardboard shifted about over it, the best size can be readily ascertained. Oval, round, and dome-shaped masks of different sizes may be at hand, of which the effect can be easily tried until we are satisfied that we have selected the best of the subject. As a rule, any faults or damaged portions should be cut off unless it happens their removal would alter the general effect for the worse, their retention of two evils being the least. Generally a rectangular form is most suitable. A picture that will look well in another shape will look equally so if properly squared up. Oval pictures often have a good appearance, especially if the principal objects are limited to one part of the design, and not scattered equally over the subject. A vignetted picture of this kind lends itself particularly well to the oval form.

Circular prints are seldom so pleasing, although for certain subjects that do not contain many straight lines (architecture for instance), they give very pretty effects; the form lends itself espe-

cially to such subjects as the heads of animals, and in a somewhat less degree to foliage and flowers. However, any subject that would look well in this form would look equally so in some other. In dealing with rectilinear forms, the width of the picture has a great influence on the effect. A narrow horizontal picture is generally termed "panoramic," that is, the angle included is apparently greater than it really is, the effect is to give increased extent in a horizontal direction; if we trim a print in the opposite way and make a narrow upright picture of it, the panoramic appearance disappears and we get a shape suitable for few things but narrow, lofty objects, or those that are very narrow in comparison to their height. Some subjects almost always look awkward in whatever shape they are trimmed; for instance, a view of a long building with a tall tower at one end near to the margin of the print. This is a case where the introduction of suitable clouds would have the most happy effect and occupy the obtrusive blank space, between the tower and the other end of the picture; but, this is nothing to do with our especial chat or trimming prints, which have to be made the best of, however ugly they may be. Most rectilinear shapes look well if the proportion of the height is a fourth less than the length or even rather more narrow than this, if the height is only half the length, the panoramic form is beginning to be suggested. Any measurement more than half and less than a fourth of the length of the base is a pleasant shape and suitable for the majority of landscapes, the subject of course determining which particular form shall be selected.

An excess of plain uninteresting foreground is a common error, and scores of photographs are completely spoiled from lack of courage to use the knife freely. Ovals do not afford us much choice in form, they may be narrow or wide, verging on the circular, the former suggesting the panoramic form when used horizontally. An upright oval is only occasionally useful, as it is apt to give a top-heavy appearance to a landscape on account of the narrowing off of the base; however, some subjects look very nice in suitable ovals, and it affords an opportunity for cutting off a portion of an uninteresting foreground without diminishing its depth, when it is necessary to the general effect of the subject.

I am not partial to dome-shaped pictures, they seem to suggest some part hidden that would be better displayed, or that some defect has been cut off, damaging remainder of the subject. At any rate, a subject that would look well dome-shaped would look better squared up; eccentric shapes, except for special purposes, are better avoided. Our prints having been suitably trimmed are ready for mounting. The kind of mountant is of the first importance, as the longevity of the pictures depends considerably on it. Gum, dextrine, starch, and glue or gelatine, are the substances usually employed, starch perhaps more than any other. A solution of good gum arabic is an excellent mountant, and one that may be safely used, providing it has not become acid; once dry, it seems to resist atmospheric influences as well as any other mountant. Starch has this advantage, it is particularly cleanly; if a little gets on the surface of the mount, it leaves no mark, it is easily made and inexpensive, and adheres well; when dry, it is little liable to change; it should be boiled until it becomes fairly clear, the addition of a little spirits of wine will preserve it for some days; by keeping, a change takes place, it becomes watery, and loses its adhesive properties, and is unfit for mounting. Mr. Cowan's method of starching the prints and allowing them to dry, moistening the mounts on which the starched prints are laid and passed through a press, has much to recommend it, especially for portraits, as the paper does not stretch or distort the portrait; by this plan, no readjustment can take place once the print is pressed down on the damp mount.

Dextrine is not to be recommended, it is frequently acid, and its colour makes it unsuitable for delicate work. Glue or gelatine is excellent, but requires to be heated before application, the small quantity required prevents the mounts cockling; it is, however, much more difficult to work than starch and less cleanly. We now come to the mounts themselves, the samples being of good quality, their selection is chiefly a matter of taste as to their design and colour, the majority of photographs of warm colours are best suited by a creamy tint next the picture, which may vary from half an inch to the full size of the margin. Platinotypes and bromides and all photographs of a cool grey look well with grey and white surroundings or grey and gold. The less ornamental a mount is the better for the picture, a simple line or its equivalent in suitable pale tints is all that is required in the way of decoration. The mount being in only one tint, a line of light colour a short distance from the subject will have a good effect; some prefer the mount severely plain, but the general opinion is that a line is an advantage, and gives an impression of finish and completeness, especially in subjects where a space in the centre of the upper portion of the subject is unfilled, as a space of sky between trees or buildings, but as I have already said much depends on the taste of the worker. Dark margins or of pronounced colour are seldom if ever suitable for prints of any description, maroon and green being particularly offensive on large surfaces, although for portraiture, or when only a very small margin is left, their character is modified, and they take the place of frames and look very well. The usual oak matt has a pleasant effect, especially if the new appearance of the wood is toned down by rubbing with a little linseed oil; as supplied they are rather too obtrusive, but the slight darkening effected by the oil improves the effect wonderfully. One rule will, I think, apply to mounts of all kinds, and that is, they should never be of such character as to challenge attention before the pictures they support, but merely by their tint or form add to the value of the photograph upon them.

EDWARD DUNMORE.

ON THE PREPARATION OF COLLODIO-CHLORIDE PAPER.

[South London Photographic Society.]

THE collodio-chloride process was first introduced by Wharton Simpson in 1864, and, although capable of producing the finest results, it was not much used, many difficulties now removed having to be overcome.

The gelatino-chloride paper coming so much in use has greatly revived the collodion process, which has many great advantages over gelatine.

The formula I use is as follows, and it has been worked out after a long series of most careful experiments, extending over three years :—

A.

Zinc chloride	12 grains.
Tartaric acid	5 ,,
Citric acid	5 ,,

Dissolve in 1½ ounces meth. sulphuric ether.

B.

Silver nitrate 60 grains. Dissolve in 30 minims distilled water by heat; when dissolved, add 100 minims pure glycerine and 4 ounces of meth. alcohol, add to this 60 grains of gun-cotton, well shake, and then add 1½ ounces of ether. When all is dissolved, this should form a greyish-white emulsion of silver in collodion.

The process up to this stage can be manipulated in daylight, but, as we are about to form the sensitive emulsion, we must remove to the dark room. I generally make it at night, when the whole process can be done by gaslight.

We now add the A solution, containing the chloride and acid, gradually, a few drops at a time, to B, well shaking the bottle after each addition. When all is added, well shake for five or ten minutes, so that the emulsion may be thoroughly mixed, as on this, to a very great extent, success depends. The bottle of emulsion is now put aside for about twelve hours to allow all impurities to settle. It can then either be filtered through cotton-wool, or the liquid decanted into another bottle, when it will be ready for coating the paper. This should be a special paper, which is sold for emulsion purposes, known as baryta paper. Now for coating, this is a very simple matter. I use a double frame (shown); in fact, it is like a wooden dish, with the bottom hinged on. You open the frame, put in the paper, and close again, fastening with two clips; this forms a nearly watertight dish. You pour the emulsion on and cover the paper, pouring off at the spout at the bottom corner. Now care must be used in pouring off, the dish must be rocked gently to prevent crapy marks through the emulsion running all in one direction. When set, this takes a few seconds, the paper is taken out of frame and hung up to dry, which it will do in one or two hours, but do not be in too great a hurry, or, if it should not be dry when put in printing frame, it will spoil your negative. When dry, trim round the edges and print till the heavy shadows are slightly bronzed. Collodion papers are much quicker printing than either albumen or gelatine, and more especially in winter time, being so sensitive to the yellow rays.

It can be toned in any bath, either platinum, gold, or a mixture of each. My favourite bath is acetate soda 40 grains, water 8 ounces, gold chloride 2 grains, then add 3 to 4 drops of a saturated solution chloride of lime. This bath improves with age. If it tones too fast add water. Fixing bath, hypo 1 ounce, water to 12 ounces, and let prints remain in ten to fifteen minutes, then wash well for about an hour. It tones much better with platinum than gelatino-chloride prints do, as there is no tendency to discolour the prints as with gelatine.

The first time you tone a collodion print you will quickly notice how evenly it tones, and what an easy job it is compared with gelatine. You never get double tones, and any colour from red to black can be obtained in one bath, simply a question of longer time in the solution to get the darker tones. The tones of collodion prints are also much richer than any other printing paper. You cannot get satisfactory warm tones on gelatino-chloride papers without using a combination bath at a great risk of permanency. You perhaps get a nice tone on one lot of paper; the next lot you cannot get the same tone.

I have tried most of the gelatine P.O.P. in the market, and not one of them comes near a collodion paper for rendering the half-tones and repeating any tone you may desire.

The state of the atmosphere has a very marked effect on gelatine papers, and is the cause of most of the trouble; they so readily absorb moisture in damp weather, and then print and tone quite different to paper printed and finished in dry weather. In toning gelatine papers the half-tones are overdone before the shadows are hardly commenced. You will never get this defect with collodio-chloride, the film is so thin that the toning solution readily and evenly attacks the whole of the surface. The shadows (no matter how heavy) are finished same time as the most delicate half-tones, and there is a much longer scale of gradation in collodion paper than gelatine. The film is also proof against any change of climate; in damp weather it will print and tone just the same as dry.

In the hot summer months we all know that gelatine prints require very careful manipulation; the surface (especially if toned with sulphocyanide) becomes very soft and so soon gets damaged. With collodion prints this is not so, the film never becomes soft; in fact, you can use hot water for washing without affecting the prints. I have used hot water when I wanted to get rid of the hypo very quickly. Also many of you have, no doubt, observed that there is always a grain in gelatine papers. With collodion you get purer whites and a finer surface than even albumen, and considerably more detail than any other printing process. The prints can be burnished with a bar or roller burnisher, but for lubricating alcohol *must* not be used, a little Castile soap dissolved in water instead.

Any other chlorides may be used instead of zinc, but the great advantage of zinc is that it will dissolve in ether or alcohol, whereas most others require water. The less water used in the emulsion the better; it tends (if in too great a quantity) to give crapiness. The glycerine is added to keep the paper from curling, and, if the quantity mentioned is used, it will keep perfectly flat.

The emulsion will keep well (I have some made in February, 1893, which is still in good condition) if kept in a dark place in a well-corked bottle. I use a red bottle, as it can then be handled in daylight without fear.

Some of the prints you see to-night I have coated the paper this week from the emulsion made in February, 1893, which, I think you will agree with me, is a good test for its keeping qualities.

As regards permanency, I have every reason to believe that, if care is taken to thoroughly fix and wash the prints, they will be as permanent as any silver print can be. Captain Abney states, speaking of the Simpsontype, a similar process, that these prints should be permanent, and the process one of rare beauty. One or two prints shown I finished about five years ago; they are printed on ordinary writing-paper, and have been knocking about my dark-room cupboard ever since; they were some early experiments in this direction.

Opal glass, lantern slides, &c., may be coated and printed out. In the case of lantern slides they must be printed very deep; in coating glass a substratum should be used or the silver will crystallise on the surface. I find the following answers very well, and will keep indefinitely:—Egg albumen 2 drachms, add acetic acid 1 drop, water ½ drachm, well stir up, filter after settling for about two hours, add 2 drops of liq. amm. ·880.

The gun-cotton used should be that known as high temperature. Rouch & Co. make it expressly for emulsion processes, and it is very good.

Methylated sulphuric ether, costing from 1*s.* 2*d.* to 1*s.* 6*d.* per lb., and meth. spirit I have always found if purchased from a reliable dealer quite good enough. I would add one word of caution, Do not use the emulsion near a gas flame, the ether very quickly ignites.

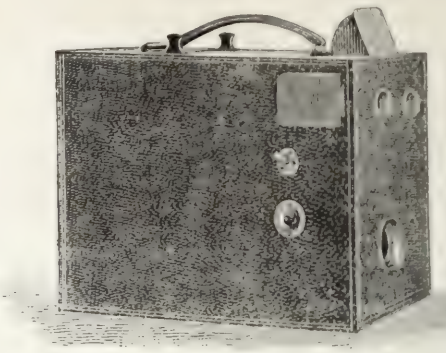
If the emulsion does not flow over the paper evenly after using a few times, the ether has evaporated, and 2 parts ether and 1 part meth. spirit should be added until thin enough; care must be used in coating paper not to let the emulsion stop, but flow over in one even wave, or ridges will be formed which will show in the finished print.

Great thanks are due to the Paget Prize Plate Company, as they were the first firm to put an English-made collodion paper on the market. I have used their paper, and can speak in the highest praise of it. I have some prints here on their latest introduction, viz., a matt-surface collodion paper, which is a great advantage on matt gelatine papers. Very fine black tones rivalling platinotype in appearance can be got by toning with platinum and gold; you will see the great range of colour in the tones of the prints shown, from red to black, and all were obtained in one bath only, viz., acetic soda. A grain and a half of gold was used for seven whole-plate prints.

In conclusion I would urge you to give collodion paper a trial, and I am convinced you would soon discard gelatine. G. H. Moss.

THE "FILMAX" HAND CAMERA.

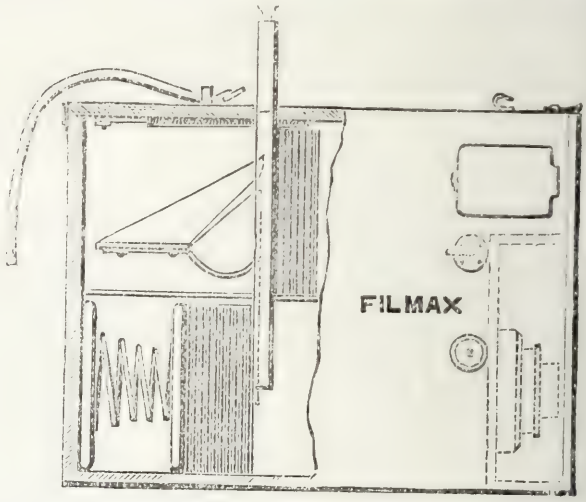
The Filmax Camera Manufacturing Company, of Narrow Wine-street, Bristol, have introduced a hand camera exclusively for carrying cut films, and have given us an opportunity of examining and testing the instrument. This may be described as a strong and well-made camera of the usual



appearance, having its dimensions kept well within the limits of portability. It is neatly covered with black leather.

Two hooded finders, for viewing the image either horizontally or vertically are fitted to the camera, and these, being well sunk, reflect the scene or object with a great degree of brilliancy. The front of the camera lets down, and thus gives access to the lens and shutter. The former is the production of Messrs. Taylor, Taylor, & Hobson, and of the rectilinear type, working at *f*-8, and having an iris diaphragm. The shutter, which is a revolving metal disc controlled by spring movement, is placed at the back of the lens, and has the advantage when fully wound up of giving four consecutive exposures without resetting—$\frac{1}{10}$, $\frac{1}{50}$, $\frac{1}{10}$, $\frac{1}{25}$ of a second. The movement of a small lever on the outside of the camera differentiates between time and instantaneous. All the parts of the camera we have so far described are well and soundly constructed, and such as are calculated to conduce to the production of good photographs.

But it is in respect of its special and peculiar facilities for the storage and



changing of the unexposed and exposed sensitive films that the Filmax is particularly noteworthy. The lower of the two chambers shown in the second illustration is the exposing chamber. This is filled in the following manner:—The door at the back of the camera having been removed, the thirty-six backing cards provided are also taken out, and then, the camera being held right side up, but with the front inclined a little downwards, a cut film is placed in the camera, so that it rests against the side cheeks of the chamber, and is backed up with a card, and so on with the other films and cards until as many are placed in position as may be required. The spring plates and door then close the camera.

To change the exposed film, the handle strap on the top of the camera is loosened and the cross bar shown in the illustration is pulled steadily up as far as it will go and then pushed home again. The exposed film and its backing card are thus, by means of simple internal mechanism, lifted into the upper chamber and another film is ready for exposure in the lower. The movement is easy, certain, and reliable, and defied our repeated efforts to ascertain whether in the course of numerous trials it would play us false. This it entirely failed to do, and we cannot but regard this essential feature of the Filmax camera as one of the most ingenious and satisfactory changing methods we have seen applied to a hand camera. It should be said that the number of exposures made is also automatically recorded.

The Filmax takes thirty-six cut films of quarter-plate size, and must be pronounced a decidedly useful, reliable, and workmanlike hand camera.

ON THE USE OF COLOURED LIGHT IN MICROSCOPY.

[American Monthly Microscopical Journal.]

For several years—indeed, since 1865—I have felt that it is a fact, not sufficiently appreciated by microscopists in general, that the clearness with which an object can be seen depends much more upon the character of the illumination than upon the intensity of the light derived therefrom. Colour is vastly more important than brilliancy. It is a common mistake to suppose that, if an extremely powerful mode of illuminating the object, viewed by means of the microscope, be obtained, an improved definition must necessarily result; but the fact is, on the contrary, that a feeble beam, if it be of the proper colour, will enable more to be seen than if a bright light of an improper tint be used. In 1871 I had a conversation with Mr. Charles Spencer, the celebrated optician, on the subject, when he detailed to me the results he had arrived at during the testing of microscopic lenses, and which were confirmatory, in a very striking manner, of my experiments and the theory I had formed for myself, working independently during the preceding years. I shall not endeavour to detail all the various experiments I undertook, but shall briefly state what led me towards these investigations and the summary of the results I arrived at.

In the year 1865 I was engaged in experimenting on the obtaining of photographic representatives of microscopic objects, more particularly the Bacillariacæ, and this led to my endeavouring to ascertain the best apparatus to be made use of in arriving at the desired results. Of the mechanical part of the problem—namely, respecting the microscope, irrespective of the various lenses employed, as well as the camera made use of—I shall say nothing at the present time, as it does not bear directly on the matter at issue; but, observing that hitherto all microscope objectives had been so corrected that the chemical and visual foci did not correspond in position, and that, if I wished to take photographs with the lenses at my command, I must do as others had done before me—namely, search for the chemical focus of any given combination by taking a series of negatives until I had the point at which the best picture could be obtained—I came to the conclusion that the subject warranted investigation. I thereupon consulted with Mr. William Wales, and put the question to him as to whether he could not make a lens specially corrected for photography—namely, one in which the chemical and visual foci would correspond. In the mean time I turned my attention to the further examination of the matter, and put to myself this question, Supposing such a lens made, would its definition be superior or inferior to those then in use? And, to test this matter, I decided to take such lenses as I had, or could procure, and use only, or almost only, the chemical rays that passed through them, and then ascertain if such a lens would be available for working purposes.

I find in my memorandum-book for October, 1865, the following record: "Having, nearly two years since, made several experiments, from which I deduced certain inferences with reference to the character of the illumination used when resolving fine-line objects, I made some more to-day. My first experiments were these: I have two objectives, one-fifth; one, *a*, defines pretty well, *b* much better, same power and angle. Why is this?

"A. I put on *a* with B ocular, Amphipleura, Cuba, a fixed angle of oblique light. I did not see markings. If I place a blue glass anywhere in the path of the rays, I see lines.

"B. I put on *b* in exactly the same circumstances, and see lines. I place a yellow glass anywhere in the path of the ray. The lines disappear.

"C. I put on *b* with daylight, and I see lines; with light from petroleum oil they disappear.

"D. I get the lines with greater obliquity of ilumination with petroleum light, but with gaslight they disappear.

"These had been my experiments up to date. Now I tried the spectrum from a flint-glass prism in the afternoon, when there are the least actinic rays. Did resolve in the blue ray, and did not anywhere else in the spectrum. The light at the same time was very faint. In the yellow ray the hexagons became strongly marked lines, showing there was more light, but not so much defining power. In the red ray all was confusion. Using spectrum, I could resolve certain objects in the blue ray with a one-fifth. I could only do with a one-fifteenth with the ordinary light. Dr. R. K. Browne, having told me he could resolve the *Amphipleura pellucida* when mounted dry, uncovered on mica, not on glass, I took two drops from the same bottle (Moran Lake, 1865, R. C. G.) of *Navicula rhomboides*, and mounted on glass and mica, uncovered, dry. Using spectrum in the blue ray, I hexagonised with a four-tenth only, to be done in ordinary light with a one-fifteenth. I tried the spectrum from a gum copal prism also; but it was so small and faint from defective polishing, that no different results were arrived at.

"A few days back I was taking a photograph, and used a very faint petroleum oil lamp in my dark room; it was behind the bath, and, preparing the plate, I removed it only twice from the bath, and then introduced it again very quickly, so that it was exposed to the light of the lamp only a very short time; yet there was a picture of the dipper on the plate taken by the light of the lamp.

"October 21, 1865. On my S. and B. Educational Stand I tried their common one-fourth, 75° without correcting collar, mounted *Navicula rhomboides* on quartz, saw transverse lines with dull blue daylight and very moderate oblique light. At night with more oblique light and candle-light saw longitudinal lines, and with gaslight and still more oblique light saw lines."

Continuation of experiments on actinic ray, May 2, 1866. "To-day being dark and rainy, I thought it favourable to try the actinism of the light of a petroleum lamp. With my 1½ in. objective Wales and B ocular, Zentmayer, took three negatives of a transverse section of Nuphar stem as follows:—

"A. 27·5 at 10 a.m., 5 minutes exposure, good.

"B. 57·5 at 10 a.m., 8 minutes exposure, good.

"C. 55 at 10½ a.m., minutes exposure, over-exposed, showing the large amount of actinism in the light of the petroleum lamp. The large silvered reflector was used behind the lamp, the lamp itself up close as possible to the object and the bull's-eye condenser between it and the object, so that there were four thicknesses of glass besides the objective and ocular (1 chimney, 2 bull's-eye, 3 slide, and 4 cover) and balsam between the source of the light and the sensitive plate."

This is all I have in memoranda in my record book; but there are many other experiments which I remember, and they were carried on for several years as I got a chance up to the present time. I now have to record what they have resulted in.

I make a slide of mica coloured blue with aniline blue, and this slide I place in the path of the illuminating beam of light for the microscope. This is a true actinic slide, but a slide can be made of glass also. The colour is put on by means of a varnish of gum, thus or any other colourless varnish. A slide can be also made of mica, but this scratches easily. Besides the actinic slide I have described, a slide coloured with aniline red, green, yellow, or other colour, can be made.

English Mechanic. Arthur M. Edwards, M.D.

MR. H. P. ROBINSON AND THE CONVENTION.

The following letter has been received by the Town Clerk from the new President of the Convention, and we hope (says *The Ludlow Advertiser*) it may prove of interest to our readers:—

Winwood, Tunbridge Wells, July 22, 1895.

Dear Mr. Williams,—My first duty and pleasure on reaching home ought to have been to write to thank you and Mr. Salwey for so efficiently helping me to "lead" the army of photographers I took to Ludlow last Friday in connexion with the Photographic Convention, but you will understand that, when a photographer returns home, he has no sight, hearing, or feeling, except about developing his negatives, which pleasant toil, as far as I am concerned, is now over. I find it difficult to realise that visit—it is more like a dream of years ago. Ludlow is the one spot on the earth that retains its beauty, in spite of all progress, and, although it is forty-five years since I left the town permanently, I have had occasional glimpses, and have seen you grow old without becoming ugly. I have myself outgrown the memory of the oldest inhabitant; the children of my time are the grave and reverend signiors of the present; the names over the doors are nearly all altered, but I am glad to see the town still needs the services of a John Williams and a Salwey, friends of my youth in other generations. You have a new Market Hall, the prodigious size of which argues well for the trade of the town, and I noticed in the distant hills that some of you were actually accomplishing that stupendous feat—removing mountains, doubtless with more powerful implements than were recommended centuries ago. One innovation you have on which I cannot congratulate you. You seem to encourage excursionists and cheap trippers. You will have still more if you treat them as you treated us; for really Mr. Greene's hospitality was phenomenal—there is no other word for it. Besides, the visit gave me the opportunity of again seeing the Mayor of Ludlow in his robes, and I felt as awe-inspired as I did fifty or sixty years ago. Our only difficulty was to find our way up into the Town Hall; this, however, appeared to be more the fault of the architect than the leaders of the day. Nature behaved very well, she wept a little in the morning, but she soon took on such an astonishing degree of beauty that I could scarcely keep the members of the Convention from shouting. My most distant memory cannot bring back another such a day. But when you have got the most beautiful spot on this earth—or any other, a genial following tuned to admiration, and kindly nature does her wonderful best—it is not difficult to have an enjoyable day, and do you know what all this was to me? It is not a figure of speech for me to say that it was the proudest moment in a life not devoid of trivial successes, when I led an army of photographers into my native town. I know they must do it good. They are the best advertisers a beautiful town could have. Your grand reception and the beauties of your town will be freely reported over the known world, especially in America, the place where the finest kind of good tourists are brought up. And for the photographer's own sake I am glad this was a success. You may not know my peculiar relations with photographers, and I scarcely know how to express myself without appearing over-bold. Perhaps a quotation may help me, as one often does. I should like to compare myself to Shakespeare's humble shepherd, who, "from very nothing, and beyond the imagination of his neighbours, grew into an unspeakable estate," for I do hold it is a great estate to live, as I feel I have lived for many years (and been still more assured of it in the Convention week),

in the estimation of photographers both at home and abroad. It is the universal opinion that the Ludlow excursion was a "record." The Convention has had ten years of splendid excursions, but never anything to compare with Ludlow for all qualities that go towards making a pictorial excursion a success.—I am, yours, &c., H. P. Robinson.

John Williams, Esq.

TOURING "TIPS."

[Photographic Scraps.]

At this season of the year the thoughts of many readers of *Scraps* will, doubtless, be directed to the many incidental matters which are connected with the arranging and planning of the annual holiday. To those who have not had much experience in getting together the necessary *impedimenta* for a photographic tramp the following suggestions, which are the result of many years' experience in touring with a camera, may not be without interest.

To deal very briefly with a most important matter, namely, the size of the camera, I can only reiterate the opinion I have, both here and elsewhere frequently expressed, that, if much walking (with the camera as a constant companion) is to be done, nothing larger than a half-plate should be taken. It is, of course, difficult to lay down any hard-and-fast rule, as a weight that would be a burden to some might be carried without discomfort by others. Much depends upon the physical powers of the individual, and also the nature of the locality chosen for the holiday; a kit that would become positively burdensome in a hilly or mountainous district might be carried with comparative ease in a flat country; but, if the reader desires to obtain the maximum amount of enjoyment from a photographic holiday, let him beware how he strains his powers of endurance by carrying too large a camera, or all the benefit that might otherwise have been derived may be lost. From an all-round point of view, where as complete a pictorial record as possible of a district is required, whether with the object of securing a set of lantern slides to illustrate a lecture, or the like, perhaps a quarter-plate camera will be found the most convenient size that can be selected. On the other hand, if the photographer be of a less roving disposition, and content to make some particular spot, from which he can radiate in all directions, his headquarters, no doubt a much larger camera might with advantage be chosen. These, however, are the considerations which the reader must take into account before deciding upon a kit.

The next point to be decided is whether the negatives shall be developed at once or development deferred until after the return. The latter course is, in my opinion, by far the best. Development away from home is usually a more or less unsatisfactory proceeding, and has generally to be carried out under makeshift conditions which in themselves certainly do not tend in the direction of success, nor is there much to be said in favour of the advice which is often given to develop a trial plate from time to time, in order to guard against possible errors in exposure, for, unless the exposures and subjects be identical in duration and character, no useful *data* for comparison can be arrived at. It is, however, very desirable that the plates to be used should be carefully tested before going away; but, this having been done, no necessity for the development of trial plates during the holidays should arise. Another very practical advantage in deferring development until return lies in the fact that very much less apparatus in the way of trays, measures, and chemicals has to be taken, and the bulk and weight of the kit is consequently very considerably reduced. If it were the fact that the technique of the negatives was likely to suffer by deferring development, I should be the last to advocate the system; but, speaking generally, good negatives are more likely to be produced (albeit the exposures may have been made months before) when the photographer is surrounded by the comforts and conveniences of his own dark room than when working in a possibly extemporised dark chamber and under makeshift conditions. In this connexion, however, there is one very important matter, which, I am sorry to say, is often disregarded by the novice—the absolute necessity of making a full and complete record at the time of all necessary *data* connected with the exposure of the plate. This should include (1) the subject, (2) its character, (3) lighting, (4) time of day, (5) lens used, (6) stop, (7) exposure and the information with regard to, 1, 2, and 3 should be as full as possible. Most of the published exposure books do not leave enough space for such details, and I use for the purpose an ordinary memorandum book, which I rule specially.

Another matter which appears to trouble a good many people is the question whether they shall take a sufficient stock of plates to last them during their holiday, or purchase locally, from time to time, as occasion may require. On this point I say most unhesitatingly, Take your plates with you, and get your dealer to order them fresh from the manufacturer and from the same batch. By adopting this plan not only will the negatives be more uniform in character, but the more than possible danger of being supplied with stale plates, or having to put up with a strange brand, will be entirely avoided. It is better, on the whole, to choose a fairly rapid plate, because such can now be obtained possessing all the good attributes which, in the early days of gelatine plates, were usually only to be found in the slower brands. If both rapid and slow plates are taken, and full advantage is to be taken of the fact, the slides must on all occasions contain some of each rapidity, which in itself will cause additional trouble in charging the slides, and repacking exposed plates. For general all-round work a plate of the rapidity of the Ilford Empress should be equal to what is required of it from the exposure point of view in the majority of cases, and, while being less satisfactory for a very trying subject, would, for the average of subjects likely to be attempted, prove more useful than an ultra rapid plate.

In regard to the carriage and packing of plates, both before and after exposure, a great deal might be written; personally, I always carry the unexposed plates in their original boxes, repacking them in the same boxes after exposure. In so doing, however, certain precautions must be observed, or scratchings and pinholes galore will exhibit themselves upon the negatives. Most plate-makers insert little strips of card between the plates, presumably with the object of avoiding abrasion; these it will be found difficult, if not impossible, to replace after exposure. Others, again, insert pieces of tissue paper, or *papier minérale*, between the plates, and these, of course, can be easily replaced. Both plans, however, are objectionable in my opinion, and both, sooner or later, may cause markings on the negative. I never use either, but repack the plates in pairs, film to film, in packets of half-dozens, using the original wrapping papers for the purpose; the only possible danger, if this plan be adopted, is that, if dust or grit is left on the surface of either plate, the aforesaid scratches and markings will make their appearance. This must be guarded against by carefully dusting the surface of each plate as it is packed, and for this purpose I have found nothing better than a mop of clean medicated cotton-wool, though, if desired, the more orthodox camel's-hair brush can be used. Any movement of the plates in transit must, of course, be guarded against, and, if the separating cards or tissues are not used in repacking, the plates will occupy less space in their boxes, and the vacancy so caused must be filled up with additional paper. If a few paper wedges are pushed in between the plates and the sides of of the box, no rubbing or movement can occur through vibration or shaking on the railway. For the purposes of after-identification I always write with a pencil on the right-hand top corner of each plate the number which it bears in my exposure book. This plan is far less troublesome that sticking on an adhesive label on the back of the plate.

A good portable dark-room lamp is an almost indispensable accessory for the peripatetic photographer. One of the triangular folding pattern will be found most useful; it should be of large size, at least a foot in height, or combustion will be imperfect, and, as the whole arrangement packs flat, very little increase in bulk will result from the increased size. The medium is generally ruby fabric, and the best and most economical illuminant an ordinary stout carriage candle, which, being made of specially hard wax, will not run or gutter. It not infrequently happens when on tour that the photographer finds himself in a bedroom immediately outside the window of which a street lamp is situated. To overcome such contingencies, a large sheet of black macintosh, or a full-sized travelling rug, should always accompany the travelling photographer, as either of these, with the aid of a few stout drawing pins, can be pinned up against the window frame to exclude extraneous light.

Never leave anything until just before starting. Get everything that is likely to be required some time beforehand, so that it may be thoroughly tested and its use may become familiar. Neglecting this precaution, the writer on one occasion spoilt a large proportion of a series of negatives through using a shutter which, when set for exposure, admitted sufficient light to effectually fog the plates.

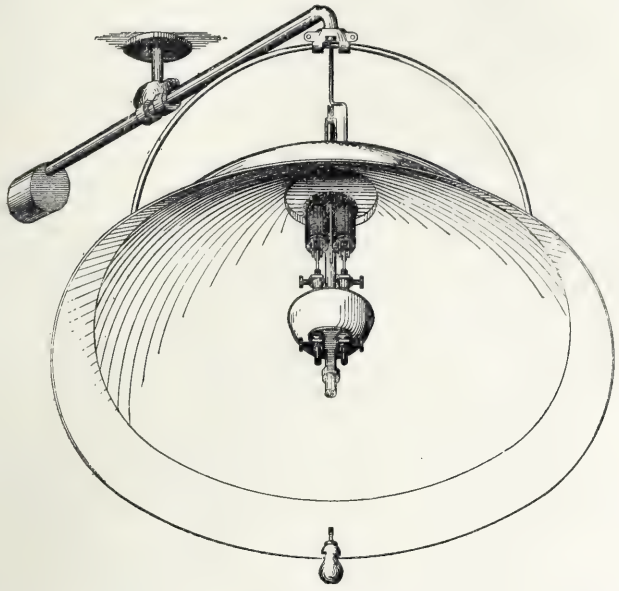
In regard to packing the entire kit for travelling, a *strong wooden* box will be found most convenient, as it will better withstand the shocks and jars of a railway journey than leather or tin. Wicker has been recommended, and, no doubt, has advantages; but it would require to be very strongly made and efficiently lined in some way with waterproof material to prevent the contents being affected by rain or damp. If a good size box is provided, the plates, lenses, &c., can be placed in the middle, and crumpled newspaper freely used to wad the bottom, top, and sides, to prevent, as far as possible, any danger from concussion; and for this purpose nothing is better than spare socks, woollen shirts, and suchlike necessaries, with which all travellers are obliged to supply themselves. Let the box be provided with a good lock, and let it be plainly addressed; there will then be less chance of its going astray, but, should it do so, its contents are not so likely to be tampered with. Such matters as these may appear trifling, but I have at times suffered much anxiety through their neglect.

I have now dealt with most of the more important points connected with the subject, and I will conclude with one or two suggestions upon the carriage of the apparatus in the field. It is, I thiuk, a mistake to follow the usual custom of cramming everything into one case, which very often assumes the dimensions and weight of a well-filled portmanteau; unless the kit is to be carried knapsack fashion on the shoulders, or on the loins, like a soldier's valise, it will be found better to carry the apparatus in two cases rather than one. The heavy leather cases should be avoided, light ones of waterproof canvas are far preferable; of these I have two, one carries the double backs, and the lenses, the other the camera, tripod head, and screw. Each has a handle for carrying, and a broad webbing strap for slinging across the shoulders when a change in the method of carriage is desired. The case containing the backs should be provided with a lock and key, and should always be kept locked. If this be made an invariable rule, much anxiety and annoyance caused by the curiosity of strangers and servants will be avoided. John A. Hodges.

GWYNNE'S NEW DOUBLE CARBON ELECTRIC LAMP,

Messrs. Gwynne & Co., of Brook-street Works, Holborn, E.C., have recently perfected and introduced a modification of their well-known electric lighting apparatus for portraiture which will doubtless be popular among photographers during the forthcoming winter season.

The lamp in its new form should, above all, commend itself to photographers on the score of economy, inasmuch as it will enable them to reduce their bill for current by one-half, while in no way diminishing the quality or power of the light. This desirable result is effected by fitting the lamp with a double set of carbons instead of the one set as hitherto.



These double carbons take a current of twenty-five ampères, instead of fifty with the one, the light being practically the same as with the larger quantity of current named. Messrs. Gwynne inform us that photographers occasionally find a difficulty in getting a current of fifty ampères from the Companies' supply, whereas there is no difficulty about the smaller quantity. The double carbon lamp gives a light of remarkable actinic value and works with perfect steadiness and noiselessness, and, as it entails no extra trouble in manipulation, we have every confidence that it will be welcomed as a happy thought in electric lighting for photographic portraiture.

THE PREPARATION OF PLAIN SALTED SILVER PAPER.

[South London Photographic Society.]

There is a great charm in matt-surface prints that most amateurs admire.

I was led to experiment, in preparing a matt-surface paper in the early part of last year, through not being satisfied with the gelatine papers on the market, the tones not being so rich and warm as I desired; so I set to work to sensitise drawing-papers, &c., so that the image would be right on the surface and yet use no gelatine for sizing, as, to my mind, gelatine is not at all a good vehicle for holding silver salts, as it so readily combines with the silver, and forms unstable compounds causing the prints to very easily fade.

The use of gelatine in the salting of the paper is to get vigour as well as keep the image on the surface. My first difficulty was to get vigour in the prints, and after a series of experiments I adopted the following formula:—

Sodium chloride *in crystals*, not table salt	150 grains.
Ammonium chloride.....	100 ,,
Pot. bichromate.....	4 ,,
Water, to	20 ounces.

Get some Whatman's drawing-paper, either the rough or smooth surface, or, if a smoother surface is desired, the Rives paper. Soak in the above for three to five minutes, and hang up to dry. When dry, sensitise on the following bath:—

Silver nitrate	400 grains.
Citric acid	150 ,,
Water	10 ounces.

Float the paper for about two minutes, the surface will then be a light primrose, and, if any air bubbles are on the paper through careless floating, white patches will show where the paper is not sensitised. When dry, print a little deeper than desired; when finished, tone in any bath about half the strength used for P.O.P., well rinse in several changes of water and fix in hypo 1 ounce, water to 10 ounces, ten minutes for Rives paper, and twenty minutes for Whatman's very rough and heavy paper. Well wash about two hours.

The paper very readily tones to any colour from sepia to warm black, it can be made to suit any negatives, hard or soft; the formula given will be suitable for a negative such as would give a good print on P.O.P. Bichromate of potash gives vigour to the image, and for very hard negatives use less, and if very thin use more, which gives great command over the results, and you will see from the prints shown that, although no gelatine is used for sizing and keeping sensitive salts on surface, the detail is quite as good as the ordinary gelatino-chloride matt-surface papers. You can sensitise any surface paper you may desire to use. The yellow appearance of paper disappears as soon as put in the washing water. The paper when sensitised keeps very well. I have some prepared last August, and printed this month, that is all right. You can salt a lot of paper and put by, it improves by keeping.

The paper gives a good tone for woodland scenes if fixed only without toning, but washing well, say ten minutes before putting in fixing bath, or sulphur toning will take place, and the high lights will appear yellow.

The whites will be quite pure if the print is washed before fixing.

G. H. Moss.

THE THREE-COLOUR PROCESS.

The following interesting article on the above subject appears in *Process Work*, an excellently conducted monthly publication:—

Whilst the practice of three-colour photochromy has made considerable progress in the past year or so, we do not seem to have arrived at any very definite decision as to whether three colours are going to render all the hues of nature, or whether four or five or more will be constituted in the process of the future. It is really a conflict between scientific and practical testimony. Vogel, Husnik, Ives, and others who have gone deeply into the science of the subject, tell us that with three ray filters, producing three negatives, which afterwards render printing plates impressing red, yellow, and blue ink on white paper, we ought to be able to secure all the colours of nature, and it is only because of the imperfection of the materials to hand that we cannot at once achieve the result desired. From the practical point of view it is pointed out that by the three-colour process results are accidental, and as uncertain as a lottery, where one prize is drawn from one thousand blanks. It is, of course, possible, by a good deal of retouching, to modify the errors of the negatives, and those firms who make a speciality of colour work, no doubt, owe their most successful results to the skill with which they balance inequalities of colour-rendering. But this is not true photochromy, and, so long as a great amount of hand work is required, there must always be the risk of error and unnatural effect. We firmly believe that, if three-colour heliochromy is to become a popular process, it must be by virtue of the fact that it is a mechanical and automatic method of rendering natural colours. The public will tolerate its imperfections if they are frankly told that "this is a photograph," but the moment they see the evidence of hand work the suspicion will arise that it is not real, and it will have no value as a faithful record, and will not be accepted as such. The case is quite analogous to the popularity which the half-tone process has attained in spite of its artistic defects. The gauze effect might be a little irritating, but, said the public, "it's like a photograph," and that covered a multitude of faults. Depend upon it, the public are not to be deceived. In general, they know a painting from a coloured lithograph, and a colour engraving from a photochrome block, and they will not be put off with one for the other. Our opinion is that, if photochrome—that is purely three-colour—prints are wanted, it is better to give them with their imperfections, but, of course, as well as they can be made. If chromo-lithographers want to avail themselves of photography to ease their work and improve their results, by all means let them do it in as many colours as they like, but don't call it heliochromy or photochromy, or by any other photographic designation.

The elementary principle of three-colour printing was recently stated very succinctly in an article by Dr. A. Muller Jacobs, and we cannot do better than quote from it the following:—

"Three pigments—yellow, red and blue—when intimately mixed in certain qualitative and quantitative proportions will produce a neutral black—that is, a black without reddish, bluish, or any other colour shade. Such ideal black, diluted and mixed with a white colour stuff, white lead for example, in certain quantity, will naturally give a neutral grey, without any colour tone prevailing. The same will result when the elementary colours, yellow, red, and blue, are printed on paper, one upon the other. If the surface the three colours are to be printed upon is undivided, black is produced, but, if the paper is divided by lines or stipple, an optical delusion takes place, and by means of portions of the pictures not having come in contact with the pigments, on the white of the sheet, the black is changed into grey, provided, however, the printing surfaces of all the three plates are perfectly equivalent to each other. The printing surface of the three plates disturbed in the least in their equilibrium, that is, if the printing of one or two plates exceeds that of the third, the print is neither black nor grey, but shows distinct colour tones, in which any of

the spectral colours, red, orange, yellow, green, blue or violet, may predominate. In this manner all possible colour tones may be produced. The principle of three-colour printing depends much upon this fact, and, if every part of the process be carried out properly, we would be enabled to reproduce natural colours with perfect truth and exactness."

But, as the same writer points out, it is practically impossible to work the process with such correctness, and the slightest error at any one stage of the process will disrupt the harmony of the whole. In the half-tone process the writer thinks there is likely to be the greatest risk of error, because of the many operations necessary. We shall, in fact, be much nearer the perfect result when we can take the negatives with which the blocks are made direct from the object, instead of having to make first the three original negatives, then three positives, and from these three negatives through the half-tone screen. We also require an infallible test of the quality of the negative, so that it may be known when the correct value has been attained. The only test at present at command is the finished proof.

In regard to the practical objections to the three-colour process, we may quote from a letter we have recently received from Mr. Walter Hay, whose excellent three-colour chart appeared in our *Year-Book*. He says: "I am sure that colour work with three printings is almost impossible. Take, as a simple example, body colour blue. I mean a blue obtained by mixing one part blue and three parts white. No possible tone of the primary blue can give this. In fact, it is the body colour obtained by mixing white and the primaries that give the trouble. Try to get a body blue and reproduce it; I cannot see how it is possible to do so except by another printing in which body blue is used. The three colours may come very lovely, but look at the difficulty of register. All the dark touches must be solid in the three printings, I mean the dark browns, &c. Also it is impossible to get the light warm greys with a fine line screen, and impossible to get detail with a coarse one. Your primary red is almost as dense as black, and how can you get a light warm grey, when about equal strengths of red and blue and grey are mixed? No proper colour printing can ever be done with entirely straight line screens. Now and then a subject lends itself to them, but for practical purposes only one colour should be straight lined, viz., yellow. I should say that five colours are necessary, as follows:—1, Yellow, cross lined; 2, blue, a fine stipple; 3, red, slightly bolder stipple; 4, grey, fine stipple; 5, dark brown or black, also a stipple. In fact, I believe that, if ever colour work on zinc, copper, wood, stone, or any other surface is to be successful commercially, it must be in stipple, not line. As you know, when red crosses blue in line there are four colours formed—1, where the red crosses, purple; 2, a bare patch of red; 3, a bare batch of blue; 4, the tone between the lines causing the white to be light purple. With a stipple innumerable combinations take place, as the dots are irregular. Above all, the grating effect of crossed lines is fiendish in colour work if bold, and heavy if fine."

We put forward these considerations and opinions as representative, and we think they are likely to prove useful to those of our readers who are working or experimenting in the colour process. It will save much wasteful experiment if the moral is grasped.

ON THE DECOMPOSITION OF THIOSULPHURIC ACID.

[Translated from the French by G. E. Brown, A.I.C.]

It is a well-known fact, that on mixing dilute solutions of a thiosulphate and an acid, sulphur is not precipitated at once, but only after a certain time, the duration of which depends upon the degree of concentration of the solution. It is generally assumed that thiosulphuric acid is liberated and remains entirely unaltered until the moment when precipitation of sulphur takes place, after which time the free acid commences to slowly decompose. Such an opinion has been expressed by M. Landolt in several passages in his memoir *On the Duration of the Existence of Thiosulphuric Acid in aqueous solution*. But, if this was really the case, the above would constitute a very remarkable phenomenon from the physico-chemical point of view. In fact, if the decomposition of the thiosulphuric acid is represented by the equation—

$$H_2S_2O_3 = H_2O + SO_2 + S,$$

then it follows, from physico-chemical considerations, that the decomposition in question should take place from the first instant after the acid has been liberated, and that the speed after reaction should be greatest at the beginning, according to the well-known equation of unimolecular decomposition—

$$-\frac{dC}{dt} = K \cdot C,$$

where C is the concentration of the acid at each moment, t the time, and K a constant.

Twenty years ago Spring endeavoured to explain the observed phenomenon by assuming that, when an acid acts on a solution of a thiosulphate, an acid thiosulphate is first formed, and that this compound subsequently splits up into a trithionate and hydrogen sulphide.

$$\begin{matrix} KSO_3 - S\,H \\ KSO_3 - S\,H \end{matrix}$$

"It is known," M. Spring* states (*loc. cit.*), "that hydrogen sulphide decomposes the trithionates, giving rise to thiosulphates, consequently trithionates can only be produced in the preceding reaction in proportion to the amount of hydrogen sulphide which is liberated and escapes from the liquid. If the liquid remains clear for the first moments, and no separation of sulphur is seen to take place, the thiosulphate is being converted into trithionate with formation of hydrogen sulphide, of which a portion escapes from the solution. The hydrogen sulphide, however, which accumulates in the liquid prevents the formation of the trithionate, for it would be produced under circumstances favourable to its destruction, and starting from this moment the thiosulphuric acid commences to decompose with formation of sulphur dioxide. This last reacts on the hydrogen sulphide, and sulphur is deposited; the hydrogen sulphide is thus destroyed and the formation of the trithionate is able to begin again; and thus the changes take place in a cycle."

This hypothesis thus postulates the primary formation of hydrogen sulphide, a portion of which is liberated in the free state. The hypothesis is not otherwise admissible. I have shown by the following experiments that not a trace of hydrogen sulphide is formed during the action of acids on an alkaline thiosulphate—at least, in the concentration employed.† The experiments were made with sodium thiosulphate, purified by crystallisation. ·2943 grammes of $Na_2S_2O_3 \cdot 5H_2O$ required 11·83 c.c. of decinormal iodine solutions calculated, 11·86 c. c. ·248 gramme (one molecule in milligrammes) was dissolved in ten c. c. of water and an equivalent quantity of sulphuric acid (viz., five c. c. of a one-fifth normal solution) added rapidly to it. A current of air was then drawn through the solution, passing afterwards into a solution of lead acetate. There was not the least formation of lead sulphide. This experiment was repeated, using fourteen grammes of potassium thiosulphate dissolved in 300 c. c. of water, and adding to it three grammes of sulphuric acid diluted to twenty-five pounds, and also using other proportions of acid and thiosulphate, without obtaining any lead sulphide. The experiment may be made still more convincing in the following way: One or two drops of a solution of lead acetate are added to a solution of a thiosulphate. A precipitate of lead thiosulphate is first formed, but dissolves in excess of alkaline thiosulphate. On adding a trace of hydrogen sulphide to this liquid, a black colouration of lead sulphide instantly makes its appearance. On acidifying another portion of the solution, an opalescence of sulphur appeared after several minutes, but the liquid remains perfectly colourless, proving that it contained no hydrogen sulphide.

The hypothesis of Mr. Spring is thus disproved, and the experiments of Colefax have also shown that, in a dilute solution (less than one-tenth normal), the formation of polythrionic acids only takes place in small quantities, and that thiosulphuric acid decomposes during the first day only according to the equation—

$$H_2S_2O_3 = H_2O + SO_2 + S,$$

whilst only a portion of the acid exists in the liquid if the operation is performed in closed flasks, owing to the fact that the sulphur dioxide cannot escape.

Colefax has obtained these results by two series of titrations. It follows from the equations,

$$2H_2S_2O_3 + 2I = H_2S_4O_6 + 2HI$$
$$H_2SO_3 + 2I + H_2O = H_2SO_4 + 2HI,$$

that the titre of the liquid against a solution of iodine should increase when a part of the thiosulphuric acid has decomposed, whilst the titre of the liquid against an alkaline solution after the reaction with iodine should increase in the same proportion if the decomposition into sulphur and sulphur dioxide be the only reaction taking place. Colefax has found this relation to hold good, and from that fact he has drawn the conclusion above mentioned. He has not directly proved the existence of thiosulphuric acid, but has deduced it from the fact that the final titre of the liquid is only about one and a half times the initial titre, whereas it ought to have been double if the thiosulphuric acid had been totally decomposed. The direct proof of the presence of this acid in a solution of sodium thiosulphate, acidified with an equivalent quantity of hydrochloric acid, and kept for about twenty-four hours at 24° C. in a closed vessel, can be given thus:—The solution was separated from sulphur by filtration, a portion of the sulphur dioxide expelled by a current of air, and the liquid neutralised before it had subsided. On adding alcohol and a little ether, a salt was precipitated which, when redissolved in water, gave, on addition of an acid, a precipitate of sulphur. The solution of the thiosulphate was one-fifth normal, and that of the hydrochloric acid two-fifths normal.

It may be further proved by another method that the formation of

* *Bulletin de l'Académie Royale de Belgique* (July, 1876).

† It well known that thiosulphates yield hydrogen sulphide with strong sulphuric acid.

polythionic acids is very small during the commencement of the reaction. According to the equation

$$H_2S_2O_3 = H_2SO_3 + S,$$

the acid titre of the liquid does not change if this is the only reaction which takes place. On the contrary, if trithionic acid is formed, the acid titre of the liquid should rapidly diminish, since

$$2H_2S_2O_3 + 3H_2SO_3 = 2H_2S_3O_6 + 3H_2O.*$$

Trithionic acid is the only polythionic acid which can be formed directly, in fact, it is well known that trithionates are prepared by treatment of thiosulphates with sulphur dioxide. But I have stated that on mixing equal volumes (5 c. c.) of one-fifth normal solution of sodium thiosulphate and two-fifths normal hydrochloric acid, the acid titre diminishes only very slowly. Temperature 24° c. c.; initial titre 10·0 c. c. one-fifth normal sodium hydroxide.

Time elapsed.	Titre.
2 mins. †	10·0 c. c.
8 ,,	9·9 ,,
20 ,,	9·7 ,,
120 ,,	9·0 ,,
24 hours	8·3 ,,

It is thus seen that in this degree of concentration there is a certain quantity of polythionic acid formed, although the reaction takes place very slowly. It must also be observed that the flask having been closed only by a cork, of excellent quality, it is true, the loss of titre is perhaps a little too low.

It may now be regarded as proved that the decomposition of thiosulphuric acid is represented, at the commencement of the reaction, very nearly by the following equation :—

$$H_2S_2O_3 = H_2O + SO_2 + S.$$

It is, however, a strict deduction from chemical dynamics that this decomposition should commence as soon as the acid is liberated, and that it should be at a maximum at the first, and should gradually decrease. As a matter of fact, this deduction may be experimentally proved to be correct.

When a solution of thiosulphuric acid, in a state of slow decomposition, is neutralised, its decomposition should be instantly arrested; for the solution then contains a sulphite and a thiosulphate—substances which have no action on each other. I made a mixture of 5 c. c. one-fifth normal solium thiosulphate and 5 c. c. normal sulphuric acid. At ordinary temperature this mixture became heated after thirty seconds; five seconds after mixing, I added 2 c. c. of a normal solution of sodium hydrate. The reaction of the liquid was neutral, yet a few seconds later a light opalescence appeared. The same phenomenon was observed on adding 2·1 c. c. normal solution of the alkali. In the latter case the liquid was strongly alkaline.

The opalescence is naturally more pronounced if the reaction be terminated at the expiration of ten seconds. Still, under ordinary circumstances, the opalescence does not appear until twenty seconds later. When excess of alkali is present, it disappears after some minutes.

The appearance of sulphur after five seconds can be better seen by introducing into the mixture five c. c. of two-fifth normal solution of sodium carbonate. I first convinced myself that carbon dioxide only renders a one-fifth normal solution of sodium thiosulphate turbid after ten minutes, and that sodium bicarbonate does not cause any opalescence.

It follows from this experiment that the researches of Landolt, cited at the commencement of this article, must be interpreted in a different way. He has not really measured the duration of the existence of thiosulphuric acid in the free state, but the time which must elapse before the molecules (or atoms) of sulphur have united into masses sufficiently large to be visible. As to the second deduction from the equation given above, it can be confirmed by titration with iodine solution. An excess of iodine solution was introduced into the mixture of thiosulphate and acid, and the excess titrated back with standard thiosulphate solution. The initial litre immediately after mixing was ten c. c.

Temperature 17° C.			Temperature 24° C.			Temperature 31·5° C.		
Time.	C.c. Iodine Sol.	Diff.	Time.	C.c. Iodine Sol.	Diff.	Time.	C.c. Iodine Sol.	Diff.
1	10·4	·4	2	11·6	1·6	5	12·7	2·7
5	11·4	1·0	4	12·5	·9	10	13·55	·85
10	12·0	·6	6	13·05	·55	15	14·0	·45
20	12·5	·5	8	13·55	·5	30	14·1	·1
30	12·9	·4	10	13·7	·15	—	—	—

It is thus seen that, as required by theory, there is a fairly rapid diminution in the speed of the reaction.

The question may now be asked, Why does thiosulphuric acid decompose whilst its salts are stable in aqueous solution? It will be seen from data given below that the greater proportion of the molecules are dissociated in the solution of the salt as well as in that of the free acid. It seems natural, therefore, to seek the cause of the phenomenon in question in the action of the H cations on the S_2O_3 anions, an opinion which is advanced by Ostwald. It may, however, be supposed with equal reason that the decomposition is due to the non-dissociated molecules, $H_2S_2O_3$, breaking up into H_2O and S_2O_2, this last group being unstable and splitting up into SO_2 and S. When a portion of the molecules, $H_2S_2O_3$, have thus disappeared, the equilibrium between them and their ions is destroyed, and the whole molecules, $H_2S_2O_3$, must be formed anew; but, in proportion as the concentration of the ions, $H_2S_2O_3$, decreases, the quantity of molecules, $H_2S_2O_3$, standing in equilibrium to the ions would become smaller and smaller, and, when at last the concentration had become so small that no appreciable quantity of whole molecules existed, the decomposition would be extremely slow, as proved by experiment. The researches of Foussereau (*Comptes Rendus*, 104, p. 1842), as well as those of Colefax, may be cited here. Foussereau states that the electrical resistance of an acid solution of thiosulphate of soda at first increased rapidly, becoming constant after several days.

By the method given below I have attempted to show which of these two points of view is the most probably true. If the molecules $H_2S_2O_3$ are decomposed, any cause which diminishes dissociation should increase the quantity of acid decomposed in the unit of time, the concentration of the molecules being increased. If, on the other hand, it is the ions which suffer decomposition, the same course should diminish the above-mentioned quantity, the concentration of the ions being reduced. If we thus calculate K from the equation

$$-\frac{a\,C}{a\,t} = K - C \qquad (1)$$

for these concentrations of acid, $C_1 > C_2 > C_3$, we ought to find that $K_1 > K_2 > K_3$, the concentration of the molecules, $H_2S_2O_3$, increasing more quickly than that of the whole acid; in the other case we should have $K_1 < K_2 < K_3$.

I have thus determined the quantity decomposed during the first minute for concentrations, normal, half normal, and one-fifth normal sodium thiosulphate on mixing these solutions with an equal volume of acid. By so doing the concentration of thiosulphuric acid is reduced to half that of its sodium salt. The weights decomposed were ascertained by adding excess of one-tenth normal iodine solution and titrating the residual iodine with thiosulphate solution. As has been already shown, the increase in the iodine consumed gives directly the quantity of acid decomposed.

In making the calculations we obtained, by integration of equation (1),

$$-1\cdot C = K\cdot t + \text{constant},$$

whence for K during first minute we have

$$1\cdot C - 1\cdot C^1 = K,$$

where C be the initial and C^1 the final (after the minute) concentration of the thiosulphuric acid.

(*a*) Two c. c. normal thiosulphate and two c. c. normal hydrochloric acid mixed with excess of one-tenth normal iodine; 19·6 c. c. one-tenth N iodine required immediately after mixing. Hence initial concentration, $C_1 = 0{\cdot}490$.

One min. after mixing liquid required 26·5 c. c. one-tenth N iodine. Hence final concentration, $C_1^1 = 0{\cdot}316$. Hence

$$K_1 = 0{\cdot}437.$$

(*b*) Four c. c. half normal thiosulphate and four c. c. normal hydrochloric acid; initial concentration, $C_2 = {\cdot}245$. One minim. after mixing liquids required 24·1 c.c. one-tenth N iodine; hence final concentration $C_2 = 0{\cdot}189$. Hence

$$K_2 = 0{\cdot}258.$$

(*c*) Five c.c. one-fifth normal thiosulphate and five c. c. two-fifths normal hydrochloric acid required, immediately after mixing, 9·85 c.c. one-tenth N iodine. Hence initial concentration $C_3 = {\cdot}0985$. One mimin after mixing the liquids required 10·5 c. c. one-tenth N iodine. Hence final concentration, $C'_3 = {\cdot}0920$, whence

$$K_3 = {\cdot}068.$$

It is thus evident that K increases with the concentration, but that this increase is much less rapid than would be expected were the only cause of it the diminution of ionisation, the latter not varying so much in the concentrations employed here for thiosulphuric acid as for strong acids in general. The speed of the decomposition of thiosulphuric acid appears, therefore, to be caused by some disturbing agency which subsequent experiments have yet to elucidate.

Determination of the Molecular Conductivity of Sodium Thiosulphate.—These measurements have been made by Ostwald's method (*Zeitschrift für Physik und Chemie*, ii. p. 56).

V	μ
32	101·1
64	107·6
128	113·0
256	117·4
512	120·0
1024	120·2

* Colefax has shown that polythionic acids only form after several days by the action of sulphur dioxide on sulphur.

† In order to mix the two liquids in proper proportions, I have employed Landolt's device of introducing the 5 c. c. of acid into a capsule covered on the inside with a layer of paraffin, to which none of the aqueous solution adheres.

Temperature 24·9°–25° C, V, as usual the number of litres containing an equivalent ($\frac{1}{2}Na_2S_2O_3 5H_2O$), and μ the molecular conductivity.

By employing the little table of M. Bredig (*Zeitschrift für Physik und Chemie*, xiii. p. 198), the following values for $\mu\infty$ symbol for infinity are obtained:—

Calculated for	μ 32	126	Hence mean value: $\mu\infty = 128$.
,,	μ 64	128	
,,	μ 128	129	
,,	μ 256	129	
,,	μ 512	128	
,,	μ 1024	129	

The molecule of sodium thiosulphate is therefore already very considerably dissociated at V = 32, like all soda salts.

By subtracting from $\mu\infty$ the constant A (*in loc. cit.*) for Na, we obtain for the speed equivalent of the ion $\frac{1}{2}Na_2S_2O_3$ the value

$$A' = 78{\cdot}8,$$

whilst M. Bredig (*loc. cit.*) mentions under reserve the value $a' = 91$, deduced from measurements on magnesium thiosulphate. He, however, is aware of the anomalies which magnesium salts often exhibit in regard to their conductivity.

Determination of the molecular conductivity of thiosulphuric acid. In order to determine this, I have first made measurements on a one-thirty-second normal solution of sodium chloride, and then on a mixture containing one-thirty-second normal sodium chloride, and one-thirty-second thiosulphuric acid, as it is obtained by mixing equal volumes of one-sixteenth normal solutions of hydrochloric acid and sodium thiosulphate. For comparison, I have determined the conductivity, on the one hand, of acetic acid and sodium chloride, and, on the other, of a mixture of sodium chloride and sulphuric acid. The results are as follows:—

Temperature, 25°C. NaCl; v = 32; $\mu_{32} = 104{\cdot}0$

$NaCl + C_2H_4O_2$; v = 32 (for each combination); $\mu_{32} = 113{\cdot}4$. Hence for acetic acid $\mu_{32} = 9{\cdot}5$.

$NaCl + \frac{1}{2}H_2SO_4$; v = 32 (for each combination); $\mu_{32} = 355{\cdot}8$. Hence for sulphuric acid, $\mu_{32} = 251{\cdot}8$. $\frac{1}{2}Na_2S_2O^0 + HCl$; v = 32 (for each combination; $\mu_{32} = 378{\cdot}6$. Hence for thiosulphuric acid, $\mu_{32} = 274{\cdot}6$. These figures seem to justify the conclusion that the molecular conductivity of thiosulphuric acid is of the same order as that of sulphuric acid, and much higher than that of acetic acid.

A. F. Holleman.

Our Editorial Table.

Messrs. Archer & Sons, of 43–49, Lord-street, Liverpool, have sent us their special list of new hand cameras, in which a great variety of these popular instruments are illustrated and described.

Mr. Lendon Berry, Aberdare, has sent us a selection from a collection of stereoscopic pictures he took on the occasion of some of the excursions made during the recent Convention at Shrewsbury. They comprise both general scenery and knots of excursionists, and are very attractive, more especially from their being stereoscopic.

News and Notes.

The Cheltenham Amateur Photographic Society will hold an Exhibition of Photographic Work, under distinguished patronage, in the Corn Exchange, Cheltenham, on Tuesday, Wednesday, Thursday, and Friday, October 29 to November 1, 1895. The Judges are Mr. Andrew Pringle, Colonel J. Gale, and Mr. B. Gay-Wilkinson. Occasional limelight demonstrations will take place each afternoon and evening. The Secretary is Mr. Philip Thomas, College Pharmacy, Cheltenham, of whom particulars as to open classes may be obtained.

W. H. Clark.—A high testimonial to his honesty and business integrity is given to Mr. W. H. H. Clark, recently and for a number of years editor of *The St. Louis Practical Photographer*, by the leading manufacturers, dealers, and photographic artists of St. Louis, headed by Mr. Gustave Cramer and followed by twenty-eight other men of mark, from which we infer that Mr. Clark is discontinuing literature in favour of commerce. His friends say, "We believe him to be a man of his word, honest and upright in all things, never having known him to commit an act of injustice to any one, and, from our many years of business relations with him, we find him a thoroughly efficient and honourable business man."

The Gem Dry Plate Company's Annual Dinner.—The first Annual Holiday and Dinner of the *employés* of the Gem Dry Plate Company, Limited, was held on Saturday last. An excellent dinner was served at the White Lion Hotel, Brighton, the chair being taken by the Managing Director, Mr. R. G. Modera, and the vice-chair by Mr. T. E. H. Bullen. In replying to the toast, "Success to the Gem Dry Plate Company and the Health of the Directors, Messrs. Modera and Bullen," the Chairman stated that he had very great pleasure in being present, especially as the progress of the Company had been so encouraging. He felt sure that it would be gratifying to the *employés* to know that the Directors, Mr. Bullen, and himself had such confidence in the future of the Company, in the hearty support and goodwill of all in their employ, that they had decided to considerably increase the capital of the Company, and, further, that the whole of the new shares had been immediately taken up. To meet the increasing business of the Company, new and improved machinery had been ordered, which would enable the Company to undertake an unlimited quantity of work in the manufacture of all classes of photographic plates, papers, and films.

Photographing Plymouth Forts.—On Thursday evening a singular affair took place at Fort Bovisand, near Plymouth. A party of gentlemen were observed in the vicinity of the fort, and, on closer examination by some of the artillerymen stationed there, it was found that one of the group was in the act of taking a photograph of the place by means of a hand camera. The matter was reported to the commanding officer, and orders were at once given for the visitors to be brought into the fort for the purpose of hearing what explanation they had to offer for violating one of the Queen's regulations. The order was promptly executed, and, the persons having been conducted to the fort, the officer deemed it advisable to detain them pending the arrival of a police constable of the Devon County Constabulary. Meanwhile the names and addresses of the party were willingly given, and from these it appeared that it consisted of a French master at one of the local schools, three Frenchmen who are studying English in the neighbourhood, and three Englishmen. The constable, not knowing how to act under the exceptional circumstances, followed the instructions of the officer in charge of the fort, and conveyed the gentlemen, accompanied by a military escort, to Stonehouse. Their arrival at the station was awaited by a superintendent, to whom they fully explained the whole of the circumstances. Their names and addresses having been as freely given as the story of their strange adventure, they were allowed to leave at ten o'clock without the escort which had accompanied them from the fort. It is understood that the camera was being used by one of the Englishmen when the look-out men at the fort discovered what was going on. Doubtless the matter would not have been carried so far but for the presence of foreigners. The commanding officer at the fort will forward a report to General Sir Richard Harrison, commanding the Western District, and no further action in the matter will be taken by the police until the decision of the military authorities is made known. It is stated that the Englishmen and Frenchmen met each other near the fortifications and entered into conversation.—*Daily Telegraph.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
12	North Middlesex	
12	Richmond	
13	Birmingham Photo. Society ...	Exhibition of Competitive Pictures.
13	Hackney	
13	Manchester Amateur	
13	Paisley	
13	Rochester	
13	Royal Photographic Society ...	
13	Stockton	
14	Leytonstone	
14	Munster	
14	Photographic Club	
14	Southport	*Hand Cameras* versus *Stand Cameras*.
14	Stockport	
15	Glossop Dale	
15	Hull	
15	London and Provincial	
15	Oldham	
15	Oxford Camera Club	
16	Cardiff	
16	Croydon Microscopical	
16	Holborn	
16	Leamington	
16	Maidstone	
16	North Kent	
17	Hull	
17	Leytonstone	Excursion: Broxbourne.
17	North Middlesex	Exc.: High Beech and Lippitt's Hill.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

August 1,—Mr. W. E. Debenham in the chair.

Mr. J. Copland was elected a member.

The Chairman handed round a platinum print that had been sent him, and which was bronzed in the shadows, and invited members to give their opinions as to the cause of the defect and the remedy for it.

Mr. A. L. Henderson was inclined to think that the negative was too thin, or that the paper contained too much metal.

Mr. J. S. Teape thought that possibly it was a case of over-printing.

The CHAIRMAN had over-printed on platinum paper, but had not got bronzing. Bronzing, he thought, did not at all imply the presence of too much metal.

Mr. P. EVERITT suggested the presence of silver or some other metal.

Mr. J. E. HODD mentioned that he had got bronzing in cases where he had certainly not over-printed.

"PRESTO" PAPER.

Mr. W. T. WILKINSON handed round prints on Scholzig's Presto paper, the chief feature of which is that it allows of a comparatively short exposure to day or gaslight, the scarcely visible image being then developed, and toned and fixed in the usual way. The following are the essential instructions for working the paper, which Mr. Wilkinson quoted in the course of his short address :—

Like bromide papers, the film of the Presto paper is yellow, and changes to pure white in the fixing bath.

PRINTING.

Expose under the negative in weak daylight or artificial light until a very faint trace of the image is visible. In daylight this will take less than half a minute ; in very dull and artificial light proportionately longer.

Very weak or flat negatives without strong contrasts should only be exposed until the very faintest trace of the shadows appear, whilst hard negatives with exceptionally strong contrasts require a little more exposure to ensure the light penetrating the densest parts ; with such negatives the outlines of the image should be plainly discernible.

DEVELOPING.

Stock Solution.

Eikonogen	60 grains.
Soda sulphite (pure)	240 ,,
Potassium (carbonate pure)	120 ,,
Ten per cent. solution of potassium bromide	30 minims.
Distilled water	5 ounces.

For use mix—

Stock solution	4 drachms.
Water	10 ounces.
Ten per cent. bromide of potassium solution	15 minims.

Put the prints in the developer, without washing, by gaslight or subdued daylight, and keep turning them over and over (not simply rock the dish, which is quite insufficient to secure even development). The image will come up a red colour in about four to five minutes.

In very warm weather, when the developer is near seventy degrees or higher, add to every ten ounces of developer ten grains of aluminium chloride. This will keep the gelatine hard and protect the film from injury.

If cold black tones are wanted, reduce the time of exposure as well as the quantity of bromide in the developer, taking care not to go to extremes.

When development has been carried to the desired depth, put the prints for a minute or two in a two per cent. bromide of potassium solution. This will stop the action of the developer. Contrary to the experience with all emulsion papers, a Presto print does not reduce in the subsequent toning or fixing, and it is therefore necessary to stop development at exactly the desired depth of the finished picture. If a large batch of prints are to be developed, it is best, in order to keep development under proper control, to make up a good quantity of developer, and to dilute the same.

For every whole-plate print, or its equivalent, that has been developed, one drachm of stock solution should be added to keep up normal strength. Make up fresh solution when the old is discoloured. After five minutes' washing in running water, place them in the toning bath, which may be done in daylight.

ENLARGING.

The best way to judge time of exposure for enlargements is to make a pinhole in the film of the negative in a place which does not spoil the print (pinholes greatly assist sharp focussing during dull daylight). Prolong exposure until a faint trace of the pinhole is visible on the paper when examined by candle light. In developing enlargements use only half the quantity of bromide recommended for contact prints.

TONING.

Sulphocyanide of ammonium	1 drachm.
Chloride of gold	3 grains.
Water	16 ounces.

Turn the prints continually over till they have reached the desired tone (which does not change in the subsequent fixing bath), wash, and fix ten minutes in one ounce of hypo to five ounces of water. Wash well for one hour, and treat same as any gelatine emulsion paper. Have all solutions and washing waters as cool as possible.

The Presto prints can be hardened so as to allow drying between blotting-paper or in artificial heat if, after a half an hour's washing, they are placed for three minutes in a one per cent. solution of aluminium chloride in a vessel which is free from any trace of chemicals whatsoever, and washed again for half an hour.

Replying to Mr. Hodd, Mr. WILKINSON said there was not only a tendency to precipitation of gold if the prints were not washed well after development, but they would blacken all over. Answering a question of Mr. Henderson's as to the time required for enlarging on the paper, Mr. Wilkinson said he gave twenty minutes' exposure at fifteen inches from a No. 5 Bray burner. To an incandescent light nine to ten minutes would probably suffice.

The CHAIRMAN asked if twenty seconds sufficed to produce a developable impression, how long would be required for printing right out ?

Mr. W. D. WELFORD asked if the method of developing the faint image, described by Mr. Wilkinson, was confined to the Presto paper only.

Mr. THOMAS BEDDING said that other print-out papers were amenable to the same treatment, instancing the Paget Company's gelatino-chloride paper, demonstrations with which he (Mr. Bedding) had seen nearly two years ago at Walford, when an exposure of from twenty to thirty seconds in diffused daylight was sufficient to produce a faint image, that was developed up to full intensity and then toned and fixed.

Mr. TEAPE had tried acid development for gelatine paper, but had not got good gradation.

Mr. HODD mentioned that, by development with gelatine paper with the Paget formula, he had succeeded in getting detail that could not be obtained by printing out.

After other discussion the meeting terminated.

Leytonstone Camera Club.—On Saturday, July 27, an outing was conducted by Mr. W. J. Battell to Chingford and the Valley of the Lea, some of the members securing very fine negatives of sunset effects.

FORTHCOMING EXHIBITIONS.

1895.		
Sept. 23	*Leeds.	G. Birkett, City Art Gallery, Leeds.
,, 23–28	*Westbourne Park Institute.	
,, 24	*Royal Cornwall Polytechnic Society.	Edward Kitto, The Observatory, Falmouth.
,, 30–Nov. 2	*Photographic Salon.	Alfred Maskell, Dudley Gallery, Piccadilly.
,, 30–Nov. 14	*Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
Oct. 28–Nov. 2	*Southport.	G. Cross, 15, Cambridge-arcade, Southport.
Nov. 19–21	*Hackney.	W. Fenton-Jones, 12, King Edward's-road Hackney.
,, 28–30	*Leytonstone.	B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

A NOVEL TONING PROCESS.

To the EDITOR.

SIR,—I enclose, for your inspection, a print on bromide paper (Eastman's permanent). The colour is, so I think, a very pleasing sepia. This result was quite an accident, but, not being a chemist, I am at a loss to account for it. This being so, I will give an exact account of the conditions under which it was produced, hoping its investigation by competent workers will lead to a simple and pleasing new "toning" process for this paper.

Wanting a proof quickly, I exposed a piece of bromide paper, developed it with the metol-hydroquinone developer given by you last year in the JOURNAL, found it over-exposed, and, without washing, threw it into an old negative fixing bath. The latter was discoloured, and probably charged with alum, was acid, and had a dirty-coloured precipitate in it. To give a correct impression as to the state of the old fixing bath referred to, I will explain my procedure. It had been used for fixing negatives that would not likely be required again, after taking a few prints ; consequently, having no tap water, the washing was done with a tin pot, while the negatives were held in the hand. In this way the alum bath became charged with developer (pyro-soda), and the fixing bath with both developer and alum.

The print, as I said, was over-exposed, and was also over-developed. After being thrown into the old fixing bath, it was forgotten. On throwing away the bath next day, I noticed that the print had changed colour to what you see it, so I washed it and determined to experiment further.

This want of time has prevented me doing up to the present. The question as to permanency of the image can be perhaps best decided by your keeping the proof, with these notes. I should add, that the image suffered very considerable reduction while in the fixing bath.—I am, yours, &c.,

H. HANDS.

Clyde House, Jubbulpore, C. P., July 18, 1895.

[The print sent has an extremely agreeable warm-brown tone.—ED.]

"WANTED A PRINTING PROCESS."

To the EDITOR.

SIR,—I should be glad if you could kindly inform me of the best printing process (in conjunction with dry plates) suitable for a travelling photographer.

When journeying from village to village the usual printing on silver

paper, toning, fixing, &c., takes up too much time, necessitating a longer stay in the village than is often remunerative. In villages where one is well known, the photographs can be sent on at a later date; but, when seeking "fresh fields," it is often necessary to complete and deliver all orders before leaving, as the stranger is generally treated with suspicion.

I need hardly add that, whatever process is followed, it is necessary that the photographs can be turned out (not only rapidly) in first-class style, as, apart from one's desire to turn out good work, the visits are periodical.

Any hints will be gratefully received from you, Mr. Editor, or any of your readers by—Yours, &c.,

BOHEMIAN.

VARNISHING.

To the EDITOR.

SIR,—Can you explain the cause of the disaster which has come to the negative which I enclose? I was varnishing it, and it all went. I had been trying wet plates for process work.—I am, yours, &c.,

PUZZLED.

[See leading article. We presume the "disaster" was not the smashing of the negative through imperfect packing.—ED.]

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, half-plate W. A. K. lens, iris diaphragm, in exchange for a cabinet hot rolling press.—Address, WILLIAM TURNER, 9 Rushworth-terrace, Halifax-road, Rochdale.

Two outside bent glass shop lamps, each fitted with two Argand burners with bracket complete, offered in exchange for Ross's or Dallmeyer's 12×10 or 13×11 symmetrical or rectilinear lenses.—Address, J. W. HILDER, Matlock Bath, Derbyshire.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

RECEIVED.—Britannia Works Company; Milne & Co. These in our next.

LISTER.—Photographs of the dark flash such as yours are not entirely uncommon, although the results are interesting.

VARNISH AND OTHERS.—The address of the Anglo-American Varnish Company is, we believe, St. Paul's-square, Birmingham.

COLOURED GLOBES.—We cannot say. It is in no way a photographic matter. However, we surmise that any druggist's sundryman will supply the colour.

COPYRIGHT.—As the Photographers' Copyright Union now admit amateurs, there would be no object gained by the insertion of your letter. Probably you were not aware of the fact.

F. E. JONES and others, who send copies of the Monochrome Portrait Company's circulars, are thanked. We have repeatedly drawn attention to the peculiar nature of this firm's business.

X. Y. Z.—If the "comet-like marks" are not due to the cause mentioned by the makers of the paper, we can suggest no other. Some of the prints are stained on the back, which indicates faulty manipulation.

W. ADIE.—If the lens is symmetrical, it matters not whether the back or the front glass is next the negative when enlarging with it. The same remark applies to the combinations when employed as single lenses. Either can be used.

C. H. (Lincoln).—Instead of attempting to make the pyroxyline, we should advise you to purchase it from those who supply it. You will then ensure having the right kind for the work. However, if you still desire to make your own, formulæ will be found in the ALMANAC for different sorts.

A SUBSCRIBER.—If the goods were not supplied to order, they should have been returned at the time for exchange. As they have been kept, we expect they will have to be paid for, less the allowance suggested. However, it is a trade dispute about a very small sum, and should be easily settled.

F. W. MORGAN.—We are afraid we cannot assist you, except to suggest that you advertise your requirements. The most successful workers, as a rule, prefer the ordinary ridge-roof studio, or one of the lean-to form. The excellence of their work is not due to the form of the studio, but to their ability.

J. SCOTT.—The only way to avoid entirely the cracks in negative showing in the prints is to remove the film from the glass by the hydrofluoric method, and transfer it to another plate. Of course, if the film is broken through, that cannot be done. The system you are adopting in the printing is as good as can be for ameliorating the defect.

L. E. N. S.—A portrait lens of fifteen inches back focus should cover more than five inches by four sharply with its full aperture of four inches. Have you examined the back combination to see that the glasses are in their correct position? If they are misplaced, that may account for the small field covered. The maker, whose name is on the mount, had a good reputation in days gone by.

LONDON, N.E., asks "What is the method of mounting photographs known as dry mounting?"—The method is this: The prints are coated with an adhesive—starch, for example—and allowed to dry. They are then trimmed. Next the mounts are slightly damped, the prints placed in position upon them, and then passed through the rolling press. The pressure produces perfect adhesion.

D. BINGHAM.—Enamelled iron dishes are scarcely to be recommended for silver solutions. They would answer all right, provided the enamel is perfect, which is not always the case. Even if the enamel is perfect when the vessel is new, there is always the danger of its getting cracked or chipped with use, and, of course, if the metal is exposed, even in the smallest place, it will decompose the silver solution.

P. MAGUIRE.—One of the most simple forms of battery for the deposition of copper for gravure plates is the Smee. It is the battery most in use by electrotypers, for depositing copper, who do not employ a dynamo. The Daniel cell at one time was much used for copper deposition, but it has very generally given place to the Smee on account of the latter's greater simplicity. The sample of plumbago enclosed looks like a very suitable kind for the work.

H. H. H.—1. A very good retouching medium is given on page 856 of the ALMANAC. It may be used on varnished negatives as well as on unvarnished ones. We cannot give you the formulæ by which the different makers of the commercial mediums compound them. 2. The ALMANAC also supplies formulæ for varnishes, and the same remark applies to them as to the retouching mediums. Makers of commercial articles do not supply us with their formulæ for publication.

J. ROSE.—We have not tried the methylated spirit (containing mineral naphtha) for Mr. Richmond's method of preventing blistering in albumen prints, so we cannot say for certain if it will answer or not. Some samples of this spirit that we have used for other purposes have left a very greasy appearance behind when applied to paper that was very difficult to remove by washing. This, on the albumen surface, might possibly interfere with even toning. Why not put the thing to the test with the spirit supplied in your neighbourhood? There is no legal way of getting the unmineralised spirit except by taking out a licence to purchase it.

T. C. W. writes: "A grocer in the place asked me to quote a price for taking a negative and supplying a process block of his house and shop. I quoted a price, which he thought was too high. He then said he would have the photograph only, which I took; but, as I learnt that he was going to send it to a London house to get the block made, I took the precaution to make the photograph copyright before I supplied him with a copy. Would you advise me to take proceedings as soon as he shows prints from the block, or to wait till he has issued a large number, so as to get more penalties?"—It matters not when the proceedings are commenced, as our correspondent is bound to lose the case, and rightly so too. He was paid for his work, and had no right to the copyright. He has been a little too sharp.

CONTENTS.

	PAGE
LANTERN PROSPECTS	497
A POINT IN THE USE OF CARBONATES IN DEVELOPMENT	498
VARNISHING DIFFICULTIES	499
JOTTINGS. By COSMOS	500
PRINTING OUT PAPERS IN PRACTICE. By J. PIKE	501
TRIMMING AND MOUNTING PHOTOGRAPHS. By EDWARD DUNMORE	502
ON THE PREPARATION OF COLLODIO-CHLORIDE PAPER. By G. H. MOSS	503
THE "FILMAX" HAND CAMERA	504
ON THE USE OF COLOURED LIGHT IN MICROSCOPY. By ARTHUR M. EDWARDS, M.D.	505
MR. H. P. ROBINSON AND THE CONVENTION	505
TOURING "TIPS." By JOHN A. HODGES	506
GWYNNE'S NEW DOUBLE CARBON ELECTRIC LAMP	507
THE PREPARATION OF PLAIN SALTED SILVER PAPER. By G. H. MOSS	507
THE THREE-COLOUR PROCESS	507
ON THE DECOMPOSITION OF THIOSULPHURIC ACID. By A. F. HOLLEMAN	508
OUR EDITORIAL TABLE	510
NEWS AND NOTES	510
MEETINGS OF SOCIETIES	510
FORTHCOMING EXHIBITIONS	511
CORRESPONDENCE	511
EXCHANGE COLUMN	512
ANSWERS TO CORRESPONDENTS	512

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1841. Vol. XLII.—AUGUST 16, 1895.

OPTICAL AIDS TO FOCUSSING AND RETOUCHING.

It is not to every one that is given the power of focussing with the extreme of sharpness without the aid of some one or other of the numerous magnifiers now supplied by enterprising dealers in photographic apparatus.

Amongst other aids to vision for this purpose, we have long advocated and employed the simple watchmaker's eyeglass, set in a light horn mounting; and this primarily for the reason that, after a little practice, it can be held firmly by the muscles surrounding the eye, permitting the release of both hands, which can be relegated to other work.

Some time ago, when out photographing with a friend who was somewhat short-sighted, we noted and rather admired the ease and accuracy with which he effected the delicate operation of bringing his object into sharp focus with his unaided vision, his eyes being brought to within about five inches or so from the ground glass of the camera, and this led to the instituting of a comparison between his method and ours, to the disadvantage of the latter. If any one applies to the optician for a pair of five-inch focus spectacles, as we lost no time in doing on the occasion referred to, he may find, as we did, an impossibility of seeing sharply one and the same object with both eyes. The object—in this case the image on the focussing screen of the camera—is seen distinctly with either eye, but seldom with both simultaneously. This, at first sight, would render strongly magnifying spectacles useless in a large measure for our present object, which is to make use of *both* eyes; but a little optical reasoning will speedily show the cause, and indicate the complete cure for this.

In looking through glasses of medium strength, the eyes, if healthy, possess the power of adjusting their axes so as to converge to a considerable degree; but, when those of very great power, such as are suitable for extremely aged persons, are employed, such glasses being supposed to be of short focus, say, from four to six or seven inches, the eyes have not powers of convergence sufficient to meet the greater demands made upon them. To remedy this, the glasses must be decentered—that is to say, the centres of the lenses must be placed a little nearer to each other than the centres of the eyes. In this way the axes of the eyes are not directed through the axes of the lenses, but a little to the outside of them; hence, when looking at an object under this condition, the position of the object is displaced, and appears as if it were the apex of a triangle, of which the base is the line separating one eye from the other; in other words, the glasses must be mounted a little nearer together than usual, and this distance is so small as to be attained even by the rude expedient of bending the arch of the spectacles a little, by which the centres of the glasses are brought closer together.

We obtained a very cheap pair of five-inch glasses, and, although they would not give a clear image when first tried, we softened the bridge by heat, and bent it as just described, thus practically decentering the lenses, with this result that we have now a pair of focussing spectacles that give a clear, bright image on the ground glass, enabling both eyes to be used when focussing, and their use is not accompanied by the slightest strain upon the eyes.

The proper thing to do in the accomplishment of the object desired is to put oneself in the hands of a competent optician, and instruct him to furnish a pair of glasses of the suitable short focus—say five or six inches—and with the required amount of decentering which, as we have stated, need be but very little. Of course, the best and clearest vision is obtained, theoretically at any rate, when there is perfect coincidence of the axes of the eyes with those of the glasses, but for our purpose decentering is a necessity to enable the necessary displacement of the object to be attained; also, in proportion to the distance between the axis of the eye and that of the lens through which the vision is directed, so does the lens show prismatic colours which have their culmination when the extreme margin of the lens is employed, but this is supposing a case that in all probability will never occur. We have had glasses decentered to a needlessly great degree for ordinary practice, and have not been able to appreciate any colour arising therefrom.

We have hitherto spoken of this as applied to focussing, but a possibly still more useful application of the system will be found in the retouching of negatives. Usually a magnifier of large diameter to accommodate both eyes is employed, for it is a popular fallacy that a large glass of this class is more powerful than a small one. *Power*, in a lens used for magnifying or as an eyepiece, depends upon the convexity of the surface, the flatter the curve the less being the magnifying power possessed by the lens. A very large lens, therefore, cannot be made to magnify so much as one having a small diameter, because a rounder curve—a shorter radius—may be imparted to the latter than can possibly be done to the former. Some writers on the subject have recommended, for retouching, a very large lens, something similar to what is used in the larger kinds of graphescope, one through which any object

could be viewed with both eyes—a desirable condition being that the axes of the eyes should not pass near to the edges, but as near to the centre as possible. Now, as we have shown, a lens of this kind implies only a very slight degree of magnifying power, and, were it of greater power and consequently smaller diameter, the axes of the eyes would be opposite the margins, and confusion would arise from the commingling of the prismatic colours inevitably caused thereby.

From a consideration of the foregoing, as well as from trials in actual practice, it will be found that in a pair of powerful decentered glasses mounted in spectacle frames will be found a cure for such trouble as may arise in either focussing or retouching. One has the use of both eyes, there is a great degree of magnifying power, and the image is bright and sharp, owing to there being no visible traces of prismatic colours. For these resons we recommend this system; it costs little, but it is worth much.

PHOTO-CHROMY AS IT IS.

Last week, it will be remembered, we mentioned that the specification of a patent had just been published for producing "carbon" pictures in colour by what has become known as the three-colour process—or processes. We also referred to the identity of the newly patented process with the one for which a patent was secured by Ducros Duhauron some twenty years ago. The method, though it lay in abeyance and unpractised for so long, really forms the foundation, if not the actual process itself, of the present system, whether in the printing press or not, of three-colour photography. At no time within the photographic era has so much attention been given to mechanical photography, and colour photography in particular, as just now. But it is not perfect yet, and it will be as well to at once look at the matter fairly in the face in that light.

Vogel and others—as did Duhauron—have told us that, theoretically, with three negatives taken with suitable light filters, and then printing them in red, blue, and yellow, superimposed, we ought to get the colours of the original true to nature. But have we obtained them so in practice? After a kind we have, but they have left much to be desired toward perfection. Some excellent examples were shown some time ago at a meeting of the Royal Photographic Society, produced, if we remember rightly, at the Russian State Printing-office. They were good; but it came out afterwards that, in working, where one perfect print was obtained, though the greatest care and skill was used, there were a dozen and more that were not. We have seen some good work by three printings—and untouched—that was produced in Germany, though, good as it was, it could not be compared with what was being regularly done with four or five printings, and with some little hand work on the negatives, as well as on the printing plates. Three-colour work has also been done here which has been very interesting and, at the same time, promising; but, it must be confessed, it is a long way from perfect, especially taking the general run of an edition.

Let us now look at the commercial side of the question. Here, of course, the general public is an important factor in the case. It looks at results from a practical point of view, and it wants them as good as they are obtainable, and, consequently, that is what publishers aim at supplying. It may be explained to the public that the method by which the, to them, inferior work is produced is a photographic one, and should therefore yield the colours true to nature, but it will not like it any better for that. It may look upon one or two such examples occasionally as being interesting and as showing progress, but as nothing else, while better things by other means are forthcoming. Publishers are fully aware of this, and, as a matter of business, they care very little how the results are obtained so long as they are what the public, for whom they cater, appreciate.

Admitting, as we do, that obtaining three negatives with suitable light filters, and prints from them with three-coloured inks is correct in principle, it is well to look if the method, even if perfected, is the best for commercial work. The taking of three negatives that require no hand work upon them involves less labour than taking, say, four or five that have to be retouched. Three printings also involve less operations than do four or five, but it does not follow that the fewer operations are less costly if they entail more care and skill in the after-manipulations, as well as more spoilt prints in the end through the colours not being properly blended, want of accuracy in registration, &c. With our present machinery, one or two extra printings is not a very important item when additional excellence is a consideration.

Some photo-chromos of large size, reproductions of paintings, under the name of aquarelles, are produced on the Continent, and very fine they are as transcripts of the originals, and they command a large sale at high prices. But we happen to know that in their production more than three negatives are used; also that colour filters are not solely relied upon, and that hand work is liberally expended on the negatives. The prints are obtained in four, five, or even more printings, according to the requirements of the colours in the originals, collotype, and even lithography, for some colours, being the method adopted. With the greater number of printings there is the greater choice in the pigments that may be employed in the inks. When that is confined to three only, they must be restricted to exact tints, and it so happens that those colours, or some of them, which are the most suitable for the work, are very fugitive in their character when exposed to light.

This article is penned in no cavilling spirit, for we would not for a moment say a single word to discourage experimentalists in any process or means for its improvement. It is written from a purely business point of view, to point out that, however correct the three-colour system—whether worked with fatty inks or as the carbon process—may be in theory, it is as yet far from satisfactory in a commercial sense, and that other methods yield results with which the general public are better pleased. This is a reality that experimentalists should keep in mind, and, whilst seeking to improve the three-colour system, not lose sight of the fact that it is the results that the public and publishers look at rather than the means by which they are obtained.

Process Work in a Blue Book.—It is not a new thing to see a government publication illustrated by photographs, but we believe that process blocks have been employed for the first time in a Blue Book recently issued. The subject is a "Report of Departmental Committee upon Monmouthshire Slate Mines, with Appendices." It contains eight reproductions of photographs, five of which were taken underground by Mr. Burrow, whose mine interior photographs received the award of a medal at a recent Exhibition of the Royal Photographic Society.

Expensive Lenses Unnecessary for Some Astronomical Photography.—There is an impression commonly

revalent that, for astronomical photography, lenses of great value re required; but there is the authority of Professor Barnard for aying that this impression—superstition it might almost be termed —is erroneous. Professor Barnard took a magnificent photograph vith a six-inch-diameter lens (portrait lens, be it noted) of a certain egion of the sky (near Antares), giving it two hours and twenty ninutes' exposure. A vast nebula was shown, intricate in configuraion, and gathered in cloud-like forms. Then another photograph vas taken, giving a fraction less of exposure, the lens used being a ommon magic-lantern lens of an inch and a half diameter and five nches' focus. The result was even more valuable than with the ix-inch Willard, for it gave more details, and further showed he nebula to be still more intricate, and, to certain structures, to xtend from 15° to 20° to the east.

Inefficient Process Work for Showing Exact Astronomical Data.—Our opinion as to the superior value of purely photographic blocks over those done by the engraver is well nown, but another aspect of the matter is shown by some recent orrespondence in the *English Mechanic*, in respect to a block repreenting a nebula from one of Mr. Isaac Roberts's negatives. Many ueries are put as to the meaning of various appearances, the explanations regarding which may be summarised as follows: Streaky ppearances due to the spreading of the printer's ink, and the streak o a printer's scratch; another set to accidental printer's touches, a treak due to a scratch on the negative, two streaks and two patches lue to printer's accidents; and so on for a further long list. Now, till firmly adhering to our previous views, it appears that it would e an excellent plan, where a large variety of detail and minute star mages had to be printed, for two separately produced blocks to be printed side by side; it would then appear that any detail that could be seen on each was the representation of an actual phenomenon, in so far, at least, as it did not emanate from a damage to the negative.

Fading Negatives of Stars.—The value of the photographic negative as a permanent record of astral phenomena is, perhaps above all others, the one quality that would be unquestioned, yet it is embarrassing to learn that this very point of permanency is the subject of grave doubt. Writing in the *Bulletin* of the Astronomical Society of France, Mdlle. Klumpke, the directress of the *Bureau des Mesures* of the Paris Academy, gives a *résumé* of the work of past astronomers in the production of star catalogues, and brings her remarks up to date by a reference to the great star chart now occupying so many observatories, the progress of which we have recently described. Mdlle. Klumpke gives three millions as the estimated number of stars the finished chart will contain, but she says the impressions on the negatives are certainly not permanent. Dr. Isaac Roberts, writing to the editor of the *Observatory*, gives details of the disappearance from his negatives, during the last few years, of the smaller images. He instances one plate containing originally 364 star images from which, at the present time, no less than 140 star images had disappeared. This news is very grave from other points of view than the astronomer's. If a star image will vanish, why not the finer details of a portrait or landscape? It is certain the matter ought not to rest here unless it can be shown that Dr. Roberts's plates have been improperly treated, insufficiently washed, for example.

Detection of Sulphates, Sulphites, and Thiosulphates in presence of each other.—In view of the increased interest lately taken in the constituents of the decomposed hypo fixing bath, a special interest will attach to an article under this title recently published in the *Chemical News** over the signature of R. Greig Smith, B.Sc. The writer purports to give, not an entirely new process, but a completely worked out method, such as is not to be found in detail in the text-books. If hypo be present, the solution must be largely diluted, or the thiosulphuric acid will be converted into sulphur and sulphuric acid. Barium chloride with a good quantity of ammonium chloride is added. Hydrochloric acid is next added, drop by drop, till it is evident there is no further solution of barium sulphite and thiosulphite, and that sulphate only remains undissolved; the solution filtered through good paper moistened and free from pinholes. If there be too much hypo present, the clear solution will quickly go cloudy, and a fresh start with a weaker solution must be made. A solution of iodine is added to half of the solution till of a permanent yellow tinge. A white precipitate indicates the presence of a sulphite which has been oxidised by the iodine to sulphate. In the absence of a decided precipitate, the iodine-treated and the untreated halves should be compared together. The slightest trace will be discovered. The two halves are mixed, and iodine again added if, on mixing, the yellowing disappears. The solution is filtered and again divided into two halves as before. There is no need to filter out any slight turbidity. Bromine water is added to one of the halves, when any thiosulphate in the original solution shows itself as a white precipitate of barium sulphate, readily seen on comparing the two halves. The thiosulphate is by the iodine converted to tetrathionate, which is oxidised by the bromide to sulphate. Hydrosulphuric acid would interfere with these reactions, and ought to be eliminated by bubbling carbon dioxide through the solution until the gas escaping from the tube no longer darkens lead paper. In last week's *Chemical News* the subject is further discussed by W. F. Bloxam, B.Sc., and methods of testing still further sulphur compounds given, but the paper is too intricate to be capable of useful abstractions in these columns.

* *Chemical News*, vol. lxxii. p. 39.

A POINT IN THE USE OF CARBONATES IN DEVELOPMENT.

II.

Adverting to our article of last week, it is not at all difficult to understand why the two classes of alkalies should behave differently under the circumstances we instanced; but, in order to assure ourselves that such was the actual explanation, we have made the following experiments, the same stock pyro solution being used throughout.

Two ounces of developer were mixed containing 6 grains of pyro, 1 grain bromide of potassium and 6 minims of strong ammonia. The first plate developed showed the first traces of image in forty seconds, and development was complete in about four minutes and a half. The second plate showed the image in about ninety seconds, no further addition of ammonia being purposely made up to that point; but, on adding two or three drops of the ten per cent. solution, the action proceeded nearly as rapidly as in the first case, and the completion of development did not occupy much longer. Three other plates were subsequently developed in the same solution, fresh ammonia being added as apparently required. No actual comparison could be made of the results, owing to the constantly changing constitution of the developer; but the developing energy showed no signs of abatement, though the negatives differed in the matter both of clearness and vigour.

A similar quantity of developer was next made, containing, instead of the ammonia, 40 grains of carbonate of soda. The first image began to appear in a little over a minute, and development was complete in six minutes. The second image appeared faintly in two minutes and a half, and was apparently finished in a little over fourteen minutes, being then apparently as dense as the other, but, on fixing, was found to be less vigorous in the lights and veiled in the shadows. A third plate was then placed in the solution, but at the end of five minutes no image had appeared; so it was transferred, after washing to a fresh solution of the same constitution, when it came up as quickly as the first, but with a slight veil as if from the prolonged action of the first solution. The latter was then strengthened by the addition of 40 grains more carbonate and another plate immersed, but neither prolonged action nor further additions of carbonate would produce a satisfactory image.

Similar results as regards comparative energy of action were obtained when sodium hydrate was used in competition with the carbonate; but, as regards the comparative rapidity of action, we shall not speak, as the quantity of restraining bromide necessary to place

the hydrate on equal terms with the carbonate would require to be ascertained accurately, which was not done.

With the newer developers, notably metol, the behaviour of the carbonate is somewhat different, and this brings us back to our old experiences that caused the relinquishment of successive development. It is well known that amidol, and also metol, para-amido-phenol, and similar agents owe as much of their developing agency to the sulphite used with them as to the alkali. It is not to be wondered at, therefore, that when the carbonate is employed with metol and with "meto-quinone," that the developing power remains after several plates have passed through the solution; but the vigour and density decrease with each plate until, after two or at the most three developments, nothing but a flat feeble image results.

It was this behaviour of the combined solution that puzzled us, and caused us to give up using the solution a second time; for, whereas the first operation produced strong vigorous negatives, succeeding ones were inferior to metol alone. This is now quite explicable, since hydroquinone being present in a way helped; but, perhaps rather checked by sulphite, and comparatively little influenced by the carbonates while strongly acted upon by restrainers, is practically thrown out of action in the combined developer after the first time of use, and the solution for all actual purposes is reduced to an over-restrained solution of plain metol.

Besides this action in repeated development, it is easy to understand why a solution of pyro and ammonia, or, indeed, any other reducing agent in conjuction with a caustic alkali, should give a better result with extremely short exposures than is the case when the carbonates are used. The latter, as we have shown, become increasingly restrained as well as weakened as development proceeds, so that, in the case of an under-exposed plate just at the very time when its fullest strength is required in forcing out detail, it is found to be in a reduced and exhausted condition. We know perfectly well that, in the case of pyro and ammonia under such circumstances, it is worse than useless to strengthen the alkali, the only chance being perseverance with a comparatively mildly restrained but moderately energetic developer, conditions the very reverse of those that prevail in the case of carbonate after bringing out the main portion of the image.

The moral of all this is, then, that those who wish to economise by repeatedly using the same solution, must relinquish the use of the carbonates and take to one or other of the caustic alkalies, as also must those who wish to make the most of short exposures. This has already been done to some extent with the newer developers; but the practice is, after all, only a reversion to the original plan. Those who elect to cling to carbonate of soda on the score of convenience may find a way out of the difficulty by rendering it caustic by means of calcic hydrate; but this will, of course, involve a thorough overhaul and alteration of the formula.

However, having pointed out what we believe to be a hitherto unrecognised point in the use of the carbonates, we leave our readers to derive what benefit they may from the explanation.

PHOTOGRAPHING LIGHTNING.

Some few years back the Meteorological Society issued an appeal to photographers asking them to endeavour to obtain photographs of lightning flashes with a view of studying their nature, and at the same time published a series of suggestions as to the best methods of procedure. These, if we remember rightly, amongst other things, directed that the camera, already focussed, and with the plate in position, should be pointed to that portion of the sky from which the best harvest of results was to be expected, and, the lens having been uncapped, the instrument left to wait events. At any rate, we have seen successful negatives obtained in this manner, in some of which two and even more flashes have been impressed at different times. But, in such a storm as that which passed over the metropolis and surrounding districts on Saturday night, such a method would, we imagine, be utterly futile; indeed, under such circumstances, we question whether any satisfactory result would have been at all possible, except by the merest chance. Not only were the flashes numerous but were impartially scattered over every portion of th sky, so that the whole atmosphere was rendered luminous by an almost constant pulsation of sheet lightning of greater or less brilliancy. Obviously there is not much to be gained in attempting to photograph sheet lightning, and, though the far greater brilliancy of the forked, or ribbon flashes would give them an advantage over ordinary "sheet," we think it more than probable that the almost incessant flicker of Saturday night would, in a very brief space of time, have obliterated any chance of securing even the most vivid streaks of fork or ribbon. Although we had a camera ready, we judged it a hopeless task to use it, for, even with the slowest plates we could have used, the prospects of general fog were too great. But for surrounding objects obstructing our view of all but sky, we should have attempted a terrestrial picture, with lightning as the illuminant—a, perhaps, not altogether new phase of photography by electric light. In one almost blinding flash, the whole of the western heavens were lit up by a blaze of light resembling a brilliant magnesium flash-light; but, through all the brightness of the sheet, three or four separate vermicular streaks of intensely vivid ribbon lightning were so overpoweringly distinguishable as to repeat themselves on the retina in clear carmine in the momentary darkness that followed. With a much less brilliant display than that particular one we have little doubt that a fully exposed landscape could easily have been taken.

THE ACTINIC VALUE OF LIGHTNING.

While on the subject of lightning, we may mention a circumstance that goes far to prove the intensely actinic nature of lightning, and its richness in the rays of higher refrangibility. Phosphorescent sulphide of calcium is known to be excited chiefly, if not wholly, by the rays of the blue and violet end of the spectrum, and not at all by the green and yellow, while the red rays actually quench its luminosity. While gas or lamplight have little effect in exciting it, and dull daylight scarcely more, magnesium renders it brilliantly luminous, excelling in this respect even sunshine late in the day, or in the winter months. During the storm of Saturday, chancing to enter without a light one of our workrooms, we were surprised to see a bright light on one of the shelves close to the window, through which in a moment more a flicker of sheet lightning was seen. The source of light proved to be a bottle of sulphide of calcium, and the remarkable part of the business is that, although it has stood in the same position throughout the whole of the present summer, we have never previously noticed its presence, although we have been in the room after dark almost nightly. Out of curiosity, the bottle was wrapped in brown paper, and next morning examined in the dark, when it was still strongly luminous. Exposed again to diffused daylight, and again placed in the paper wrapping, it was examined after a similar interval of time, when the luminosity produced by daylight was found to have almost entirely disappeared. Hence, we argue that, for photographic purposes, lightning is at least equal to diffused daylight.

THE EFFECT OF THUNDERSTORMS ON GELATINE PLATES.

It is not surprising that the recent thunderstorms have brought with them their crop of troubles. In years gone by, when emulsion-making was a more common pursuit than it is now, numerous were the failures that were, rightly or wrongly, attributed to thunder or to an electrically charged atmosphere; while to those engaged in other industries, where glue or gelatine are employed, as well as to others in the dairy business, the complications arising in "thundery" weather are well known. But we had imagined that, when the emulsion had been spread upon glass or celluloid and dried, it had passed beyond all danger of injury from such a source; but such does not appear to be the case, if we may believe—and we see no reason to doubt the accuracy of the diagnosis—a statement just to hand from a well-known photographer. It seems that a number of negatives, taken on Saturday afternoon, were left washing all night, and when taken out of water in the morning were found to be ruined, the films having become soft and slimy, and in some cases

aten into holes. The cause is set down by our correspondent to the previous night's storm—a view which is strengthened by the fact that the same plates have been treated in precisely the same manner during the hot, sultry weather of a couple of months ago without the slightest detriment. We remember a similar occurrence in our own experience some years ago, which puzzled us greatly at the time; but, as it was nearly this period of the year, perhaps there had been a thunderstorm about to account for the trouble.

ORTHOCHROMATIC PHOTOGRAPHY WITH ORDINARY PLATES.

[Photographic Society of Philadelphia.]

CAN colour screens be made to secure orthochromatic photographs with ordinary plates? I have selected from hundreds of spectrum photographs eleven which appear to show not only that they can, but also the reason why almost everybody who has tried has failed to obtain such results.

The plates used were Seed ordinary, sensitometer No. 27. The made-up screens were coloured films of gelatine and collodion on selected plate glass, sealed by cementing to another plate glass—a method which I published ten years ago, but which has recently been credited to a writer who merely republished it without acknowledgment. Only three dyes are represented, although many others give just as remarkable results.

The photo-spectrograph—the fifth one that I constructed—contains a train of light crown-glass prisms and an ordinary photographic lens. Crown-glass prisms were used because they are more transparent to the dark violet and ultra-violet rays than flint-glass prisms.

The photographs are all of the solar spectrum, made on very clear days, between one and four o'clock p.m., as follows:—

1. Ordinary photograph.
2. Through light yellow glass.
3. Through deep yellow glass.
4. Through deep naphthol yellow in gelatine (brilliant light yellow).
5. Through light chrysoidine in collodion (impure yellow).
6. Through medium chrysoidine in collodion (deep orange).
7. Through deep chrysoidine in collodion (orange red).
8. Through multiple yellow in collodion (bright golden yellow).
9. Through multiple yellow and naphthol yellow (bright golden yellow).
10. Through deep chrysoidine and naphthol yellow (orange red).
11. Through lighter naphthol yellow.

The photographs are submitted for examination, and I have also made a drawing representing the density curves in such a manner that they may be compared at a glance. The curves are drawn by the eye, and are not, of course, strictly accurate, but are sufficiently so not to be misleading for the purposes of this investigation.

The first curve in the drawing marked "A" represents the luminosity of the spectrum.

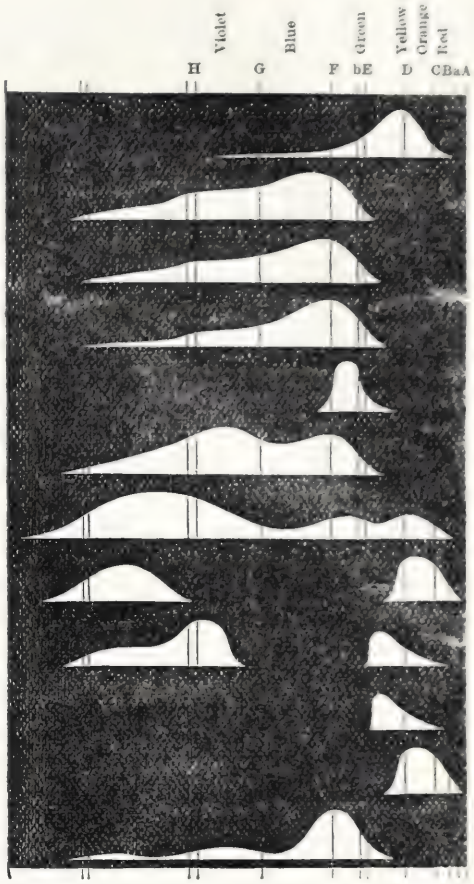
It will be seen that the photographs through yellow glasses differ so little from the ordinary photograph as to indicate no material advantage in the use of a yellow glass with ordinary plates. It is true that the deep yellow glass perceptibly reduces the relative action in the ultra-violet and violet, but the maximum action is still in the blue or blue-green, and neither the ultra-violet nor violet are cut out, nor is there any perceptible action in the yellow.

The deep naphthol yellow, on the other hand, although several shades lighter to the eye than the deep yellow glass, cuts out completely all of the ultra-violet, violet, and violet blue rays, confining the action chiefly to the blue-green and green. It is evident that with this screen green and light yellows (which reflect the green rays) should photograph lighter than true blues, showing thereby a very distinct gain over ordinary photography for many subjects.

The three photographs through chrysoidine show how little may depend upon the kind of dye used, and how much on the quantity. A chrysoidine screeen could be made so light that it would not remove the point of maximum action out of the blue; the lightest screen used moved it into the violet, while a deeper one moved it into the ultra-violet, and a still deeper one gives the strongest maximum away off at the other end of the spectrum, in the orange-red.

The multiple yellow screen cuts out all of the blue and blue-green of the spectrum, and carries the action well into the red, with a maximum in the yellow-green; but, although this green is an intense golden-yellow to the eye, the strongest action is in the dark violet, and extends a long way into the ultra-violet. More than three-fourths of the total action is by dark violet and ultra-violet rays, although a spectroscopic examination under ordinary conditions would not discover the small amount of violet light that gets through.

The addition of the naphthol yellow to the multiple yellow does not noticeably alter the colour of the screen, yet, by cutting out the residue of violet and ultra-violet, confines the action to the yellow-green



yellow, orange, and red rays, the strongest action being in the yellow, green. Even this screen is lighter to the eye than the deep yellow glass, yet secures on the ordinary plate *relatively* more action in the orange and red than any yellow screen will give with commercial-isochromatic or orthochromatic plates.

The most promising combination of all is that of chrysoidine and deep naphthol yellow. The deeper chrysoidine screens do not transmit any violet light than can be detected in the spectroscope, even with direct sunlight, open slit, and blue glass to screen the orange-red and yellow rays; yet, without the addition of the naphthol yellow or an equivalent, most of the action is at the violet end of the spectrum. Reference to the chrysoidine screen photographs will show that with this combination the action can be not only confined to the more luminous portions of the spectrum, but that, by varying the ammount of chrysoidine, the maximum action may be kept either in the green, yellow-green, yellow, or orange, as desired.

A gaudily coloured chromo-lithograph was photographed through all of these screens except the lighter naphthol yellow, and the result was in each case what would have been predicted from an examination of the spectrum photographs, except that, when the screens transmitted rays at both ends of the spectrum, the relative action by the more refrangible rays was much greater than the spectrum photographs indicated. For instance, in the spectrum photograph made through the deep chrysoidine, about 40 per cent. of the total amount of action appears to be at the red end, yet the exposure for a street view had to be increased to about eight times when the naphthol yellow was added. It was thus proved that even with the crown-glass prisms the photo-spectrographic test did not indicate anywhere near the true photographic value of the more refrangible rays. What is equally remarkable, the same chrysoidine screen which, in the camera, allowed most of the work to be done by invisible rays, showed no action whatever in the ultra-violet when tested in a costly direct-vision photo-spectrograph, not even when the exposure was so long as to produce considerable halation and general fog from scattered light. No doubt, large direct-vision prisms, made with some of the new Jena glasses might show a different result.

The chromo-lithograph contained the following colours: three shades of blue, strong green, deep yellow, deep red, and purple. Photographs made through the yellow glasses, and all screens transmitting ultra-violet rays, rendered all blues white, or nearly so, and yellows and dark greens nearly black. The photograph made through deep naphthol yellow rendered green and deep yellow and medium blue all as medium light grey; red as black. The photograph made through combination of multiple yellow and naphthol yellow rendered ruby red and dark blue about alike, green lighter, and yellow nearly white. Although the density curve in the spectrum photograph does not indicate that this is an ideal screen, it is a *yellow* screen that gives truer results on ordinary plates than yellow glasses give on commercial isochromatic or orthochromatic plates. The combination of deep chrysoidine and naphthol yellow rendered dark blues and greens almost black; delicate sky bue, darker than bright yellow; yellow, not quite white; deep red, rather too light. A compromise between this result and the one before it would be better than either; it could be obtained by using a little less chrysoidine. Such a result is shown in No. 5. The exposures (in direct sunlight) varied from a small fraction of a second for the ordinary photograph to two minutes for the one made through combination of deep chrysoidine and naphthol yellow. The exposures for the spectrum photographs also varied from a fraction of a second to two minutes, the aim being to obtain good, but not excessive, density in the parts showing most action, with the same development that would ordinarily be given for a correctly exposed landscape.

The results which I have presented to your notice lead me to conclude:—

First.—That the relative amount of action by the dark violet and ultra-violet rays in ordinary photography is far greater than has been generally supposed.

Second.—That spectroscopic examinations of colour screens, and even photo-spectrographic tests as ordinarily conducted, are not competent to discover their true photographic valve.

Third.—That the first essential in a colour screen is that it shall cut out the dark violet and ultra-violet rays, and that to failure in this particular is due the inability of most experimentalists to obtain improvement in colour rendering by the use of colour screens with ordinary plates.

Fourth.—That, with suitable compound colour screens, much truer colour values can be obtained on ordinary plates than yellow glasses will give on commercial isochromatic or orthochromatic plates.

This is not a new discovery. I demonstrated the facts by actual experiment, and showed results which should have been as conclusive as anything I have here, at the Franklin Institute, nine years ago. In fact, the most striking illustration of the value of the method which I have with me to-night is the identical photographs which I then showed, in comparison with the Prang chromo from which they were made. My excuse for bringing the subject up again is the prevailing ignorance of the facts, as indicated by such statements as the following, which I quote from well-known photographic journals:—

"Questions that have been addressed to us in regard to the employment of the yellow screen with ordinary or non-colour sensitive plates, as well as some remarks on the subject that have recently been published [in *Journal of the Camera Club*, London, February, 1894, page 28?], indicate the existence of erroneous ideas on the point. . . . We are writing for the express information of many of our professional and amateur friends. . . . Years back, to test this point, of the influence of the yellow screen on ordinary plates, we subjected the matter to experimental examination, the issue being that the only observable effect was to increase the exposure without altering the relative tone renderings, and more recently we have repeated the experiment with the same results. . . . The idea is false in theory and unsound in practice. . . . We unhesitatingly negative the assumption that for any practical purposes the use of a yellow screen with sensitised plates not corrected for colour is of the slightest value."

"It is now clearly determined that the use of orthochromatic plates for rendering correct colour values is absolutely necessary."

"I have often heard it said, and often seen it written, that a yellow screen gives an isochromatic or orthochromatic effect with an ordinary plate. My opinion of a man who says this is that he is not a fool, but a deliberate fibber, if not worse. No one who has ever tried this once would make the statement. And I most emphatically deny that a yellow screen has any effect on an ordinary plate, except to make the negative worse than it otherwise would be."

Of course, this is not the kind of orthochromatic process to be recommended for practical purposes in a London fog. It is quite practicable for the reproduction of paintings in direct sunlight, or even in the studio when the light is good. I have photographed a good many paintings in the studio by this method. It is also practicable for general outdoor photography where time exposures can be given. I have employed it with unqualified success when thousands of miles from home, and having no colour-sensitive plates with me. At Pompeii I gave an exposure of five minutes on a mosaic fountain. The guide, who evidently took me for an inexperienced amateur, said it was not necessary to give such long exposures; he had seen the same object photographed with "cap off and on" exposure. Such a result as I obtained would justify a half-hour's exposure if necessary.

Some of the compound screens give better results with ordinary plates than ordinary yellow screens do with commercial isochromatic or orthochromatic plates, and the method is therefore to be preferred under some circumstances, although it is possible with quite different compound screens to obtain the same results on the commercial colour-sensitive plates with shorter exposures. For instance, a combination screen of brilliant yellow and fuchsine can be made that will secure on a commercial isochromatic plate a photograph which pretty accurately represents the luminosity of the spectrum, and always gives nearly photometrically correct translation of colours into monochrome when used with such plates. The naphthol-yellow and chrysoidine screen with ordinary plates requires much longer exposures than the brilliant yellow and fuchsine screens with isochromatic plates, but the results are substantially the same.

F. E. Ives.

THE USE OF DRY PLATES IN PHOTO-ENGRAVING.

[Photographic Society of Philadelphia.]

Since the advent of what is now called the half-tone photo-engraving method, the making of the negative has, by the majority of operators, been accomplished by the wet-collodion process, as the more rapid gelatino-bromide plate was not amenable to the treatment of clearing and intensifying used in the wet process. It is my purpose to show and prove that, by the use of a specially prepared process plate I have recently introduced, equally as fine half-tone blocks are produced as by the wet-plate process, and are now used by firms who formerly used the wet-plate method, but have laid it aside, to the exclusive use of the gelatine process plate. As the gelatine plate is always ready for use, and more sensitive than the bath plate, and the time taken up in developing, clearing, and intensifying being about the same as the wet plate, much valuable time is saved, besides relieving the operator of preparing collodion, keeping a silver bath in order, &c. The same plates are used in producing negatives of pen drawings, reproduction of wood-engravings for transfer to stone, or producing deep-etched blocks. Besides possessing many advantages over the wet-collodion plate, objects can be photographed direct from the original. Instead of copying a photograph, the plates are furnished as plain strippers and orthochromatic.

The following solutions are required for developing, clearing, fixing, reducing, and intensifying the process plates:—

Developing Formula for Half-tone Negative (Screen) and Negatives of Pen Drawings.

No. 1.

Neutral oxalate of potash	1 pound.
Warm water (free from lime salts)	48 ounces.

Add a strong solution of citric acid, enough to just turn litmus paper red.

No. 2.

Sulphate of iron	½ pound.
Warm water	24 ounces.
Sulphuric acid	15 drops.

No. 3.—*Restrainer.*

Bromide of potassium	½ ounce.
Water	10 ounces.

To Develop.—To 5 ounces No. 1 add 1 ounce of No. 2 and 10 drops No. 3.

To get an even-developed plate, use sufficient developer to well cover the plate, allow to act until, on looking through, the image appears quite dense; then wash and place in clearing bath one or two minutes.

No. 4.—*Clearing Bath.*

Water	20 ounces.
Alum	1 ounce.
Citric acid	¼ „

Again wash and immerse in fixing bath.

No. 5.—Fixing Bath.

Water	6 ounces.
Sulphite of soda	2 „
Water	2 „
Sulphuric acid	1 drachm.
Water	48 ounces.
Hyposulphite of soda	1 pound.
Water	8 ounces.
Chrome alum	1 ounce.

Dissolve in the order given, add the solution of sulphuric acid to the sulphite of soda, add this to the hyposulphite, and finally add the solution of chrome alum.

No. 6.—Reducing Solution.

Ferridcyanide of potassium	50 grains.
Water	10 ounces.

No. 7.—Bleaching Solution.

No. 1.

Bichloride of mercury	240 grains.
Chloride of ammonium	240 „
Distilled water	20 ounces.

No. 8.—Cyanide of Silver Solution.

Distilled water	6 ounces.
Cyanide of potassium, C. P.	60 grains.
Distilled water	2 ounces.
Nitrate of silver	30 grains.

Pour the silver into the cyanide solution while stirring, and mark the bottle "Poison."

In place of the latter, a ten per cent. solution of sodium sulphite may be used.

Notes on Using the Foregoing Solutions.—Supposing that six ounces of developer are mixed, and a number of plates are developed, if bulk is reduced to four ounces, add two ounces of a fresh mixture and no bromide; also, if what is left is placed in a bottle, on using it the next day, mix half of it and half of fresh mixed developer, and it will be found to work more uniformly than developer freshly mixed, the old acting as a restrainer. *Always* use No. 4 solution after washing off the developer, as its function is to remove any trace of iron left in the film (which, if not removed, will leave an opalescence in the clear spaces), also to harden the film and prevent its swelling up. After a stay of not less than two minutes in No. 4 solution, the negative is thoroughly rinsed and placed in No. 5 fixing bath, and, when thoroughly cleared, removed. Do not proceed to wash out the hyposulphite, as is ordinarily done, but simply *pass* the negative through water to remove the surplus hypo solution on surface, then examine with a magnifying-glass to determine whether any reducing or clearing is required, either as a whole or locally, which I consider is best done at this stage, as the hypo left *in* the film acts with the reducer, ferridcyanide of potash, much better in clearing the transparent places than if a mixture of hypo and ferridcyanide had been used after all hypo had been washed out. The five grains solution of No. 6 can be used as a bath in a white porcelain dish, and the reducing effect watched closely, then removed, and its action immediately stopped by washing. If any part of the negative is found to require local reduction, the No. 6 solution can be applied to the part to be reduced with a tuft of absorbent cotton or large, round camel's-hair brush, and then washed to remove all hypo. If intensification is required, it is best done after the negative has been allowed to dry; but, as time is of the utmost importance in this class of work, intensification can be done now, the only danger being of any hypo remaining in the film, which would cause a yellow stain after being intensified. To avoid this, place in No. 4 for one minute, then wash and place in the mercury solution until whitened, then wash again, and reduce the chlorised image to black, either with a ten per cent. solution of sulphite of soda or the cyanide of silver solution (the latter gives the clearest and most dense deposit), wash for a few minutes, and dry spontaneously; or, if desired to dry quickly, it may be dried in warm air at a temperature of 90 degrees to 100 degrees. Where electric light is used, if the negative is placed before a small electric fan, it will dry very rapidly, as the film of gelatine on these process plates is very compact, and does not swell up to any appreciable extent.

I think I have now explained sufficiently the mode of using the process plates for producing half-tone negatives from which blocks can be made that will furnish prints of the highest quality, and enable those who are tired of the vagaries of the *old* wet method to realise that time, patience, and money are saved by adopting the *new*. For those who do not use a prism to reverse the image (Carbutt's), stripping process plates can be used, and are treated just the same as plain plates. When dry, they are placed on a levelling stand, on three points, brought to a level, the plate covered with a (Carbutt's) stripping medium, using two ounces for 8 × 10 plates, one and a half ounces for 6½ × 8½ plates, three-quarters of an ounce for 5 × 7. In a warm room they will dry in twelve hours, or over night.

JOHN CARBUTT.

SUGGESTIONS FOR IMPROVEMENT OF DEFECTIVE NEGATIVES.*

[American Journal of Photography.]

OF all the photographic manipulations, the most important one is to obtain a satisfactory or perfect negative, consequently it becomes a matter of more or less difficulty.

It is therefore not to be wondered at that almost all photographers are more or less concerned in everything that tends to improve or simplify this important process. How this matter is appreciated by the scientist and manufacturer may be judged from the continual seeking after new and improved developing agents, the promulgation of formulæ, and the advertisements of new varieties of dry plates and films.

Notwithstanding that so much has been already accomplished in this department, and is known and understood, it still remains a fact that many of the simple methods by which a defective or inharmonious negative can be improved and made available are not used to the extent they should be, on account of not being sufficiently known.

Now and then recourse is taken by the every-day worker to improve a negative by intensification, whether the proper thing to do or not, while others again look to the retoucher, no matter how good or incompetent he may be, to harmonise the existing defects.

Now as no one remedy will answer for every defect, it is proposed here to exemplify and explain, separately and in a practical manner, the various known processes for the improvement of a defective or unsatisfactory negative.

The most frequent defect in a negative consists of a veil or fog. This is usually caused by the use of too highly sensitive plates, together with extra light strong objectives, but it may also result from many other causes.

The above defect is divided into two classes, viz., plain fog and coloured fog.

Both varieties can be entirely removed, provided the proper methods are employed, which are different according to the kind of fog.

An ordinary fog, which certain makes of plates seem to be subject to, may be removed expeditiously and with certainty by the application of any slow-acting reducing medium, one of the best of which is the simple acid-fixing bath.

Sulphuric acid	1 drachm.
Hyposulphite of sodium	16 ounces.
Sulphite of sodium	2 „
Chrome alum	¾ ounce.
Warm water	64 ounces.

Dissolve the hyposulphite in forty-eight ounces of water, the sulphite of soda in six ounces of water, mix the sulphuric acid with two ounces of water, and pour slowly into the sulphite sodium solution, and add to the hyposulphite, then dissolve the chrome alum in eight ounces of water and add to the bulk of the solution, and the bath is ready.

Immerse the fogged negative in this bath, and allow it to act until the requisite clearness in the shadows is reached.

Of the numerous existing formulæ for the reduction of negatives, none offers the advantages for clearing fog and gives the results equal to what is known as Belitski's permanent green reducer; this is made as follows:—

Water	7 ounces.
Potassium ferric oxalate	2½ drachms.

When this is dissolved, add :—

Crystallised neutral sulphite of sodium	2 drachms.
Oxalic acid	40 grains.
Hyposulphite of soda	1½ ounces.

This even-acting reducer must be kept in corked bottles in the dark, as under the influence of light the ferric salt is reduced to ferrous. This solution may be used repeatedly, as, if care is taken, it keeps a long time.

Green, yellow, or red fog, however, are not to be removed by reduction, as they are caused by a peculiar condition of the reduced silver. It is, therefore, recommended to change the latter once again into a silver bromide, and then by suitable development obtain the desired grey-black argentic reduction, with corresponding clearness in the shadows. The

* Translated and amplified by J. F. Sachse from the *Deutsche Photographen-Zeitung*.

procedure to obtain these results is a simple one, and the results are sure in *almost* every instance.

When we say *almost*, it must be taken into consideration that any discolouration arising from the oxidation of the developing agent will not yield to the above method, but must be treated by a method of its own.

To overcome the first defects, viz., green, yellow, or red fog, it is suggested to first place the dry negative in water for about ten minutes, so as to thoroughly soften the film, then place in a solution of—

Water	3½ ounces.
Bromide of soda	75 grains.
Bromine	45 ,,

This mixture is to be thoroughly mixed by shaking in a well-corked bottle. Place the negative in a tray, and then pour the solution over it; this must be done in the open air, as strong, noxious fumes are generated.

In this bath the negative bleaches out completely, and appears on the reverse as a positive. It is then to be well washed, after which it is to be redeveloped with a fresh solution of any developing formula. This can be done by daylight. According to the German writer, hydroquinone gives the best result for the final operation. The development is to be continued until the plate appears black, and by transmitted light appears grey-black. Reddish or brown tones are transitory only, and are not to be taken into account, as they disappear with continued development.

The time of development is of no moment, as it has no detrimental effect whatever, the only aim being to obtain the desired grey-black tone with the requisite clearness in the shadows.

When the redevelopment is complete, the negative should be washed for about two hours. It is to be noted that some brands of plates show a tendency, after being put through this treatment, to frill, or even peel off the glass; this is to be overcome by placing the negative in an alum bath for two minutes prior to the final washing. More certain results are, however, to be obtained by the use of a weak solution of chrome alum.

Ordinary yellow fog yields easily to treatment with a thiosinamine solution, which has less objectionable features than the above:—

Thiosinamine	5 drachms.
Citric acid	2½ ,,
Water	1 quart.

The negative is merely placed in the above until cleared; the result is permanent.

When the yellow discolouration is the result of oxydation of the developing agent the best procedure is that indicated by Dr. Liesegang. If resulting from the use of para-amido-phenol, immerse and bleach in a solution of oxalic acid, then expose the plate for two hours to bright sunlight without any previous washing.

Pyro stains may be easily removed with a solution of citrate of tin (*citronen saurem Zinn*), less thoroughly with a solution of sulphite of sodium.

Amidol fog can only be partially removed by the use of either of the two above solutions.

As the stannic salts are apt to act upon the gelatine film, it is best under all circumstances to avoid their use, and take recourse to other methods, even if not quite so effective, such as placing a blue glass in front of the negative in the printing frame, as the resulting green light will give better prints than can be obtained by printing merely through the yellow film.

We now come to another class of defect, such as a negative where, while there is no lack of detail, yet the high lights are too dense. Many are the suggestions that have been made to overcome this difficulty; the following have been tried and found practical.

The well-washed negative is to be treated either with the above bromising solution, or one of—

Hydrochloric acid	8 drops.
Bichromate of potash	30 grains.
Alum	15 ,,
Water	1 ounce.

With this solution a silver chloride is formed, which is not so apt to give sure results. As a substitute for the bromising solution previously given, the following formula has been suggested, as it does not evolve any noxious fumes:—

Bromide of potassium	1 drachm.
Bichromate of potash	30 grains.
Water	6 ounces.

The thoroughly bleached negative is to be slightly washed and then redeveloped with a good hydroquinone developer:—

A.

Hydroquinone	1 drachm.
Sulphite of sodium	4 drachms.
Acetic acid	1½ ,,
Water	5 ounces.

B.

Carbonate of potassium	2 drachms.
Water	2½ ounces.

For use two parts of A to one part of B.

The development is to be carried on only until the details in the shadows and half-tones are well brought out, while the high lights still appear light on the glass side, but by transmitted light show an harmonious density.

The negative is then to be washed for a short time and fixed in an ordinary fixing bath. By this method, either a soft or plucky negative can be obtained.

Another method recommended for harmonising under-exposed and hard negatives, and which has given good results, is one based upon the special properties of stained gelatine. The negative, after being dried, is placed in a weak aqueous solution of some blue-green pigment. The gelatine absorbs the colour in the same proportion as the silver has been reduced in the film. Consequently there is no absorption whatever in the highest lights, as most all the silver there is reduced, while in the clear shadows, where there has been little or no reduction, the colour is absorbed and the shadows are then lightened up and the contrasts lessened in the prints.

This process, with a slight modification, can be made available for the improvement of weak or thin negatives, viz.:—

Water	8 ounces.
Bichromate of potassium	2 drachms.

The negative is placed in this solution for four or five minutes, and is then taken out and dried (in the dark). When thoroughly dry, it is placed film side down on a piece of black cloth or paper and exposed to the daylight from 10 to 15 minutes according to circumstances.

Here the transparent places or shadows are influenced in such manner that the gelatine becomes insoluble, while the half-tones become so only in proportion to their density, and the high lights are not acted upon. The negative is now to be well washed and placed in a solution of India ink and water. Such parts as are not affected, *i.e.*, where there was a somewhat heavy deposit of silver, absorb the inky solution, while the partly illuminated tones absorb the tint proportionally, the deep shadows remaining as they were. When dry the pigment remains in the film as absorbed, and the intensification is a graduated one.

A general intensification of a negative can be accomplished by various methods. The mercurial intensifier, however, remains the most practical one for general purposes.

In cases where intensification is desirable, that will admit the smallest quantity of actinic rays, and where no penciling is contemplated, subjects as landscapes, architecture or interiors, a uranium intensifier has proved of greatest service. The advantages are that any existing fog in the negative is not aggravated, and then that it offers the possibility of reducing or of entirely removing the intensification at will. The solution is made as follows:—

A.

Water	3½ ounces.
Uranium nitrate	15 grains.

B.

Water	3½ ounces.
Red prussiate of potash	15 grains.

C.

Glacial acetic acid.

For use, take A, 2 ounces; B, 2 ounces; C, 3 drachms.

As soon as the turbid mixture becomes clear, the dampened plate, which must have been well washed, is placed in the tray until the negative assumes an intense red-brown tone. It is then to be washed, only until the water ceases to run off in streaks. Prolonged washing reduces the intensification.

Partial intensification or reduction of a negative in many cases is practical, and an operation to be recommended. It is one which apparently is practised by but few operators. The process is so easy and requires so little preparation that it can be characterized as a chemical *retouché*.

The plate to be operated upon must first be moistened, not saturated, with water; it must then be placed in a horizontal position on two carriers—dry-plate boxes will answer—so that it will rest about three inches above the table, on which, beneath the plate, a piece of white cardboard or a mirror is placed, so that the action of the solution may be observed, and the effect checked as soon as the desired point has been reached.

A basin and glass of clean water should be within reach, together with some camel's-hair brushes, and the solutions in small wide-mouthed bottles. The latter should contain the usual bichloride solution for in-

tensification, and several others with solutions of red prussiate of potash of various strengths, varying from 1 : 15 to a concentrated one ; also one of hyposulphite of soda, 1 : 15.

When single portions are to be reduced, take a pencil, dip it in the weakest solution, and go carefully over the dense spot, at the same time take another pencil, dip it in the clear water, and go over the contour or edges of the place to be reduced, the process obviates sharp edges. If the weak solution does not act energetically enough, try the next stronger, and so on, observing the same conditions.

As soon as the desired effect is reached, quickly place the negative in the dish of water. To overcome any sharply defined contours, the water brush must be used. Should, however, sharp lines appear, they can be easily blended with a fine pencil, using a strong solution. To prevent the spreading of the reducing solution, the plate should be partly dry.

To intensify local portions of a negative, it is only necessary to apply to the spot the bichloride solution with a fine brush or pencil until the bleaching process has proceeded far enough. The plate is then laid in water for a short time, after which it is held over a bottle of strong ammonia, the fumes of which soon blacken the spot. Where larger surfaces are involved, a solution of sulphite of sodium may be used.

Where large surfaces are to be reduced, the potassium-ferric-oxalate reducer can be applied and blended with a brush and water.

Other methods for reduction can also be applied, as the shorter processes here given are subject to modification.

There is a word of caution, however, that is not to be forgotten, that all chemicals enumerated in these formulæ are poisonous, and too great care cannot be taken in their use.

In conclusion, we will now treat of a condition that sometimes happens to an otherwise perfect negative, namely, the breaking of the glass.

Broken negatives are easily restored, provided the film is intact. All that is necessary is to lay the broken negative, film side down, on a sheet of glass and warm it, then pour some Canada balsam on the broken negative so that some of that medium will flow into the cracks. Have another sheet of glass warm and in readiness, of exact size of the broken one, flow this with balsam and quickly place it on top of the broken negative, and press well down, so that any excess will ooze out at the sides ; now lift from the bottom support and set away to dry. If carefully done, the negative will be as good as ever. J. Von Norath.

THE CAMERA IN THE EAST.

[Photographic Record.]

The Suez Canal is about 100 miles long, and the average time occupied in going through is from eighteen to twenty-four hours. We pass on our way all sorts, shapes, and sizes of craft, a few of which are here depicted. The last shows one which we passed at very close quarters. Here and there on the banks of the canal stations are built for the purpose of signalling to the vessels which are passing through as to whether the course is clear or not, &c. Near one of these stations, Kantara, a dredger was being emptied of its contents by means of this bridge-shaped piece of mechanism, the mud and dirt being deposited on the other side of the canal bank. At Kantara the canal intersects the camel track in the desert between Egypt and Syria. As we continue our journey, we occasionally catch sight of a camel caravan, one of which I have the pleasure of showing you, the figure on the right representing the leader probably of some little village like El Guisr, which has sprung up like an oasis in the desert, which stretches on either side of the canal for hundreds and hundreds of miles. Even the Suez Canal is not free from beggars, and here is a view of one who was apparently a walking rag shop, his clothes were so tattered and torn, and who kept pace with the steamer for a mile or two, the passengers amusing themselves by shying oranges at him containing pennies. There are other travellers in the great desert besides camel caravans, and here you see a group—a man in front and a woman driving a donkey, and who seem to be making their way slowly and with great difficulty, owing to the loose sand—from Suez to Port Said.

At one of the stations in the canal an Egyptian fruitseller attached his boat to the steamer, and was towed alongside, whilst we passengers made purchases from him of oranges, Turkish delight, dates, &c. The slide now before you depicts him as seen from the deck of the *Massilia*, looking down over the bulwarks.

First passing Ismalia on Lake Timsah, in due time we arrive at Suez, which is at the south end of the canal, and looking back you see Monsieur de Lesseps' house, which is at the entrance to the canal at the Suez end.

Passing along the Gulf of Suez, we are soon in the Red Sea, where, I regret to say, one of our lady passengers died. She was a young lady from Liverpool, going to Australia for the benefit of her health ; but, alas ! the voyage had been too long delayed, and unfortunately she died one evening, being buried at sea early the following morning. A coffin was made of rough boards, weighted with old fire bars from the boiler-room, and at seven o'clock in the morning the burial service was read by the captain, after which the coffin (which had been covered by the Union Jack) was shot out of one of the port holes from a grating into the sea ; and here you have a view of it before it plunged into the water to find its final resting-place. This sad event cast a gloom over the whole ship, and it took some days before it was dispelled.

As all of you are aware, the Red Sea is mentioned in the Bible as being where Moses stretched out his hand, causing its waters to be divided so that the children of Israel could pass safely to the other side. The Egyptians, with all the horses and chariots of Pharaoh, pursued them, but their pursuit was in vain, because Moses, when safe on the other side, again stretched out his hand, this time causing the waters to return and overwhelm the Egyptians, not one of whom remained. Ladies and gentlemen, the Red Sea varies in width from eighty to 220 miles, so whether you believe the Biblical story or not, I'm sure you will believe my story, which is, that as we passed through the Red Sea our vessel had great difficulty in dodging the floating chariot wheels of Pharaoh's hosts which had been washed up from the bottom of the sea.

Just prior to arriving at Aden, the Indian and Burmese mail bags are hauled up from the hold and stacked on deck ready for transhipment there, and here you have a view of how this is done. A large sling is lowered into the hold, the mail bags are put in it, and as they are piled on deck the officer in the centre marks them on the list which you see in his hand.

We leave the Red Sea and all its miseries entailed by the heat and almost unbearable atmosphere, entering the Gulf of Aden through the Straits of Bab-el-Mandeb, only about one mile wide—another name being given to them, "The Gates of Hell." They are so called from the hot, suffocating winds and the intense heat which are experienced in the Red Sea, the continuous direction of these winds being north and south towards the centre. Sometimes vessels when travelling with the wind turn round and steam back for an hour or so in order to give the passengers some little relief from their sufferings. We soon come in sight of Aden, a view of which is before you.

Aden is an English possession in Arabia. It is totally barren, not a single tree existing in the district. There is no water to be found, and it only rains occasionally—the last time being more than two years previous to my visit. I have learnt from a friend who visited Aden a year later that no rain had fallen in the mean time, so you see that for over three years they have had no rain there. There's a rare opening here for an umbrella and macintosh factory. The water which is used and supplied to steamers is obtained from sea water by evaporation and consequently is the purest that can be obtained. Speaking of its barrenness reminds me of a chat I had with the chief officer on the *Massilia*, during which he told me that, if any one, either white or black, is discovered leaning against any tree at Aden, he is immediately punished very severely. I naturally asked "Why?" when he answered, "Because there ain't any."

At Aden, another view of which is before you, I joined the R.M.S. *Peninsular*, transhipping from the *Massilia* with the Indian mail bags. Here you see a number of cargo barges returning to Aden after having helped to do the transhipping. I might mention that one load of one of these barges consisted solely of ingots of silver which were going forward to some of the banks in India. We will also go ashore and have a nearer inspection of the place and its street life. On our way thither we pass a negro fisherman in his boat, as well as a battery of English guns.

On landing and looking towards the east we get a view of some barracks, whilst the next picture shows some of the beasts of burden—camels, donkeys, and bullocks with their drivers—as does also this slide. The next view is one of Sheikh Ahmed's tomb, and shows the only bit of foliage to be found in the place.

My friend, Mr. William Lunt, who was sent with Mr. Theodore Bent's Hadramaut Expedition in Arabia by the Kew authorities to make a collection of the flora of the country, and who, having some spare time at Aden, explored the valleys lying between the hills I have shown you, and found a few stunted plants, but he assured me that none were to be found on the Aden side of the hills, so, as I said before, the foliage you see before you is the only bit to be found in the place. I have a short story to tell you here.

Once upon a time (you know all stories begin this way) there was a certain Sheikh Ahmed, who was the keeper of a "wely" or shrine, supposed by the natives to be the tomb of an eminent saint, and so much frequented by them that the Sheikh grew rich from their costly offerings. His servant Ali, who received only a very small share of the profits, grew dissatisfied and ran away, taking with him his master's donkey. The animal, however, died on the way, and Ali, after covering its body with a heap of stones and sand, sat down in despair. A native who was passing by asked the cause of his grief, when Ali, struck with a bright idea, told him that he had just found the tomb of a great saint—the man thereupon kissed the stones, gave Ali a present, and passed on his way. The news of this holy shrine spread throughout the land, and pilgrims thronged to visit it. Ali became rich, built a fine "kubbeh," or dome, similar to the one you see before you, and was envied by all the other sheikhs. Ali's old master, Ahmed, of course heard of the new shrine, and, finding his own eclipsed by it, made a pilgrimage to it himself, in hopes of finding out the source of its great repute. Finding Ali in charge, he asked in a whisper if he would tell him the name of the saint whose tomb he kept

charge of. Ali said he would, on condition that Ahmed told him the name of his saint, and, on Ahmed consenting, Ali whispered, "God alone is great! this is the tomb of the donkey I stole from you." "Mashallah!" cried Ahmed, "and my 'wely' is the tomb of your donkey's father." I cannot say whether the tomb before you is that of the Sheikh Ahmed mentioned in my story, although it bears the same name; but it may be.

Now we have a view of the manner in which camels are loaded. The camel kneels down, the load is put on its back and made fast, and then the camel rises to its feet. As some of these loads are exceedingly heavy, you can well understand that the camel must have immense strength in its legs to enable it to do this. Walking along, we see on the esplanade some of the shops and cafés, each of the archways representing a separate establishment, and, branching off into the native quarters, we get a very good street scene, in which many nationalities are represented. Aden is noted for its exceedingly clever divers—Somali boys, natives of North Africa—and also for its sharks, and the next few slides will show some of the native boats dug out of the solid tree, as well as the divers with their curly hair (which looks like a bath sponge), who, if a silver coin be thrown in the water, will fetch it up before it has time to sink to the bottom. Some of the older divers will, for a consideration, dive to the bottom of the sea and bring up with them shells or seaweed. They never seem to trouble about the sharks, although one of the divers I saw had only one leg, the other having served for a meal for one of these voracious creatures. Here is a Tasmanian gold digger having a constitutional on deck. He is on his way home after a visit to England. Did time permit, I could tell you many interesting and amusing stories in which he figured.

We will now leave Aden, bidding good-bye to the *Massilia* and the friends we have made on board, crossing the Arabian Sea and the Indian Ocean, but on the voyage I will bring a few persons before your notice. This slide shows two men quoiting, the one on the right being a lieutenant in one of her Majesty's regiments stationed in India, whilst the other is an English produce merchant, whose headquarters are also in India. The latter gentleman came on board at Aden, having been on a shooting trip in Africa. He had had very good sport, having shot six lions and fourteen panthers, besides other large game, and was returning home with the skins and about half a dozen lion cubs, which he had managed to capture alive. You see from this slide that, although I have never had a chance of shooting at lions, such as that famous one Lord Randolph Churchill had, still I have managed to "shoot" a lion-shooter. The next picture shows how part of our time was spent while crossing the Indian Ocean, and is the photograph of an Ashton gentleman who was going out to India to manage some up-country cotton mills.

We are now in Bombay harbour, being over 6800 miles from home. We will bid good-bye to the Peninsular and the sea here, and, after spending some time in sight-seeing, we will proceed on our journey across India towards the rising sun. Before disembarking, however, have a look at this native boat conveying two deck passengers ashore—a merchant and his wife who are returning home to India from a trading trip in Arabia. You see the man in his white turban on the left, the wife being next to him.

We will now go ashore in one of the P. & O. steam launches, getting off at the Apollo Bunder, which is an exceeding fine landing pier at Bombay. In less than two minutes after setting foot on Indian soil I was at work with my camera, and you can well imagine with what interest I shot at this, the first bullock cart I had ever seen.

Before proceeding further, a few words respecting Bombay will, no doubt, prove of interest. It is built on an island, and the invigorating sea breezes to which it is open makes it one of the healthiest places of residence in India for Europeans. Its public buildings are exceedingly fine, and excel in beauty many of those found in European cities. At the same time, one cannot overlook the fact that the aspect of the city, which contains over 800,000 inhabitants, presents a strange mixture—splendid public buildings and palm-thatched hovels, sumptuous bungalows and mud huts, carriages and bullock carts, men with bare feet in well-appointed carriages attended by liveried servants, women flitting about in garments of dazzling brightness, with jewels in their noses, bracelets on their arms and ankles, rings on their toes, other women bending under heavy burdens with scarcely a rag (but always some ornament) to cover their nakedness. The beautifully picturesque manner in which the better-class women dress strikes one forcibly, and although the whole of their costume consists of but one article of attire, viz., a few yards of coloured cotton or silk, yet I must admit that their appearance is prettier and more artistic than that of the European ladies of to-day.

We will now proceed on a sight-seeing expedition in the city and vicinity, but I will only very briefly describe the slides as they appear before us. This gives you an idea of the beauty of the Victoria Railway station at Bori Bunder, the terminus of the Great Indian Peninsular Railway, and, like many other of the principal buildings in Bombay, is built of stone. Here is a Mahommedan school with an exceedingly fine tower surmounted by a beautiful dome, whilst this shows Sheikh Meman Bazaar. On the right you will notice a horse and gharrie or open carriage which has a hood to protect the occupant from the sun. The gharrie wallah or driver seems to be having an animated conversation with the man in the street—look at the attitude of the latter. A very large Mohammedan temple forms the background. We next pay a visit to Abdool Rehman Bazaar. In the centre, some distance down the street, you see the dome of another mosque; and here we have a view in Abdool Rehman Street. In Bhenah Bazaar we pass this Mohammedan mosque; the Parsee in the centre seems to be training for a walking match. This statue of the Empress of India, our Queen, was erected in Mayo-road by the Gaekwar of Baroda, who not long ago paid a visit to this country, and whom I had the pleasure of seeing in Manchester at the time. Next we have a slide showing the Rajabai University Tower, library and public offices, with Malabar Hill on the other side of Back Bay in the distance, as seen from my room in the Esplanade Hotel. The next slide shows the same buildings from another point of view (the racecourse). Now we are in Kolla-street, and you see a row of shops all open to the street, from the largest jewellers to the meanest food stores, the proprietors being squatted somewhere on the floor in the midst of their wares. The shop on the extreme left is a jeweller's, the cases you can just distinguish containing a fine assortment of silver and gold ornaments. Not far away is this statue to Sir Bartle Frere, which is erected near the General Post Office, a view of which I show you, as well as of the Telegraph Office. This is the corner of Girgam-road, and is a typical Indian scene—shops on the ground floor of the buildings, residential rooms above with covered-in balconies, palm trees throwing up their crested heads, of little use for shade from the sun, but useful for the cocoa nuts they bear; bullock waggons, and tramcars with horses wearing solar topeys or hats as protection from the fierce sun. In Bimleshwar-street we have a view of a variety of costumes, and of a lady with bangles round her arms, bracelets round her wrists, a silver hoop round her ankle, and a big hole in her dhootie, showing her hair and dusky skin beneath. On the right are a party of Parsees in a bullock cart, and, judging from the laughter visible on their countenances, I gather they are going on a picnic. The Ripon Club is one confined to Parsees, whilst here you have the British Institute, and there a small Mohammedan mosque, with a bullock cart cantering past. Another temple sacred to the followers of Mahomet. Without asking permission I climbed into a native's shop window, planting my feet here and there among his stock in trade until I got into position for taking this view, whilst the shopkeeper looked on in amazement at what he, doubtless, considered only another prank of a mad Englishman. This is a charpoy or bed made of a few sticks of bamboo held in position by the ropes which are stretched from them and which form the mattress upon which the natives sleep either in their huts or in the streets whichever they choose as being coolest. This shows the Colaba Memorial Church, about two or three miles from Bombay, erected in memory of the men who fell in the first Afghan War—the Jamsetjee Sanitarium, I believe, for invalid soldiers at Colaba.

We will now climb Malabar Hill, the fashionable quarter of Bombay, and looking east from Government House, the residence of the British Governor of the Bombay Presidency, this lovely panorama is spread before us. We should be astonished if we could see men and women (mostly women) paving or macadamising our streets or roads; but here you have such a scene, the woman in the foreground having on her head a coolie basket full of broken metal—the women do the laborious work, whilst the men rake the stones into position on the road. This shows a number of Hindoos thatching a bungalow with palm-leaf matting, the woman in the centre doing all the dirty work, whilst the work generally is superintended by the man in white in the foreground on the left. On our way to Bombay from Malabar Hill we pass along the shore of Back Bay, and here you have a view of some native boats, and in the distance of the promenade facing the sea. Passing along this promenade, which in the evenings, just before sunset, is alive with carriages and foot passengers, the Parsee ladies being arrayed in garments of all the colours of the rainbow, we get a snap-shot at some of the fish and vegetable vendors on the shore who are not so decked out, their garments being simply a very dirty reddish-coloured dhootie—of course, they wear the usual silver ornaments on their arms and legs. You will, no doubt, notice the rather unique situation in which this gentleman carried his—well, say pocket handkerchief. Our next view is of some black buffaloes grazing on the racecourse, and on the back of one you will see a crow is perched. This crow reminds me of the impudence of Indian crows which seem to fear neither man nor beast.

I have seen a crow come and balance itself on the tray of an Indian food seller (which he was holding out in both hands), help itself to what it chose from the tray, the man being unable to do anything at the bird except shout, of which it took no notice, merely cocking its head on one side with a knowing look as much as to say "What do you take me for?" and then, when it had helped itself to what it wanted, it uttered a self-satisfied and derisive "Caw!" and flew away, no doubt to recount to its companions the manner in which it had taken advantage of insignificant man. Crows used to visit my verandah regularly every morning when I was having chota hazin or early breakfast. I have known them, when I have been holding the newspaper between my face and the table, swoop down on the table, scoop up all the butter with their beaks, and fly off with my toast in less time than it took me to drop my paper. If I wanted to enjoy the meal and my paper quietly, I had to station one of my servants on the verandah to drive away these cheeky birds.

Here is a group of Indian women filling their catties or water jars at a public fountain, whilst the one squatted down on the right is busy pounding the curry which she will mix with rice probably for her lord

and master's evening meal. Here we see two men who are having a wash (without soap) at a fountain in one of the principal streets of the city. This is a back view of four very fine Indian fishermen who are wending their way homewards after their day's toil is done.

We will leave Bombay, and continue our journey through the heart of the country to Calcutta, a distance of 1400 miles. It is not my intention to-night, however, to show you more than about half-a-dozen views of the country you pass through on this trip, as the journey in itself is quite sufficient for a separate lecture.

At Parel there are a large number of workshops and cotton mills where the hands work from light to dark, about fourteen hours, with one break of about an hour in the middle of the day. Here, I obtained a snap-shot of a magnificent pair of horned buffaloes harnessed to a very well-made cart, as well as of a very fine native residence—the design of the woodwork, you will notice, is very pretty. The next slide at Tauna, where an old Portuguese fort serves as the gaol, is interesting on account of the figures therein depicted. The one on the extreme left shows an old married lady, near to her stands a widow, and, if you could get close enough to examine her, you would find that all her hair has been cut off and her head shaved; the next is a young married woman, whilst close to her is an unmarried (but probably engaged) girl, the one bent down being a child, too young to be either engaged or married, which sometimes takes place at the age of six years. Scattered round about them on the ground you see their luggage, which possibly represents all they possess. This shows you a peculiar thatched native dwelling, where many families jointly reside at Wassind with a background of the Ghauts. The ascent of the Thull Ghaut begins here, and I might explain that the Ghauts are a conglomeration of mountains some fifty miles from Bombay, which the railway is built over.

J. W. Hadfield.

BROWN *VERSUS* LANCASTER.

At the Whitechapel County Court on the 8th inst., before his Honour Judge Bacon, J. Brown, a photographic operator, sued Stuart Lancaster, a photographer, carrying on business in the Mile End-road as Art photographer to the Queen, for 3*s*., balance of a week's wages, 30*s*. in lieu of a week's notice, and 20*l*. damages for assault. Mr. Rose-Innes, barrister, instructed by Mr. George Fall, appeared for the plaintiff. The defendant conducted his own case.

From the opening statement of counsel and the plaintiff's evidence it appeared that, in April last, the plaintiff, seeing an advertisement in The British Journal of Photography for an operator at 12*s*. per week and board and lodging, called on the defendant at his place of business. The defendant expressed himself satisfied with the testimonials shown, but no engagement was made. On the evening of the next day (Saturday), however, the plaintiff received a telegram from the defendant to come at once. He went on the following morning (Sunday), when Mr. Lancaster said he would give him a day's trial. At the end of the day defendant expressed himself satisfied with his work, and engaged him to continue. He was left in charge of the studio during the whole of the ensuing week, and did all that there was to do, but the apparatus and appointments were deficient and not suitable for turning out first-class work. He did not sleep on the premises, but had to get a bed out, Mrs. Lancaster telling him that the bedroom was not ready. The food given him was insufficient, both in quantity and quality. For dinner he had a few cold potatoes and about an ounce and a half of meat, for tea one slice of bread and margarine and a cup of tea. On the Thursday or Friday he received from Mrs. Lancaster 1*s*. 6*d*., and on Saturday she gave him 7*s*. 6*d*., at the same time telling him that, as things had been very quiet during the week, she had no more money, but he should get the balance from Mr. Lancaster on Monday. On Monday morning he was at the studio at the usual hour for commencing business, but Mr. Lancaster had gone out. He waited about all day, calling five or six times, but was unable to see the defendant until about seven o'clock, when Mr. Lancaster came in with two friends. Addressing the plaintiff, he asked him what he wanted. Plaintiff replied he wanted to be paid the remainder of his wages. Defendant said he would soon pay him, and, seizing him by the collar, threw him down and fell upon him. Plaintiff was much hurt, his neck was scratched and bleeding, and his nose also bled. He then went to the police station and made a report of what had occurred. In cross-examination he admitted that he had not complained of the quality of the food offered him, nor asked for more. He denied that he agreed to take 10*s*. per week as he could not retouch.

The defendant's statement was that he was not satisfied with the plaintiff on the Sunday's trial; but, as he had no one else to take charge of the studio, he engaged him for the week at 10*s*. per week. He had been paid 15*s*. 6*d*. in all—2*s*. on Monday night, 1*s*. 6*d*. each on Tuesday, Wednesday, Thursday, and Friday night, and 7*s*. 6*d*. on Saturday. On the Monday evening, when the alleged assault took place, the defendant returned home with a friend about nine o'clock, and found the plaintiff occupying the chair usually used by Mrs. Lancaster. He told the plaintiff, in reply to his demand for money, that if he had any lien upon him he could take his remedy in the proper place. As plaintiff would not leave the chair, he placed his hand on the back of it, when plaintiff sprung up and rushed at him. In cross-examination, he denied that he was the aggressor and that the struggle was a violent one, as described by plaintiff.

Police constable Ryly stated that the plaintiff made a complaint to him on the night in question, and that at the time he had scratches on the neck, and there were signs of bleeding at the nose.

Mrs. Lancaster said she paid the plaintiff 1*s*. 6*d*. on each evening in the week except Monday, when he had 2*s*. She paid him 7*s*. 6*d*. on Saturday, but it was not true she said she had no more money. Plaintiff asked for more money, and she told him he must ask Mr. Lancaster about it. On the Monday plaintiff was rude and abusive, and used bad language.

Manuel Josephs said he lodged in the defendant's house. On the evening of the alleged assault he returned home with Mr. Lancaster. They found the plaintiff in the room. Defendant told plaintiff, in reply to his demand for money, that if he wanted any more than he had received he had a remedy. He corroborated defendant's account of the tussle.

Mr. Rose-Innes, in addressing the jury, said that this was a case in which, from its nature, it was impossible for the plaintiff to bring witnesses in support of his story, while those on the other side might, from the situation, be reasonably suspected of being prejudiced. The evidence of a wife for or against her husband could not be given in a criminal case, for the reason that such evidence must, from the relationship of the parties, necessarily be tainted. He asked them, therefore, in considering the respective accounts of the plaintiff and of the defendant and his witnesses, to weigh carefully the probability of truth. Did it seem probable that the plaintiff in the defendant's own house, and in the presence of three persons, all naturally, from the position of affairs, against him, and two of them physically his superiors—was it likely that, under these circumstances, the plaintiff was the aggressor? Was not the plaintiff's story more likely to be a reasonable account of what took place?

His Honour, in summing up, said the questions the jury had to consider were: Was the amount of salary agreed upon 12*s*. per week or 10*s*. per week? Had the amount agreed upon been paid together with a reasonable sum in lieu of providing a bed? And had the defendant used unnecessary violence to the plaintiff; and, if so, what amount of damages was he entitled to? Almost the only occasion on which an individual was permitted to take the law into his own hands and use physical force to another was in the case of an intruder into his own house. Any one had a right to remove any person from his own house if he objected to his presence, even though the purpose in being there was a perfectly lawful one, and, if necessary, a sufficient, but not an unnecessary, amount of violence might be used.

The jury found for the defendant.

A NEW "SPORT."

[Daily Chronicle.]

The invention of a new sport would seem to approach the bounds of the impossible. The number of people who desire to amuse, to excite and to exercise themselves is so great, and so large a proportion of them are so well furnished with both money and pluck, that the habitable world, from the reeking jungles of India to the frozen fastnesses of the Arctic region, has been thoroughly ransacked. Yet in this case, once more, a Faust has appeared to accomplish the inconceivable. An American gentleman, rejoicing in the name of Wallihan, has invented a most fascinating pastime, in which two parts are played by a man on one side, and a grizzly bear, a mountain lion, or a rattlesnake on the other. When such opposed personalities generally meet, the third feature of the meeting is a rifle. In Mr. Wallihan's case it is a camera, no box slung over the shoulder by a strap, or tucked into a big pocket, to be hastily snapped and flung aside, but a real old-fashioned bellows camera erected upon a solid tripod. In fact, Mr. Wallihan, who has apparently been a successful hunter for many years, now takes his pleasure in the gentler, if equally dangerous, sport of photographing his prey.

"In the future," says the editor of the *Cosmopolitan*—the admirable and enterprising American magazine from which we take these facts—"the literary hunter will tell you of his emotions while arranging his camera, how he felt as he looked into the eyes of the advancing animal, measured the angle of the sun, calculated the shades and shadows, and prospected the chances of a good negative." Once already an enterprising American from Philadelphia attempted this new sport in India. At the risk of his life he obtained photographs of the tiger about to spring, and of the charging elephant. On his return, he sent his camera (*sic*) to the photographer for development. A week later he received a polite note, informing him that in removing the films they had been exposed to the light, by the carelessness of an employee, and all spoiled. We could parallel this experience by the fate of some negatives of the interior of Korea, nearer home. Warned by this example, Mr. Wallihan develops his own plates as he goes on. He began by proceeding to a well-known antelope ground, and concealing himself behind a "blind." After a while he was greatly favoured, for the beautiful creatures suddenly appeared over the edge, and positively came and watched his shutter snap. We have never seen more charming pictures of these animals than those he has secured.

Soon, however, he longed for more difficult game, and proceeded after the mountain lion—a species of enormous wild cat which prowls about the Rocky Mountains. This he chased with dogs, until it was "treed" or brought to bay, and then he set up his camera, plunged his head under the black cloth, adjusted his shutter, and withdrew his slide—to find, of course, that in the mean time the wily beast had escaped to another point. "In every case," he modestly says, "a great deal of patience was required, and often there was no little danger involved." His final success is shown by three delightful pictures. There is a mountain lion crouching on a huge log, staring with all its eyes, and every muscle taut for a spring. There is another curled up in a tree, throwing a diabolical glance over its shoulder; and in a third photograph a splendid beast stands bolt upright in a tree, as magnificently posed as if it desired to go down to posterity as an ideal of its race. After the lions came the bears, and here they are, sure enough, walking about on their flat paws and sniffing with outstretched snout, while the light plays on the soft curves of their furry coats. The huge-headed bisons are here also, but they must be tame ones, as the wild ones have long been exterminated. The white sheep of the Rockies, and the big-horns, so hard to shoot, fell victims to Mr. Wallihan's camera. The shy-prairie-dog colony seems going about its usual business unconcerned. The beavers, with their bright little eyes and spade tails, are intently working on their dam of sticks and mud, and, perhaps most thrilling of all, from one picture the rattlesnake glares viciously at us as he stiffens his coils for a wicked spring. And, finally, here is Mr. Wallihan himself, a quaint-looking gentleman with a very long beard, a wide-awake hat and spectacles, standing proudly beside his deadly camera, grasping the rubber bulb of his pneumatic shutter as if it were some deadly weapon. We congratulate him on his plucky and charming sport, and we trust he may never have occasion to regret the absence of his rifle.

Our Editorial Table.

The "Venus" Combined Toning and Fixing Bath.

Milne & Co., Ramsden-road, Balham, S.W.

Messrs. Milne & Co. have sent us for trial a bottle of their "Venus No. 2" combined toning and fixing bath. This they state to be a metallic, and not a sulphur, toner, and it is also, we understand, available for use with the various matt and glossy printing-out surface papers. The following instructions indicate how sepia and brown colours may be secured:—

"*Printing.*—To obtain sepia and brown colours, print to the ordinary depth.

"Immerse prints face downwards in the No. 2 bath without previous washing. They will at first assume a yellowish colour, but rapidly change to reddish brown and from that to sepia brown, gradually getting a darker colour. Tone until the whites are clear, and no further. Over-toning produces yellow whites. From three to four minutes is the average time to complete the operation of fixing and toning. When the desired tone is obtained, immediately remove prints to a vessel of running water; this stops all further action.

"*Washing.*—Should be for at least from two to four hours in running water."

Following the instructions here given, we succeeded in obtaining an extremely agreeable brown tone in our prints. The solution acts with great rapidity, and the "Venus" toner should be found a useful adjunct in the laboratories of those who employ combined baths. Black tones are got by the use of another solution (No. 1), which Messrs. Milne supply, and the baths can also be used for lantern plates and transparencies. Specimen prints shown us prove that a remarkable range of good colours may be secured with the "Venus" toning solutions.

The Britannia Works Company's New Plates and Films.

Ever ready and quick to minister to popular photographic requirements, the Britannia Works Company have recently put on the market several new varieties of plates, films, and papers, for which we have no hesitation in predicting a prominent place in general esteem.

The Empress Plate.

This is a plate said to be about twice as fast as the Ilford ordinary plate of the same makers. So it proved, in our hands to be, while otherwise, with pyro-soda development it yielded negatives with which no technical fault could possibly be found.

The Ilford Special Plates.

These are said to be about four times as fast as the Ilford ordinary. We have certainly not met with a more rapid plate, and we can confidently recommend it where the extreme of sensitiveness is required. The makers are to be congratulated on having that old reliable friend of the public, the Ilford ordinary, to work from as their standard plate. The comparative rapidities above specified came out in actual practice as nearly correct as the most rabid Hurter & Driffieldite could desire.

The Ilford Films.

Cut films have always had a good word from us, and, now that the Britannia Company are putting such on the market, we may fairly look for an increased use of them. The samples sent us were coated with "Empress" emulsion, and answered admirably in use. They are beautifully flat, and can be placed in the dark slide simply backed up with cardboard.

La Phototypogravure À Demi-teintes.

By Julius Verfasser. Paris: Gauthier-Villars.

This is a translation from the English, by M. E. Cousin, of Verfasser's book on *Half-tone Etching on Zinc and Copper*. The illustrations depict the apparatus necessary with the work, and the book, which is concise and practical, will, no doubt, be appreciated on the other side of the Channel.

Dictionnaire Synonymique des Mots Techniques et Scientifiques employés en Photographie.

By A. Guerronnan. Paris: Gauthier-Villars et Fils.

This is a book in which the principal terms, names, and expressions ordinarily enployed in speaking or writing of photography are rendered in French, German, English, Italian, and Latin. The work has been well carried out, although the English portion of the compilation would not have suffered had it had the benefit of slight revision and correction at English hands.

Wratten's Anti-Halation Backing Pads.

Wratten & Wainwright, 38, Great Queen-street, W.C.

These adhesive backing pads which Messrs. Wratten & Wainwright are supplying will be found handy and efficient substitutes for prepared backing mixtures, which, in our observation, many photographers, especially amateurs, do not care to use. The pads are coated with an ever-moist adhesive, and are easily pressed into perfect contact with the back surfaces of the plates. When not in use, they are protected by pieces of linen from getting into contact with other substances, and will thus last for a great length of time. A supply of these adhesive pads, which are very cheap, will soon pay for themselves in minimising halation, a defect from which few landscape or interior negatives are free unless means are taken to avoid it.

Art Photography.

By H. R. Robinson. London: Hazell, Watson, & Viney, Ltd.

Mr. Robinson possesses the threefold quality of being at home in his knowledge of photography, of art, and of facility in the expression of his ideas; therefore any utterance of his on art photography is bound to receive that attention which is demanded by his ability and experience, intensified by the success with which his previous writings on cognate topics have been universally received.

This is not a large volume—in reality, it contains only sixty pages—but it contains in one page often as much as is spun out to fill a volume, for the style is compressed rather than diffused. The titles of the chapters afford a capital idea of the topics treated, which embrace Nature and Art; the Application of Composition; Terms used in Art; the Sky; Figures in Landscape; Combination Printing, &c., each forming a practical essay complete in itself. By way of an "appetiser" we subjoin an extract from the introductory chapter:—

"As the science of photography has its formulæ, so has the art of picture-making, in whatever material, its rules. It is not enough to know that a scene is beautiful; the question for the artist is, Will it make a picture? To see this requires a special training. Acute and instant sensitiveness to its 'points' is necessary.

"It has been objected that, when art is reduced to words, truth evaporates. I admit that analysis abolishes sentiment, but these chapters are only intended to teach how to erect the scaffolding by means of which pictorial sentiment is built up; and how is it possible to teach without some settled rules or formulæ? Rules are only intended as a sort of shorthand to arrangement, and are made to be broken when necessary.

"It is sometimes said that I never go beyond the structure of a picture in my endeavours to teach art; in fact, that I do not teach art at all. This is quite true, notwithstanding the title of these chapters. I en-

deavour only to teach the means by which art is produced. It would be presumption in me to try to go further. I have never felt that the poetry of art could be taught, and, if it could, there seems to be a sort of desecration in analysing the feeling for the beautiful. It is easy to talk of awe-inspiring mysteries; it would not be difficult to write volumes of rapturous language—it is done every day; but what do they mean? I know that, beyond composition and chiaroscuro, which can be taught, there is much which cannot be conveyed in words. That is what an old friend, snapping his fingers, used to call 'that.' 'That' is too seldom seen in a photograph, or, indeed, in a painting. 'That' is the poetry, the thought, the feeling, the sentiment, the something that sends a thrill of pleasure through you—the touch of art, the indescribable essence. 'That' is something that can be seen and felt, but which evaporates at the approach of the descriptive word. 'That' it is which must be born in a man, or come to him, for it cannot be taught. 'That' can be cultivated and improved, but not created.

"The artist who wishes to produce pictures by the aid of a camera is governed by the same laws that guide those who use paint and pencil, with, however, this difference, the photographer finds his materials less plastic than those of the painter, his scope more limited. His aim, therefore, should correspond with his possibilities. For, like every other occupation, be it art, science, or mystery, we must admit that photography, as applied to art, has its inherent limitations, to overstep which is to pass the bounds of what is sometimes called good taste. Wonderful as the science is, far-reaching as is its scope, there are things it cannot do; it can penetrate the abyss of the sky and reach a star beyond touch of the telescope, but it cannot produce an historical picture. For portraiture it is perfect, for it gives the facts of the man; for landscape it is adequate, as far as black and white is sufficient; and to *genre* it can, to say the least, be adapted—but there are regions of the imagination to which it cannot soar.

"To recognise that he cannot do the impossible will clear away many difficulties for the photographer; to discover that it is well to avoid any approach to the impossible, and judicious to keep clear of the doubtful, will help his artistic progress, while, to make the great discovery which man only arrives at after painful experience, that simplicity is more beautiful than complication, will help to complete his education. He should take care also to avoid any chance of bathos. Attempts at the pathetic, or the sham sentimental, fail more ignominiously in photography than in any other art. A photographer who attempts this kind of subject has the choice of the two horns of a dilemma; either he must get his picture with models, and would be guilty of unreal mockery of a solemn thing, or he must photograph real sufferers, on whose misery it would be indecent to intrude. I have been guilty of the former of these offences, but it was thirty years ago, in the innocent age of the art, before we had learnt to know right from wrong."

From the foregoing extract may readily be deduced the admirable manner in which the artist-author must and does treat the branches of his subject, which we have mentioned.

Introduction to the Practice of Wet-collodion Photography.

By Chas. W. Gamble. London: Hazell, Watson, & Viney, Ltd.

This work is written in the interests of those photographers who are directing their attention to photo-mechanical printing processes, wet collodion being believed by many to be the most suitable means of making negatives for the required purpose. To such it will prove useful, as it contains many useful hints, and also an appendix in which are to be found various tables, &c.

The new catalogue just issued by Messrs. Valentine & Sons, Dundee, is put up in an admirable form for ready reference. The whole series is bound together, and each, as in an alphabetical index, has its special number, seen at a glance on opening the cover, when the key to the whole is found facing the observer. The number of pictures in every part of the world represented by this series of catalogues is truly astonishing.

From Herr Wilhelm Knapp, of Halle-a-S., we have received *Anleitung zur Verarbeitung Photographischer Ruckstände*, by Alex. Lainer. This deals exhaustively with the reduction of gold, silver, and platinum residues. The book forms Vol. XV. of the *Encyclopædia of Photography* in course of publication by Herr Knapp.

The Pocket Guide to Cycling.

By Ernest M. Bowden, B.A. Glasgow: Hay Nisbet & Co.

This little volume consists of a collection of practical hints for followers of the pastime and sport of cycling. The information on the selection and care of a machine, together with the evidently sound advice, which it gives on a large variety of topics connected with the cycle, should make the volume immensely useful to beginners and proficients in the art of cycling. Price 1*s*.

News and Notes.

Messrs. G. Philip & Son, of Fleet-street, write: "We beg to inform you we have just secured the manufacturing rights of Askew's patent portable box for the optical lantern, formerly brought out by Messrs. Newton & Co., also Askew's patent portable lantern, both of which we will place upon the market this coming season."

Hastings.—Photographic visitors to this charming seaside town will find the photographic stores of Mr. Algernon Brooker, 21a, Wellington-street, replete with a large and varied stock of requisites for camera work. Mr. Brooker places three dark rooms at the disposal of his customers, and, being himself a clever and experienced photographer, is well qualified to help and advise beginners and others.

The Aquarium Exhibition Awards.—Class A (1), *Richmond Bridge*, E. Atkinson; (2) *Fishbourne*, E. C. Hertslet. Class B (1), *Nesta*, W. Gill; (2) *Sunshine and Shadow*, G. E. Bennett. Class C (1), *A Stormy Sunset*, E. Dockree. Class D, No awards. Class E (1), *Decline of Day*, J. H. Gear. Class F, Lantern Slides, (1) J. H. Gear; (2) E. Dockree; (3) J. F. Field (for flowers). Class G, Portrait, Mr. Hana, Messrs. Chaffin. Class H (1), *The Ghost Story*, R. Terras; (2) *Behind the Reredos*, J. H. Gear. Class I (1), *Baronial Hall*, E. R. Bull; (2) *Within the Altar Rails*, E. R. Dockree. Society Competition, East London. Special diploma for Photo-mechanical Work, S. B. Bolas & Co.

Death of Mr. T. G. Whaite.—A correspondent writes: "I have just received a notice of the death of Mr. Thomas George Whaite, who died at Riverside, California, U.S.A., July 21, 1895, aged sixty-one years. I thought you might care to insert a notice of his death. If so, the following particulars may be of use. He commenced business in Carlisle nine years ago, and was very successful. Four years ago, however, he emigrated to America, and ultimately settled down to orange-growing in Riverside, California, where he found the climate suited him. Orange-growing proved fairly remunerative, and he always expressed regret that he had not gone there earlier in life. With his earlier career, as assistant with Mayall & Co., you will be more familiar than I am." The late Mr. Whaite was a photographer of long experience, and a man of great ability in his profession.

Messrs. W. W. Rouch & Co.'s New Premises.—The old-established and historical house of Rouch & Co., photographic apparatus makers, dealers, &c., has recently removed from No. 180, Strand, London, to No. 161 in the same thoroughfare, the former premises having to come down to make way for improvements which have long been in progress in this part of the metropolis. The new premises are situated next door to the entrance of King's College, and are exceedingly well adapted for the purposes to which they are applied. The front window in particular is a centre of attraction for the innumerable passers-by of the Strand, being embellished with a choice and high-class selection of apparatus that would be difficult to excel. The elimination of the pharmaceutical department, which was a prominent feature of the old premises, allows of greater scope for the conduct of the photographic business at the new address, a circumstance of which the fullest advantage is taken, with the result that Messrs. Rouch are enabled to make a display of their well-known cameras (hand, stand, and studio), changing backs, complete sets, lenses, dark tents, and innumerable other photographic requisites, to signal advantage in their beautifully fitted *atelier*. The workshops are situated at the top of the building, and a capital dark room is provided for the use of amateurs and others. Altogether the latest departure of this notable firm is a testimonial to its enterprise and an augury for its continued prosperity.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 14,387.—"Improvements in Lenses." Communicated by A. Quentin. A. J. Boult.—*Dated August*, 1895.

No. 14,663.—"Improvements in Stands for supporting Cameras, Theodolities, Levels, Magic Lanterns, and other Analogous Purposes in Frames for Screens, for use with Magic Lanterns and other Analogous Frames, in Easels and in Frameworks for Tents and other Analogous Frameworks." W. Broughton.—*Dated August*, 1895.

No. 14,862.—"Improvements in Camera Slides or Holders for Cut Films." C. P. MacCarthy.—*Dated August*, 1895.

No. 14,943.—"Short's Photographic Changing Box for Plates." M. Short.—*Dated August*, 1895.

No. 15,013.—"An Improvement in the Turntables of Photographic Cameras." E. Gilyard and H. Cousen.—*Dated August*, 1895.

No. 15,093.—"Improved Intensifier, Reducer, and Toner, for Photographic Purposes." A. Hill.—*Dated August*, 1895.

PATENTS COMPLETED.

Improvements in Processes of Making Transparent Photographs on Glass.

(Communicated by Francis Bernhard Forster and George Gardner Rockwood, both of 1440, Broadway, in the City, County, and State of New York, United States of America.)

No. 6501. Charles Arthur Allison, 52, Chancery-lane, London. *February* 10, 1894.

In carrying out this invention, the sensitive medium upon which the photo-

graphic picture is printed from the negative is surfaced with a mixture of gelatine and a metallic oxide, such as oxide of copper, iron, or gold, and this mixture is dried on the medium, which may be glass or paper, in a dark room. This prepared medium is then exposed to light under a photographic negative in the usual manner. When the picture is thus printed on the said medium, the surface of the film bearing the print is coated with collodion. The print is now transferred to a temporary support, such as gelatinised paper, which is accomplished by causing the paper to adhere to the film, and then withdrawing the paper carrying the film with it from the glass. The print on the temporary support is then developed in the usual manner.

The film picture in the metallic oxide is then transferred from the temporary support to the surface of the permanent glass base. This leaves the picture in the metallic oxide on the glass. The collodion is now washed away by a flow of ether, and the picture film is rendered insoluble on the glass by the application of a solution of chrome alum, and the plate is then dried.

The picture film on the glass is then coated with a vitreous flux, which fuses at a lower temperature than the melting point of the glass base, and such a flux may be composed of two hundred (200) parts of yellow oxide of lead, twenty (20) parts of borax, and eighty-nine parts of quartz sand. These materials are pulverised and mixed, and, in a fine powder, are dusted over the film.

The glass plate bearing the film and flux is then subjected, in a suitable kiln, to a degree of heat, say, between six hundred (600) and seven hundred (700) degrees Fahr., to fuse the flux, which acts to vitrify the metallic oxide upon the glass base, and to cover the picture with a transparent, vitreous coating, so that the picture is permanently, unchangeably, and indestructibly affixed to, and in the surface of, the glass base, and is visible by both transmitted and reflected light.

Having now particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, I declare that what I claim is :—The process of making transparent photographic pictures, which consists in printing the positive image, in a metallic oxide, from the negative upon a medium which has been surfaced with a mixture of the materials constituting the sensitive film and said metallic oxide ; then transferring said print, in said metallic oxide, to, and developing it upon, a temporary support ; then transferring said developed print to, and rendering it insoluble upon, the surface of a transparent glass plate ; then coating said print with a vitreous flux of the character stated, and which fuses at about the temperature specified, and subjecting the glass plate, bearing the print and its flux, to a degree of heat to fuse the flux, substantially as set forth.

A Process for Photographing in Colours.

No. 17,758.—Victor Mathieu, 51, Berwick-street, Oxford-street, Middlesex. *July* 15, 1895.

This invention relates to a process by which photographic pictures are produced in colours, more or less corresponding with those of the objects photographed, which may be living objects, such as persons, or inanimate objects, such as landscapes or pictures. For this purpose, several plates are prepared with different films, to be used for taking several negatives of the object, suited for the different colours that are to be reproduced. Usually three such plates are employed—one for reproduction of blue, one for red, and one for yellow.

An image is taken on the plate prepared for blue, light being passed through a bright yellow or orange glass screen. The image is also taken without a screen, or with a green screen, on the paper prepared for red, and it is also taken on the plate prepared for yellow, a light violet screen being employed. These three negatives are developed in the usual way. Instead of using coloured screens in taking these negatives, the films may be suitably coloured as hereinafter described.

Coloured gelatine solutions are prepared, one coloured blue, another coloured red, and a third coloured yellow. With these solutions three gelatine films are prepared, sensitised, and photographically printed from their respective negatives, and the proofs are suitably developed. One of the three gelatine films is then transferred to paper coated with gelatine, another is placed in register on it, and the third is placed in register on the second, there being thus three coloured images superposed on the paper, the whole forming a coloured picture which can be glazed and mounted in the usual way. Instead of gelatine, albumen, collodion, or other suitable substances giving transparent films, may be employed.

Such being generally the nature of the process, I shall now describe the particular substances, proportions, and methods of operating for producing coloured photographs. A film for the negative plate to reproduce blue is prepared as follows :—In a dark room, in one vessel, 10 grammes silver nitrate are dissolved in 100 grammes of distilled water. In another vessel 8 grammes potassium bromide are dissolved in 100 grammes of distilled water, and ¼ gramme of eosine is added. Both solutions are slightly heated, and the former is poured into the latter, and, 10 grammes liquor ammoniæ sp. gr. ·880 being added, the mixture is thoroughly agitated. It is then for six hours kept at a temperature of about 50° C. on the water bath, and afterwards poured into ten times its weight of distilled water, and, after thorough agitation, left to settle. When clear, the water is slowly poured off, and to the material left in the vessel are added 10 grammes gelatine and 100 grammes of distilled water. The mixture is heated until the gelatine is dissolved. After cooling, the gelatinous material is passed through muslin, and immersed for six hours in an alcoholic chlorophyll bath. It is taken out, washed for six hours with water, and, after the water has drained off, the material fused by heating and filtered, is applied as a coating to the glass plate for the blue negative.

The film for the red negative is prepared in a similar way, except that no eosine is used, and, instead of the alcoholic chlorophyll bath, an alcoholic solution of aurine of one per cent. strength is employed.

The film for the yellow negative is prepared similarly to that for the blue, but without subjecting it to treatment in any bath.

In taking the negatives, the light may be passed through coloured glass screens, or the films prepared as above described for the negatives may be coloured, and in that case the negatives may be taken either with or without the coloured screens.

The screens employed are, for the negative to produce blue, a bright yellow or orange screen ; for the red negative, a green screen ; and for the yellow negative a light violet screen. When the films for the negatives are coloured, this is done as follows :—

The negative for blue is immersed for about ten minutes in a bath consisting of 1 gramme pouceau and 1 gramme bright or brilliant yellow with 1 litre distilled water.

When the object has much pink colour, the negative should be dyed as for the blue, and a screen of bright yellow glass should also be used.

The negative for red is treated in a bath consisting of 1 litre of distilled water with 1 gramme of bright yellow, or with ½ gramme bright yellow and ½ gramme Victoria blue.

The negative for yellow is treated in a bath consisting of 1 gramme Victoria blue with 1 litre distilled water.

In these three cases, instead of 1 litre of distilled water, there may be employed ½ litre of water and ½ litre of alcohol.

The exposure for producing the negatives necessarily depends on the light and the character of the object photographed. Under ordinary circumstances the blue negative with the yellow screen or coloured film will, indoors, require about ten seconds' exposure ; the red, without screen or with coloured film will require about one second ; and the yellow, with violet screen or coloured film, will require about eight seconds.

Before developing the negatives they should be washed in distilled water, and, if after developing any colour remains on the plates, it is removed by immersing them for a few minutes in a bath of alcohol, or by merely washing with water in the usual way.

The gelatine solutions to constitute the superposed films are prepared as follows :—For the yellow, 5 grammes of yellow chromium powder are dissolved in 250 grammes of water ; for the blue, 1 gramme of Prussian blue is dissolved in the like quantity of water ; and, for the red, 1 gramme of carmine is dissolved in the like quantity of water. Each of the solutions has added to it 35 grammes of gelatine, heated till the gelatine is dissolved and filtered. Other pigments may be employed, but I find those above mentioned very suitable.

For applying the gelatine solution, a piece of glass is placed in a dish filled with warm water, a piece of white paper is laid on it, both are taken out of the water, and the paper, after being pressed with a squeegee or roller to express surplus water, is coated with the gelatine solution, and, after the gelatine has set, is dried at a temperature of about 30° C.

The papers thus coated with gelatine are then sensitised by immersion for a few minutes in a bath of potassium bichromate of about five per cent. strength, and, after being dried in a dark room, they are separated from the glass.

For printing on these papers the several negatives are placed on the sides of the papers which are coated with gelatine, and exposed in printing frames in the usual way. When the printing is completed, each proof is placed, with the gelatine downwards, on a waxed glass, placed in cold water. The glass is taken out of the water with the wet proof adhering to it, and the surplus moisture is squeezed out of the paper.

The glass with the proof on it is then immersed in water heated to about 30° C., and, after a few minutes, the paper is peeled off from the gelatine, which is left for a few minutes until the image appears clear and transparent. Each of the gelatine films on glass is then withdrawn from the hot water, washed well in cold water, and dried.

Having prepared the yellow, blue, and red-coloured films on waxed glasses, printed photographically from their respective negatives, I effect their superposition on a sheet of white paper by a process of manipulation, which is as follows :—

I deal first with the yellow film and the paper on which the films are to be superposed. I put this paper, which has its one surface coated with gelatine, into a bath of cold water, allowing it to remain there for about five minutes I put the glass carrying the yellow film in water, heated to about 35° C., the yellow film presented upwards. I take the gelatined paper from the cold water bath, and lay it with its gelatined side on the yellow film, and, after about two minutes of immersion, I take the whole out together and leave them to dry. When dry I remove the glass, leaving the yellow film upon the paper. I then wipe the yellow film with a cloth soaked in benzole, so as to remove the wax coating which it had received from the waxed glass on which it was originally formed.

For superposing the blue film on the yellow, I first form a warm bath at about 35° C., consisting of 100 grammes gelatine, 100 grammes sugar, dissolved in 2 litres of distilled water, and filtered, and in this bath I place the glass with the blue film uppermost.

I soak the paper carrying the yellow film for about two minutes in a cold bath, and then place it face downwards on the blue. I immediately take the whole out of the warm bath, and, looking through the glass, adjust the blue film exactly in register with the yellow, and leave them to dry, after which I remove the glass and wipe the blue film with benzole to remove the wax.

For superposing the red film I first form a cold bath, consisting of 150 grammes gum arabic and 150 grammes sugar, dissolved in 1 litre of distilled water, and filtered, and in this bath I place the glass with the red film uppermost.

On this I place the paper, with the blue and yellow films downwards, and, after about ten minutes of immersion, I take out the whole. Looking through the glass, I adjust the red film in exact register upon the others, and leave the whole to dry, after which I remove the glass and polish the red film with a flannel. The paper carrying the three superposed films can then be mounted as desired.

Although I have, by way of example, described the order of superposition as being yellow, blue, and red, this order may be varied.

It is to be understood that the operator has to take the usual precautions against the action of light on the sensitised materials.

The process described is an example showing how the invention can be carried out practically, but the materials employed, their proportions, the times of exposure, the number of negatives and films, their colours, and the details of manipulation may be varied.

For instance, the coloured films, instead of being superposed on paper, may be superposed on another suitable surface, and, instead of employing gelatine for the films, other known substances, such as albumen or collodion, capable of giving transparent films, may be used, the manipulation being modified so as to suit the particular substances employed.

Having thus particularly described and ascertained the nature of the said invention, and in what manner the same is to be performed, I would have it understood that I make no general claim to the production or superposition of coloured photographic films, but what I claim in respect of a process for photographing in colours is:—1. The process for preparing and taking the several negatives suitable for printing photographically on differently coloured films, substantially as described. 2. The process for preparing the several differently coloured films and photographically printing them from their respective negatives, substantially as described. 3. The process of manipulation for superposing the photographically printed films, substantially as described. 4. The complete process for photographing in colours, consisting of the successive steps of operation set forth in the preceding claims.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
19	North Middlesex	
19	Richmond	
19	South London	*Lantern Slides and How to Make them.* Mr. Oakden.
20	Birmingham Photo. Society	
20	Brixton and Clapham	
20	Gospel Oak	
20	Hackney	
20	Hastings and St. Leonards	
20	Paisley	
21	Bury	
21	Croydon Camera Club	Special Cycling Excursion to Sevenoaks. Leader, A. Jenkins.—Photographic Chat, 8 p.m.
21	Photographic Club	
21	Southport	*Printing Dodges.* George Cross.
21	Southsea	
22	Glossop Dale	
22	Hull	
22	London and Provincial	Report of the Convention Delegates, with Lantern Illustrations. Messrs. A. L. Henderson and J. S. Teape.
22	Oldham	
23	Cardiff	
23	Croydon Microscopical	
23	Holborn	
23	Maidstone	
24	Croydon Camera Club	Excursion: Betchworth for Brockham Green. Leader, A. W. Hirst.
24	Hull	
24	Leytonstone	Ordinary Meeting.
24	South London	Excursion: South Side of Thames. Leader, Mr. Boxall.

North Middlesex Photographic Society.—Monday, the 12th inst., was a General Technical Evening. Mr. Gol ling brought some carbon prints, which, on development, showed some insoluble spots and blemishes in the sky, &c., and asked for the cause. Mr. MATTOCKS suggested splashes of bichromate after sensitising. Mr. MCINTOSH thought it was due to uneven blotting of the water from the back, and said he had given up blotting-paper for that purpose, and now generally used an old handkerchief and carefully dabbed it all over. Mr. Cox showed some blue prints which he had toned with the tannin bath to a beautiful brown. He had tried to bleach them after toning, and found that prolonged exposure to sunlight did discharge the colour somewhat, but he was of opinion that, properly glazed (which his prints had not been) and hung in an ordinary room, it would be some few years before the brown colour was discharged, if it ever was, altogether. Mr. MCINTOSH showed his focussing screen, which he had cut into strips and replaced in the holder, leaving spaces about an eighth of an inch between, and explained the great advantage derived from this method for interior work, copying, &c., where the image to be focussed was a very dull one, as, by the use of a focussing eyepiece, the image could be focussed in the air with great ease under conditions where, in the ordinary way, it would be almost impossible to see an image. Mr. Goodwin secured first place and Mr. Smith second in the Ruislip Competition.

FORTHCOMING EXHIBITIONS.

1895.

Sept. 23 ..... *Leeds. G. Birkett, City Art Gallery, Leeds.
,, 23–28 ..... *Westbourne Park Institute.
Sept. 24 ..... *Royal Cornwall Polytechnic Society. Edward Kitto, The Observatory, Falmouth.
,, 30–Nov. 2 ..... *Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 30–Nov. 14 ... *Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
Oct. 28–Nov. 2 ..... *Southport. G. Cross, 15, Cambridge-arcade, Southport.
Nov. 19–21 ..... *Hackney. W. Fenton-Jones, 12, King Edward's-road Hackney.
,, 28–30 ..... *Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

GELATINO-CHLORIDE PAPER.

To the EDITOR.

SIR,—I send you enclosed two prints, one quite fresh; the other has been two years, summer and winter, exposed to sun, dust, and atmosphere.

Please give your opinion on them, to benefit those grumblers who fancy washing, and toning, and fixing are done in the same careless way as with albumen prints.

These prints are toned with *one* grain to the sheet, and 100 cabinets take us about two hours, from the first water till ready to mount.

The gold bath is our own, and differs altogether from published formulæ, is neither sulphocyanide nor combined (no alum is used and no ice), and it is not a continuous one, but made fresh each day. And it seems to me, if the Association of Professional Photographers would arrange a competition in using the gelatino-chloride P.O.P., more benefit would come from it, for the profession, than from pleasure parties alone. Perhaps some of these professional manufacturers would support such a competition with 200*l*. I myself would not mind to compete against collodio-chloride paper, or albumen, in quickness of despatch, durability, equality of work, &c.

I may tell you in confidence, that, since I have dispensed with albumen and other papers, I feel quite a jolly fellow again.—I am, yours, &c.,

AUDACIOUS OPERATOR.

PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—You will be pleased to hear that in the case Ellis *versus The Ludgate Monthly* it is now definitely decided there is to be no appeal.—I am, yours, &c.,

HENRY GOWER, *Secretary.*

London Chamber of Commerce, Botolph House, Eastcheap, London, E.C., August 13, 1895.

Exchange Column.

*** No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, a short-focus, whole-plate studio lens, in exchange for cabinet studio lens and Mawson & Swan rapid rectilinear lens, both good definition.—Address, MILTON MEYERS, Enfield Town.

Will exchange pneumatic safety, diamond frame, balls throughout, good condition, for modern half-plate outfit, if approved.—Address, E. BROOK, photographer, 42, Talbot-road, Blackpool.

Will exchange eleven volumes of THE BRITISH JOURNAL OF PHOTOGRAPHY, bound (1884 to 1894 inclusive), and loose numbers of 1895, for good stereoscopic set (half or 7½×5), also large fox-skin rug, about four feet square, for quarter or half-plate "iris" rectigraph.—Address, J. A. C. MURRAY, Nightingale-terrace, Sutton, Surrey.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

John Terras, Lawhead View, Markinch, Fife.—*Portrait of the late John Balfour, of Balbirnie.*

D. C. Latham, Grove Studio, Station-road, Buxton.—*Two Portraits of Victor C. W. Cavendish, M.P.; one Portrait of Victor C. W. Cavendish, M.P., and Lady Cavendish.*

E. Landor, 2, The Mall, Ealing, W.—*Photograph of Two Kittens on a Table; Photograph of Four Kittens side by side on a Table; Photograph of Kitten looking in a Mirror.*

RECEIVED.—Lady Cook's second series of essays (24, Bedfordbury, W.C.).

W. WOOD.—Ordinary distilled water will serve the purpose.

"SANDELL."—The address is Bensham Manor-road, Thornton Heath, London.

TED.—Tintypes are made by the ordinary wet-collodion process described in every old manual.

E. B. L.—The address is The Anglo-American Varnish Company, St. Paul's-square, Birmingham.

WM. GARDNER.—A good rectilinear lens of five and a half inches equivalent focus, working at *f*-16, should cover a quarter-plate well.

C. O. W.—The error has been that an unsuitable kind of pyroxyline has been used. In future, employ pure alcohol instead of the methylated spirit of the oil shop.

G. B.—Dry collodion is slower than "wet collodion *at its best.*" A preservative has been employed with the samples sent. No formula has yet been published for the preparation of very rapid collodion emulsion.

CORRIS.—A metol-developed negative can be intensified by any of the methods applicable to pyro-developed negatives. If only a yellow stain all over the negatives is desired, any of the yellow coal-tar colours will answer—Judson's dyes, for example.

E. D. W.—Without seeing the original we judge the copy to be a very fair one. Don't sneer at the "plebeian glass positive." This process will yield very excellent results. It must not be judged from the standard of the beach operator, and that is, doubtless, the standard you have taken.

N. RINGER.—Refer to the paper read at the recent meeting of the Convention by Mr. Bothamley. In it you will probably see the cause of the discolouration or "fading" of the gelatine prints. What is the extra trouble in toning and fixing separately if permanency is any consideration whatever?

ARCHER CLARKE.—1. The copyright of the photograph can be registered, but we doubt, under the circumstances, if it will be of any benefit to you. 2. As you sold the photograph with the right to reproduce, and without reservation, you have nothing to complain of. You received a valuable consideration for your work.

THOMAS COUSIN (Dundee).—If you have departed from the formula and used materials different from those given, there is at once a reason for the failure. The formula is quite right if it be adhered to. Of course the emulsion should be white, and would be so if properly prepared. There is no way of putting the emulsion right, it is already spoilt.

T. W.—If several of the plates were broken when the boxes were opened, it is the dealer who supplied them you should communicate with, and not the manufacturers; you have had no dealings with them. We may mention that neither manufacturers nor dealers take any responsibilities in transit of goods after they leave their hands. That is a universal custom.

OPALINE asks: "Can you tell me how the white edging is given to the flush block opalines in the trade? some are mounted plain right up to the edge of glass; the ones I mean are those in which the print is centered on the glass, leaving a white edging of from a quarter to a half-inch width?"—The thing is a very simple one. The negatives are masked round the margins, so the paper beyond is protected from light so that it remains white.

A. H. PIEJUS.—We can only refer you to our previous answer. That which may answer best with one brand of plates is not necessarily the best with another make. The troubles enumerated are due to something faulty in the manipulations, but what we cannot say, except that, in the case of the crystalline substance, it is the hyposulphite of soda not sufficiently washed out of the film. Greater care will avoid the other troubles. We are glad that you are so well pleased with collodio-chloride paper.

D. B. (Surrey).—Prints that are made transparent and coloured on the back are usually mounted in optical contact with glass if they are coloured with water colours. After they are mounted on the glass, the paper may, with a little practice, be rubbed away with fine glass paper, leaving only the albumen, which is afterwards coloured on the back. Oil colour is generally used for this class of work, the picture being rendered semi-transparent with such materials as paraffin, white wax, Canada balsam, &c.

R. T.—It is not the slightest use copyrighting a portrait you were paid for taking three years ago. If the one portrayed has since become a notable personage, it is no concern of yours, and can in no way make you entitled to any property in the portrait. As to your supplying copies only on your own terms, if, at the time the portrait was taken, there was a tacit agreement, as there, doubtless, was, that after-copies were to be supplied at a stated sum—that is, according to your usual price—you must supply them at that price.

C. BELL.—The mottliness of the paper is caused by the solution upon which it was sensitised being too weak, notwithstanding what you say to the contrary. The bath may have been fifty-five grains to the ounce when first made, and been replenished with a solution of the same strength since, but it is not of that strength now. It must be borne in mind that, with constant use of a bath of the strength given, the paper takes up proportionately more silver than it does water, and, consequently, the solution becomes weaker. Therefore the bulk should be kept up with a stronger solution than that started with.

F. E. G. writes as follows: "What is your opinion with reference to following? I took a photograph of prominent gentlemen of this town some two years ago. About a month ago a man called and asked for a copy of said photograph, which it was intended should appear in a certain paper. I gave him a copy with the understanding that my name should appear below as usual, and which he promised. In due time the print appeared, both in the paper and also hung separately in the shop windows, but, instead of my name below, they had put another photographer's name, who is advertising largely in their paper. I wrote them pointing out the error, but they did not reply either by letter or in their next issues (weekly). As shortly there will be an issue of all the portraits they have got, can I not compel them to put correct name below? The photograph in question was not, of course, made copyright. Would it be possible still to do so with the gentlemen's permission whose photograph it is?"—The conduct was very unhandsome; but, as you have no copyright in the portrait, we do not see what you can do.

VILLAGE BARBER writes: "Kindly inform me as to the following:—Take the back combination of a Petzval portrait lens and separate the two glasses, and what will be the result (putting aside the disarrangement of the whole combination)? or close the two glasses, what will be the result? Will either way affect the length of focus of the one combination, or will the double combination be affected in length of focus? What will be the result in either case as to length or shortness of focus, or in diameter of field of view, by the separation or the closing the two glasses of back combination only?"—In reply: The separation of the back elements of a Petzval portrait combination will not sensibly alter the focus. The function of the back combination is twofold; it shortens the focus and it distributes over a flat field the image formed by the anterior lens, which, without the correcting influence of the back one, would be sharp over a very limited area. It performs this function by reason of its excess of negative aberration. By placing its elements close together this aberration becomes excessive, and destroys the perfect correction of the whole lens.

JAMES C. ALLAN writes: "I have studied all the standard works (and back numbers) on taking positives or ferrotypes, but can get nothing clear on the following: 1. Are there any ways or devices to take ferrotypes without being reversed (by extra lens device or reflector or otherwise) to look the way subject looked? 2. Can direct positives be done equally as well on paper as on metal cards, and if the same mode—collodion, &c.—is used? 3. Are ferrotypes stored up in a box for a week or two before use, coated with thin glycerine solution, as sensitive as those exposed after prepared? 4. What is the simplest (or best) developer solution that would keep good for a few weeks? 5. Would it be an advantage developing them in a mechanical rocking-tray bath while developer is poured on their surface? 6. Has one with ferrotypes to be careful that the sensitive surface does not get washed away with the developer?"—In reply: 1. Yes, by using a reversing mirror or a prism before the lens. If the picture is on glass it will be non-reversed if it be backed upon the collodion side. 2. Not for your purpose. 3. This query is not clear. 4. The developer given in the *Almanac* will keep for a few weeks. 5. We think not. 6. The gelatine film is somewhat tender while wet, and a certain amount of care must be used. Water will eliminate the glycerine if any be used.

CONTENTS.

	Page
OPTICAL AIDS TO FOCUSSING AND RETOUCHING	513
PHOTO-CHROMY AS IT IS	514
A POINT IN THE USE OF CARBONATES IN DEVELOPMENT.—II.	515
PHOTOGRAPHING LIGHTNING	516
THE ACTINIC VALUE OF LIGHTNING	516
THE EFFECT OF THUNDERSTORMS ON GELATINE PLATES	516
ORTHOCHROMATIC PHOTOGRAPHY WITH ORDINARY PLATES. By F. E. IVES	517
THE USE OF DRY PLATES IN PHOTO-ENGRAVING. By JOHN CARBUTT	518
SUGGESTIONS FOR IMPROVEMENT OF DEFECTIVE NEGATIVES. By J. VON NORATH	519
THE CAMERA IN THE EAST. By J. W. HADFIELD	521
BROWN *VERSUS* LANCASTER	523
A NEW SPORT	523
OUR EDITORIAL TABLE	524
NEWS AND NOTES	525
RECENT PATENTS	525
MEETINGS OF SOCIETIES	527
FORTHCOMING EXHIBITIONS	527
CORRESPONDENCE	527
EXCHANGE COLUMN	527
ANSWERS TO CORRESPONDENTS	528

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FOCUSSING A LANTERN PROJECTION.

Amongst a circle of boon companions it matters comparatively little that the intercourse partake of that elastic character, known as "free-and-easy" during the time a lantern exhibition is in progress. Quips, jests, and criticisms are then, if not exactly in order, at least not offensively out of order, and the slightest departure of the lanternist from what is considered the strict path of propriety in an exhibitor promptly called attention to.

It is good education for a budding lantern operator to have his shortcomings thus unceremoniously pointed out, although we have sometimes thought the education might be advantageously administered in a less drastic manner. "Focus more sharply!" is sometimes an oft-repeated cry; "That's better!" following as a sequence, when the curt exhortation has been complied with.

But audible vocal utterances of this nature, not less than the causes by which they are elicited, are so sadly out of place as to be offensive on semi-public nights, when the friends and relatives of the members are invited to be present to see pictorial works rendered by the lantern.

The other evening, at such a display, we had the infelicity of being seated about eight feet from the screen, and of noting the variations in sharpness of certain of the projections which with such slides and optical appliances as were used ought to have been critically sharp. Some were so, others were not. At the close we privately intimated to the exhibitor the desirability of his using a light but powerful opera glass, to be held in one hand while the other was engaged by the pinion and rack of the lens, these to be used immediately the new slide was inserted.

This suggestion was adopted with the happiest results, and our friend has decided upon never again giving a lantern exhibition without the aid of the opera glass to ensure sharpness on the screen.

When a distance of from twenty to a hundred feet intervenes between the lantern and the screen, every excuse must be made for the exhibitor not being able to focus every picture with the desired sharpness, more especially as his sight may be lacking in that degree of perfection so desirable under the circumstances; but, no matter what the intervening distance is, the utmost sharpness will in every case be ensured, provided such aid to vision as we have here mentioned is had recourse to.

Having made several trials of late with opera glasses of various degrees of strength, we find that, for ordinary or average use, one having a magnifying power of about three diameters answers the purpose well, although, if the intervening distance much exceeds the average, and is, say, one hundred feet, a glass of greater power than that indicated may be advantageously substituted. The mount of the opera glass should be made of aluminium, on account of its lightness, for we have found it irksome to be always raising up a heavy brass-mounted one. One thing, however, may be noticed, viz., that, when once the screen is brought into focus, the adjustment of the glass must be no more altered for that distance and that exhibitor.

The adoption of this simple expedient will prove an effectual remedy for imperfectly focussed projection on the screen, and thus do away with all objections which some carping critic may raise on that score. The best portion of the picture to examine for sharpness when focussing is about half way between the centre and the margin of the disc.

GOLD IN PHOTOGRAPHY.

It is not our purpose to write a treatise on bimetallism, though the erratic changes in the price of silver of late years have added to the difficulties of the plate-maker; gold being the standard metal in this country, the pound's worth of gold which a sovereign originally contained is still the measure of its value. It is of the physical qualities of gold and its salts that we now discuss. It is not a little remarkable that in the present day we never hear of this metal as a light sensitive agent. Yet, in the early days of the science, there was considerable promise in the experiments made in this direction. So long ago as 1840, Sir John Herschel investigated its properties at length, and these were still further examined by Hunt. Washing the surface of paper lightly with chloride of barium followed by a wash of chloride of gold, then exposing a few minutes to the sun's rays the portions of the paper acted on by light—first whitened by the light—became a full purple brown when held in the vapour of boiling water or even dipped in cold water. If for the barium salt oxalate of ammonia be substituted, the paper passes rapidly to violet purple; but, as the same effect is produced, though more slowly, in the dark, it would be difficult to utilise this property. Again, using acetate of lead instead of barium, we get a paper sensitive to light, the faint image so produced being capable of "development" by steam or cold water. Bichromate of potassium and

gold chloride solution give a light sensitive paper. When the print is placed in cold water, the yellow tint disappears entirely in the whites, while the image, which has passed in printing through deep brown to bluish-black, becomes, according to the extent of the solar action, crimson, blue, brown, or deep black. It is evident that here we have a fertile mine of experiment if any one care to work it; but, in modern photography, the chief interest of gold lies in the toning powers of its salts—mainly its chlorides.

It might be thought that little remained to be said upon this well-thrashed-out subject; but so far is this from being the case, that we may draw attention to two very interesting papers on the qualities of this salt which have recently been before the Chemical Society, a brief reference to one of them having already been given. When treating of "chloride of gold," most writers have in view the acid chloride. Very few people have ever seen the pure gold trichloride, free from acid. Indeed, Watts says, "the only method of procuring auric chloride perfectly free from acid salt is to decompose aurous chloride with water." This aurous salt is made by evaporating a solution of the acid chloride to dryness, heating the residue to about the melting point of tin, and constantly stirring it as long as chlorine is evolved. An almost neutral solution of chloride of gold is obtained by evaporating a solution of the acid chloride till the liquid is dark ruby in colour and begins to emit chlorine. When cool, the result is a dark red crystalline mass, very different from the usual yellow crystals. We may say that we have often pointed out, in instructions upon making toning baths, this fact. Ordinary solution of commercial crystals of gold chloride, or the double salt, is a pale yellow colour, but the neutral salt solution is entirely different, it is a rich brown. If a useful toning solution, uniform in character, is to be made, it is this brown, not the yellow, solution that should be employed.

The question of the volatility of gold chloride or chlorine has often been before chemists, and most varied have been the opinions they have given. While one says it is entirely unvolatilisable, another says it can be driven off by heat at comparatively low temperature. A word of explanation of a table recently quoted by us may be given: The volatility referred to an atmosphere of chlorine, the words of Mr. T. K. Rose whose paper was quoted from being "it is certain that, when gold is heated in chlorine at atmospheric pressure, trichloride of gold is formed and volatilised at all temperatures above 180° C., up to, and probably far beyond 1100°."

Lest some of our readers who manufacture, and wisely, their own chloride of gold may be under the impression that, during the heating of the capsule in which it is prepared, some of the gold may be lost by volatilisation, we will again quote from Mr. Rose: "It may be added that, when gold is heated in atmospheric air or coal gas, no gold is volatilised below 1050°, and only about 2 per cent. in thirty minutes at 1100°. There need, therefore, be no trouble anticipated in heating the gold chloride to expel free acid in the usual manner."

Similarly free from danger of decomposition will the heating, if moderate, prove to be, for, again quoting Mr. Rose, we have, "The decomposition of gold trichloride in air might be expected to become perceptible at 70°, requiring, however, about twenty-five years for its complete conversion into monochloride, AuCl, at this temperature. The observed rate of decomposition at 100° shows that a similar change would require about 1000 days at this temperature, while it results from calculation . . . that at 200°, thirty-six hours, and at the melting point, viz. 288°, less than one minute suffices for the complete decomposition of $AuCl_3$ in air. These interesting investigations, which have a practical value of their own, besides leading up to other practical aspects of our subject, do not leave us enough space to continue our survey at the present time, and we will therefore resume it at an early date.

RESIDUES FROM FIXING BATHS.

No doubt we are well within the mark in saying that probably not one amateur in twenty takes the trouble to collect the silver that is to be recovered from print washings and from the fixing baths both negative and positive, although, as is frequently being pointed out, this economy is well worth practising. Fewer still, we imagine, even if they save the waste solutions, will themselves undertake the—to the unpractised hand—somewhat onerous task of reconverting the collected residues into a utilisable form, namely, silver nitrate, since at the present day there are so few photographers, other than plate-makers and the makers of sensitive papers, who have any use at all for this once indispensable chemical. There are, however, still left a few experimentally inclined amongst both amateurs and professionals, and some of these do, as we are well aware, still adhere to the old practice of reconverting their residues themselves.

Naturally, where this is done, the tendency arises to perform the work in the simplest and easiest manner possible, and, as a matter almost of course, the task of fusing the recovered metal is avoided as far as possible by those who are but little familiar with a process that is by no means easy in the absence of the necessary appliances for the purpose. The reduction of even a small quantity of silver in "an ordinary kitchen fire" is a far easier job on paper than it will be found in practice, and, though we have in years gone by "run down" many an ounce of the precious metal with no more elaborate furnace than that mentioned, we are not at all surprised at the reluctance shown by others in following the plan.

There are, however, several alternative methods of reducing the silver by means of what is known as the wet method, in which either the solutions are made to yield up their contents in the metallic condition in one operation, or the precipitated chloride is further heated to bring it into that condition. So far as the carrying out of either of these plans is concerned, there can scarcely be said to exist any difficulty whatever, unless it can be in the latter case some uncertainty as to when the conversion process is complete. In fact, the reactions are so apparently simple and easy, that no thought is given as to the character and purity of the final result. As we are constantly seeing and hearing these wet methods put forward as being so much easier and practically as perfect in result as the more troublesome crucible process, we think it well to say a few words in the direction of indicating the weak points, and of showing how it is quite possible the final products may be wholly unfitted for photographic use.

First, let us deal with the wet treatment of precipitated chloride of silver. This is usually performed by submitting the mass of moist chloride to the action of scraps of metallic zinc, iron, or copper, in the presence of dilute acid—usually sulphuric or hydrochloric. The choice of metal is quite immaterial, except in the case of copper, on the score of expense, although, perhaps, this metal, on account of its greater freedom from impurities, gives the cleanest reduction, and often less

risk of the introduction of complications. In this process the reducing action is set up by the acid attacking the metal, which leads to the evolution of hydrogen gas, and this in turn attacks the chloride of silver, combining with its chlorine to form hydrochloric acid, the silver being left on the metallic slate in a black powder. The process thus becomes a continuous and, practically, automatic one, for, as one portion of acid is exhausted in attacking the zinc or other metal, a fresh portion is liberated to carry on the work; and so, if sufficient time be allowed for the completion of the process, we have at the finish a mass of reduced silver, together with the undissolved zinc, and a salt of the latter metal *plus* free acid in solution.

The first difficulty that will meet the novice at this work will be the imperfect reduction of the chloride. At first the action proceeds vigorously, and with great effervescence, and in a short time the mass of previously white chloride becomes perfectly black. It is well stirred up, in order to bring every portion of the chloride into contact with the escaping hydrogen, and soon all action appears to cease, and this, coupled with the uniform blackening of the chloride, leads to the assumption that the process is finished. The silver is collected, freed from the excess of zinc, carefully washed and treated with sulphuric acid, to remove any particles of zinc that may be mixed with it, and finally, when considered perfectly clean, is treated with nitric acid, to convert it into nitrate, only, however, to discover that a very large proportion of the chloride remains unreduced, its colour being masked by that of the reduced metal. The remedy for this simple difficulty is obvious; portions of the mass should be tested from time to time until it is found to be completely soluble in nitric acid, and not until then should the reduction be considered complete. Even when these tests are applied, it will often turn out that the solution in nitric acid is imperfect, and that a cloudiness remains after the acid has ceased to act. This means, in the first place, that a certain portion of the chloride has still escaped reduction; but it further means that, since chloride of silver is appreciably soluble in hot acid solution of the nitrate, a large quantity of it has been dissolved, and that the resulting solution is not one of pure nitrate of silver, but a nitro-chloride or chloro-nitrate. Whether such a double salt would act injuriously if used, say, for sensitising paper, we are not prepared to say, but the corresponding iodo-nitrate was formerly supposed to possess highly objectionable properties in connexion with the negative bath.

But, even supposing the reduction of the chloride to have been practically complete, and the residue most carefully washed and to have dissolved perfectly in the nitric acid, it is yet by no means certain that the product is pure silver nitrate, or, rather, it should be said, that it is certain that it is *not*. The researches of Stas and Boettger have shown that it is in the highest degree difficult to eliminate the last traces of the base metal from silver reduced by the wet method, even though the residue may be subsequently fused, and these chemists therefore recommend, for the purpose of obtaining silver of the highest degree of purity, the method of reduction with an alkali and a glucoside, a process which is quite as easy, while much freer from objection.

It is not to be supposed that the quantity of impurity introduced in this manner is very considerable; but, in the case of copper or iron, it might easily be sufficient to interfere with the integrity of printing results if the nitrate were employed for that purpose. In the case of zinc, from the known impurity of the ordinary samples, there would be the additional risk of the formation of silver sulphide along with the reduced metal, the effect of which will be referred to presently. Traces of iron in combination with the silver could, we may easily imagine, give rise to the formation of insoluble compounds, which would, sooner or later, impair the purity of the whites of any prints made with the contaminated nitrate, while copper salts introduced into the prints in the same manner would undoubtedly exercise a deleterious action, not only upon the finer gradations of the printed image, but also on the tone. How far these evils would be felt in practice would, of course, depend upon the amount of care exercised in the reducing process, which we are assuming to have been undertaken in the belief that little or no care is necessary.

The alternative method already mentioned is, in our opinion, much to be preferred. It consists in boiling the reduced chloride with an alkali, preferably caustic, in the presence of sugar, honey, or even gelatine, since the combined action of the heat and alkali converts the gelatine into the condition necessary for reduction. Caustic potash alone will convert the chloride into oxide of silver, in which state it is as easily converted into nitrate as the metal, but the addition of the glucoside not only hastens the process, but proves more economical. In following this plan there is no danger of metallic complications, and the after-treatment necessary is confined to the thorough removal of the excess of alkali and organic matter.

In conclusion, we shall allude to the most objectionable of all forms of reduction, namely, the treatment of hypo solutions containing silver with zinc or iron to throw down the metallic silver direct. This plan was relinquished as untrustworthy a quarter of a century ago, but is constantly cropping up afresh, having been mentioned only a week or two back. We cannot do better than point to the inevitable result of its adoption in place of reduction in the crucible, that is to say, when the reduced metal is to be redissolved in nitric acid. Commercial zinc, or zinc scraps especially, are far from representing the pure metal, and this material, when acted upon by acids, gives off anything but pure hydrogen. Moreover, when immersed in hypo solution, it is not difficult to detect by the smell that either from decomposition of the solution itself, or from impurities in the metal, or probably both, there is a copious formation of sulphuretted hydrogen, the effect of which, in the presence of silver in solution, is to be imagined. The treatment of a spent fixing bath with zinc, in fact, throws down a mixture of metallic silver and sulphide, which, if the reduced mass is to be subsequently fused, is a matter of no moment; but, if it be washed and redissolved in nitric acid, sulphide of silver being soluble in hot nitric acid, a result is obtained that can in no sense be considered satisfactory. An attempt we made in this direction many years ago resulted in a solution as yellow as saffron, and, even after repeated crystallisations, the salt still retained a strong yellow tinge, and was quite unfit even for printing purposes.

Those who intend to operate their own residues will therefore do well to bear these facts in mind.

Printing-out Papers.—Why, writes a correspondent, is gelatine paper called "printing-out paper?" He remarks that, if any distinctive term is necessary with the new papers, it should be applied to those requiring development. Have not, he adds, all papers for producing prints direct from negatives, from the

earliest period, been printing-out papers? That is quite correct. The old salted paper, albumenised paper, collodio-chloride papers, &c., are all printing-out papers; but they have never had that distinctive term applied to them, and they have now been in vogue since the earliest epoch of the art, except the last-named, which we have only had for thirty years or so. Our correspondent's idea is that the new papers which have to be developed should have the qualifying adjective applied to them. There is some show of reason in this; for, if ever albumen and plain paper are entirely superseded, it may be looked upon by future generations as having been a development paper. But what is in a name? The paper will work none the worse for being called printing-out paper.

Operators' Salaries!—The case tried in the Whitechapel County Court, a report of which was given in our last issue, involved no important point of law, as it simply resolves itself into a question of facts. But the case is interesting, as showing the wages that some photographers expect to get efficient labour for. Some little time back, it will be remembered, there was some correspondence in these columns with reference to an advertisement for an operator and retoucher who could print well, &c. The salary to be twelve shillings a week, to live in the house, and for seven days' services. At the time we knew that some of our readers looked upon the matter rather in the light of a joke than anything else: but the case just cited revealed the thing as a stern reality. The defendant in the case, who styles himself "Art photographer to the Queen," said that, as the plaintiff could not retouch, he engaged him at ten shillings a week, instead of twelve, as per advertisement. This is a fraction over one shilling and five pence per day, *plus* "live in." In this instance the extra qualification of retoucher appears to have been appraised at two shillings per seven days. What an outlook for "articled pupils" when they have served their term!

Insoluble Spots on Carbon Tissue. — Spots of late years, in one form or other, appear to have become a bane in photography. Complaints are that they are met with on plates, paper, on prints during washing, and often after they have been mounted for a short time; but, it is rarely that we hear of them in connexion with the carbon process. However, at the last meeting of the North Middlesex Photographic Society, some carbon prints were exhibited that showed some insoluble spots and blemishes on development. Different causes were assigned for the trouble by those present. As we have not seen the examples in question, it is quite impossible for us to pass any opinion as to how they originated. We will, however, mention a cause of spots that gave a great deal of trouble in an establishment, some years ago, until it was discovered. In that establishment it was the custom to dry the tissue in the same room in which it was sensitised, and, to facilitate the solution of the bichromate in making the bath, it was roughly pounded in a mortar. Eventually it was noticed that the spots only made their appearance when a new solution was mixed, or the old one replenished. Finally, it was proved, beyond doubt, that the insoluble spots were due to minute particles of the bichromate in the air settling on the tissue while it was drying. The system of pounding the bichromate was then abandoned, and there was never again a trouble of spots.

Collotypes as Opalines.—The use of the collotype process for prints mounted in optical contact with glass—opalines—seems to be extending, and certainly not to the credit of the process, or to that of photography, if one may judge by some of the work now shown in shop windows. A few days ago we stopped to look at a large number exhibited in a window and outside a shop, where they are apparently made somewhat a speciality of, and we must say they were some of about the worst collotypes we have ever seen. They were chiefly views of London, and bore the names of English as well as foreign houses. Many of the prints had evidently been a long time in stock, and exposed to a strong light. They had clearly been printed in a colour to imitate silver prints, and on a tinted paper. The lake or other warm colour used in the ink had faded, and left the image of a dirty brown tone, and the tint of the paper had also been discharged, and left an unpleasant yellow colour behind. Altogether, the show was highly discreditable to the collotype process. The prints themselves, when they were first produced, were not so bad, but the method of mounting them made them look worse by showing up the coarseness of the grain. We have before remarked that the way to show a bad collotype to the worst advantage is to mount it in optical contact with glass. Cheapness is clearly at the bottom of this inferior work, for, at the prices at which these opalines were marked up, good results could not be expected; but so much the worse for the credit of photography.

The Projected Big French Telescope.—Every now and then we hear something fresh about the large telescope that it is proposed to construct for the French Exhibition to be held in Paris in 1900. Some little while ago it was rumoured that the idea had fallen through, but that, according to the latest report, is not the case, although the details are said to be considerably modified. The latest notion is that of enabling five or six hundred people at a time, in a building, to see the moon as if they were only a hundred kilometres away from it. The object-glass of this instrument, if the idea is carried out, will be the largest in the world. Its diameter is to be a metre and a quarter, equal to a little short of fifty inches English. The tube will be sixty inches long, and the image is to be received by a mirror of two metres in diameter, and then reflected on to a ground-glass screen at one end of hall, in which are seated the spectators. The mirror, it is stated, will be forty centimetres thick, and will weigh between three and four thousand kilogrammes. It has been computed that with this instrument any object on our satellite the size of Notre Dame could be distinctly seen, or the movement of a regiment of soldiers, if the moon possesses one, clearly followed. All this reads very well, and if the project is carried out the result will be looked forward to with interest. It is not a difficult matter to make an object-glass of the size mentioned, the real difficulty is securing perfection in it, and without which it will be next to worthless. The working of a perfect mirror of the dimensions and weight named will not be an easy matter, to say nothing about the faultless annealing of the mass of glass. However, there are yet five years to the Exhibition.

JOTTINGS.

The German Emperor, during his recent stay off Cowes, is said, by a contemporary, to have gone ashore one morning at daybreak and knocked up a photographer to take his likeness. "The artist, annoyed at having been aroused so early, told his customer to go away and come later, but, since he has learned who his patron was, he has been going about, metaphorically speaking, ready to smash his camera or cut his throat, or do something else desperate at his grief at having missed such an opportunity. It was a vexation to be found wanting when an Emperor called, and that without the intervention of a tout."

Making every allowance for the impulsiveness and eccentricity of a young ruler who, by the amusement and surprise his remarkable sayings and doings universally create, is casting a strong and useful light on the absurd side of hereditary monarchy, I find it rather difficult to believe this story as it is here told. The probabilities are decidedly against it. Granting its accuracy, however, I do not know which to be more surprised at: the mysterious state of mind which could impel a man to wish to have his portrait taken at early morning, or the failure of the photographer to know that there was only one person in the world capable of seeking his professional services at that queer time.

A correspondent of a cycling paper having recommended cyclists to diversify their excursions on the wheel by photography, another rider writes to explain the reasons which, to his mind, operate so fully against cyclists taking up photography to any extent. These reasons are both wise and stupid, but not in equal proportions, and

are interesting as showing how foolish a man can be when handling subjects with which he is imperfectly acquainted.

"Firstly," says this sapient counsellor, "there is the question of carrying the camera and all the extra weight entailed, and then there comes the consideration of the time to be spent in developing, printing, toning, and the many other processes that take up the time which a cyclist naturally wants to devote to riding. Who, when once having spent the evenings on country roads flying along on a cycle, could reconcile himself to drearily moping in a dark room or cupboard, developing plates which may or may not be worth looking at when completed? For the ease-loving elderly tourist there may be some charm, but for the ordinary air-loving, speed-inclined wheelman I think photography is out of place. If I ever think a scene very beautiful, I simply go and view it again in nature, and do not yearn for any unnatural reproduction of it. Then I would warn wheelmen that photography costs money, and a good deal of it too. I know one cyclist who professes to spend 30*s.* a week on it, so that a thought of where the means are coming from might not be out of place, considering that a cycler has always a certain number of expenses inseparable from his sport."

Of course, it is not necessary, or worth while, to expose the wretchedness and childishness of the arguments with which this unique genius attempts to persuade cyclists that photography need interfere to an appreciable extent with the pursuit of their charming pastime. Indeed, this is emphatically a case where all that requires to be said in reply to his deliverances is, Comment is needless. A man who, in this year of grace solemnly tells us that, when he thinks a scene beautiful, he simply goes and views it again in nature, and does not yearn for any unnatural reproduction of it, is out of place, except in a glass case at the Natural History Museum. His silly remarks, however, are well suited to the season of the year, and I reproduce them for the amusement of my readers.

"Cheer up!" the Convention cry, appears to have made its way into the outer world, and to have got a young lady into trouble with the Police authorities. A friend who writes me that he could not resist calling my attention to "the effect of famous sayings," encloses in his letter this extract from a London morning newspaper: "Cheer up!—At the Thames Police Court, Julia Davis, twenty-five, a needlewoman, was charged before Mr. Haden Corser with disorderly conduct. Police constable KR said that on Monday night a prisoner was brought into Bow Police Station. The prisoner came up and shouted through the window, 'Cheer up, old pal; they won't kill you.' She followed this up with such a torrent of bad language that he was forced to take her into custody. The prisoner: 'I never used no bad language. A lady had a friend of hers locked up, and she asked me if I'd shout through the window. I only shouted "cheer up," and he took me.' Mr. Corser: 'He says that you used bad language.' The prisoner (surprised): 'Me use language! I only had two glasses of beer.' The assistant gaoler proved a long list of previous convictions against the prisoner. Mr. Corser said it was no good fining or cautioning her. She would have to go to prison for one month. The prisoner: 'All right. Cheer up!'" Oh, fie, Julia! I am quite sure that the members of the Convention would not quarrel with you for having appropriated their "cry," but to have trailed it through the mud and mire of a police court is an offence for which there is no forgiveness, unless you promise in future to further imitate the worthy Conventioners and abstain from "glasses" and "language."

Mr. Jerome K. Jerome has not put my name on the free list of his entertaining and lively paper, the *Idler*, while motives of economy debar me from buying it, so that I do not see it regularly. I am therefore indebted to "A. U.," the incisive and well-informed art critic of the *Star*, for the information that Mr. Jerome printed the following notice to his readers at the end of the last number of the *Idler*: "I am satisfied that quality, and not quantity, of illustrations is what my readers desire. Poor photographs and cheap drawings badly reproduced, lumped down upon the pages of a magazine without discrimination or selection, must have begun to pall upon subscribers to modern periodical literature."

Time after time it has been pointed out in this JOURNAL that the poorness of the phototypically reproduced illustrations which have been so disagreeably prominent in the magazines and newspapers was bound, in the long run, to produce a reactionary effect on the reading public. That we have in reality, and not merely in imagination, reached this state of affairs must by this time be apparent. A week or two ago, Sir William Ingram, of the *Illustrated London News*, expressed his determination to partially abandon processed pictures, and now we have so shrewd and alert a journalist as Mr. Jerome following suit. I am convinced that the public will never tire of *good* drawings or photographs, well reproduced and printed; but how often do we find the qualities which this consummation implies united in the pages of the illustrated press?

It is quite the fashion to blame the poor photographer for the lamentable depths to which photographic illustrations are descending. "A. U.," in particular, is very severe in his attack. He says: "The craze for the photograph is over. Photographers have ruined their business, and, incidentally, the cheap magazine, which is something to be thankful for." But the blame for the obviously poor quality of so many "processed" illustrations by no means rests on one pair of shoulders; photographer or artist, blockmaker, paper-maker, and printer, all have a greater or less share in the triumphs of smudginess, of which, in so many of our popular papers and magazines, we are all getting unfeignedly sick.

"Thrilling in its generosity" is what a friend caustically styles the offer of the "Society for the Promotion of Photography" to give away 1000 magazine hand cameras. I reproduce the terms of the offer, which is a monument of disinterested philanthropy:—"Given away! 1000 magazine hand cameras! The Society for the Promotion of Photography, in order to encourage the practice of this fascinating and refining amusement in every home, will send each novice (male or female, irrespective of age), free of charge, a New Magazine Hand Camera, carrying twelve dry plates in metal sheaths. This wonderful camera (taking instantaneous *carte-de-visite* portraits or views) is not a loan, but an absolute gift from the Society to those anxious to learn the rudiments of this beautiful art; therefore skilled photographers are not eligible for this free distribution, but must purchase at the full price. The Society, moreover, in order to encourage proficiency, will issue with each camera twelve coupons, entitling the beginner to participate in twelve monthly distributions of valuable prizes, which will be given (according to merit) for portraits or views produced by the apparatus. A book of instructions, enabling even a child to learn photography and obtain a valuable prize, will be sent with each camera, and the names and addresses of winners will be published each month. 1000 cameras are now ready for free distribution; therefore apply at once, as this generous offer of the Society may not be repeated. Note.—Clergymen, schoolmasters, and opticians supplied with one dozen for judicious distribution. Each applicant for a camera must enclose 2*s.* 6*d.* to prepay parcel-post charges, and for dry plates, coupons, and instruction book, address, the President, P.S. Department, c/o. the Camera Company, 14, Balcombe-street, London, W."

You will notice that "skilled photographers are not eligible for this free distribution," so that at one stroke every reader of this JOURNAL is debarred from profiting by the Company's kindness. This is very much to be regretted, for, no doubt, the camera, lens, sheaths, &c., are of exceedingly good quality, otherwise the Society's "absolute gift," with the necessary dry plates, coupons, and instruction book, would not entail the disbursement of the comparatively large sum of two shillings and sixpence for parcel-post charges. Really there are occasional drawbacks and disadvantages in being "skilled" in photography. Happy "novices!"

I passed part of a morning recently in exploring that fine piece of engineering work, the Tower Bridge. This appears, from the number of foreigners I saw leisurely examining it, to have become one of the most popular show places of London—so much so that it struck me there was a good opening for a shop or kiosk to be devoted to the sale of Tower Bridge photographs, if a location could be found for it near the northern approach. By the way, the towers by which, after climbing up innumerable steps, one is enabled to cross the bridge at its top, are glazed with yellow glass, which cuts off, at a guess, some forty per cent. of the light, thus rendering the ascent here and there even on a bright day a somewhat dark, and therefore disagreeable, one. If anybody connected with the City Corporation should read these lines, I hope he will suggest to the proper authorities the advisability of substituting white for yellow glass. It will not spoil the appearance of the towers, and will give more light where it is much needed.

I suppose all users of the commercial bromide papers have noticed that, during the last few years they have, generally speaking, been coated with emulsions of much greater rapidity than were formerly employed for the purpose. The extra speed is, no doubt, advantageous for enlarging; but personally, for contact work, I prefer slow bromide paper, for the same reason that I prefer to use, whenever practicable, slow plates: there is not so much liability or tendency to over-expose. Out of curiosity, the other day, I exposed a piece of modern bromide paper in the camera and, the light being good, obtained a fairly well-exposed negative in a tenth of a second.

Among London Photographic Societies it would be difficult to find one which in usefulness, energy, and earnestness, surpasses the North Middlesex. The members of that Society have for years worked well and harmoniously together in the study and practice of photography, and, as a result of these efforts, the Society to-day includes among its members some of the ablest practical and artistic photographers that we have. Numerically, the Society is in a flourishing condition, its meetings are always well attended, and a gratifying degree of interest is manifested in whatever subject is brought up for discussion. Not a little of this success, of which he may justifiably be proud, is due to the painstaking care, watchfulness, and example of Mr. J. W. Marchant, who for some five years has been president of the Society, and now, after that long spell of responsible work, seeks the well-earned ease of retirement. I sincerely congratulate Mr. Marchant, and those who have loyally co-operated with him, on having made the North Middlesex what it is, and I am quite sure that under the sway of his accomplished successor, Mr. J. C. S. Mummery, it has a long career of photographic progress before it.

Mr. Fred Hollyer has been kind enough to send me a number of platinum-printed portraits, which he says I am not to be grateful for, as they are the efforts, on trimmings, of a novice in platinum printing. The portrait is that of an individual with whom I am supposed to have a relationship, and is pronounced, by those competent to judge, a very good likeness of the original. Both in portraiture and in the reproduction of pictures, Mr. Hollyer has gained much renown, and it may interest my readers to know that he devotes himself almost exclusively to platinum printing, a process which he adopted at its introduction, and that he develops his negatives with ferrous oxalate. So conspicuously successful an instance of the wisdom of sticking to one printing process and one developer should convey a valuable object-lesson to those photographers who are so fond of chopping and changing from process to process, with not too satisfactory results.

Apropos of printing processes, nobody seems to have thought it worth while replying to "Bohemian's" letter (p. 512), in which he asks for the best printing process for a travelling photographer other than silver printing-out methods, which, he points out, take up too much of an itinerant's time. Let "Bohemian," then, work platinotype by daylight, or bromide by artificial light. Both processes possess the maximum of expeditiousness, and give prints in that "first-class style" which he desiderates. But what a pathetic state of technical darkness "Bohemian" (evidently in some respects a well-informed photographer) must be in to require information on a simple point like this, of which a newly fledged amateur would blush to admit ignorance!

COSMOS.

THE MOSELLE: A CONTINENTAL BYWAY.

By an Itinerant Photographer.

WHY the beautiful Moselle, with its rugged banks covered with vines and forests, with its mediæval castles crowning almost every height, with its quaint villages of half-timbered houses, should be unknown and unvisited by Englishmen, is sufficiently astonishing; but why the Germans themselves should not haunt its banks during August is much more a matter for surprise. Had we in England any stream with but ten miles of the type of scenery which extends from Coblenz, where the river enters the Rhine, upwards for a length of ten or twelve times that distance, it would be the bourne of throngs of sightseers crowding by excursion trains from most of our big cities. The question is a difficult one to answer; probably fashion has something to do with it, the fear of entering a district where the guide-book tells us the French and English tongues are unknown has still more; and perhaps that same guide-book, which contemptuously describes its towns as dirty and its inns as third-rate, is to be thanked still more, for preserving the beautiful Moselle from the Cockney and Yankee tourist, and the big stiff hotels which are erected to supply his wants. If so, the guide-book has unwittingly done us a service. Suffice it to say that, in the course of this, the second holiday we have spent upon the river, we have encountered few other tourists, amongst which can be numbered but one Englishman.

The district which is known as the Eifel, through which the lower part of the river's course lies, is, roughly speaking, triangular in shape, having at its corners the three ancient cities of Cologne, Coblenz, and Trèves. The Moselle, winding along with what the guide-books describe as "excessive sinuosity" between the two last-named towns, acts as its southern boundary, having on its northern shore the wild district of volcanic origin, called the Eifel mountains. Access from England is both quick and cheap, a large number of routes affording opportunity for selection. Any line of rail having Trèves, Aix-la-Chapelle, or Cologne, for its destination may be selected, that *viâ* Ostend, Brussels, Aix, and Cologne being our choice in this instance.

Leaving London at half-past eight on a hot July evening, a run of two hours, at the almost supernatural velocity habitual with Chatham and Dover trains, landed us at the Dover Town Station whence, at a slightly modified speed of some two miles an hour, the train wended its way down the pier to the boat. The crossing was a fine one, agreeably cool after the London heat and crowded train, and a steam of three hours brought us to Ostend just before sunrise. Here the train for Cologne awaits the boat, and, leaving at three a.m., reaches the latter town at midday. Cologne is too well known to English travellers to need more than a passing word, and at this time of year is best hurried through, a course adopted by ourselves, as with faces streaming with perspiration we emerge after spending nine hours on the hottest of hot days in a carriage with both windows up. How this was so demands a word of explanation. Our fellow-traveller, a remarkably fat man of German extraction, had not travelled many miles before he insisted in a manner more forcible than polite on having both the windows and ventilators closed. Yielding to his wishes with as much grace as we could assume, we closed them. The day got hotter, we were lightly clad, our fellow-traveller was well wrapped up for a Channel passage, we kept them up. The sun blazed into the carriage; as the train crawled slowly along through Pepinster, Aix, and Herbesthal, our friend perspired; knowing his terror of draughts, we sealed him up as securely as if he had been ether or collodion. He soon began to ooze, then a pool of perspiration collected on the floor at his feet, then he began to gasp, and when Cologne was at last reached he was in the precise condition in which the Turkish bather likes to be when he puts himself under the hands of the shampooer. With a hope that in future he may be a believer in ventilation, at least to some extent, we left him on the platform and hastened to the quay, where, during a pleasant steam of eight hours up the Rhine, we forgot the discomfort of the journey long before we got to Coblenz, our starting-point for the Eifel.

From this town steamers are advertised to leave four times a week for Trèves, and if practicable one of these should be taken. We rise early, and, intending to breakfast on the steamer, hurry off to the pier only to find that the boat which we were assured would leave at 6.30 a.m. cannot run owing to want of water, no uncommon occurrence at this season; so

hat there was nothing for it but to take the train to Cochem, the loveliest of all the Moselle villages, and the first at which we intended to stop. Moselweiss, Alken, Hatzenport, Moselkern, and Clotten, villages *en route*, are all worth a visit by the photographer. And here we would put in a protest against a very common misunderstanding under which labour many photographers in England. We do not want, say they, a place of fine views and wide prospects, we want a spot where we can make pictures, not mere beautiful scenery. They imagine the Moselle, the Lahn, the Neckar to be like the Rhine, almost useless from the photographer's point of view. No greater mistake can be made. It is true it is not marshy, that one can go fifty miles without being reminded of East Anglia, and that fogs, mists, and windmills are conspicuous by their absence. But, on the other hand, every village teems with work for the camera in the shape of buildings of the most picturesque (and ruinous, if that does not follow as a matter of course) description, with quaint corners, interior and exterior, and with figure subjects innumerable. Moreover, these have not been photographed to death, exhibitions have not been filled for many years with such subjects as *On the Moselle*, *Evening; Evening on the Moselle; The Moselle*, *Eventide; Sunset on the Blue Moselle; At Ev'en* (the Moselle), &c. While being beautiful, they possess at the same time the charm of being fresh. To see this aspect of the district, it is not sufficient to pass through it on the steamer, should it be running, but the villages themselves must be visited, and their narrow, tortuous, and in some places smelly streets traversed. It is here that one finds opportunity for the exercise of his talents in the selection of subjects from the many that present themselves for depiction, it is here that is to be seen all that grace of outline, that subtle charm, that—but stay! this is not intended for an art paper, but a mere record of our experiences, as a guide for any who may care to follow us, so we must cut short what we fear the Editor of the JOURNAL would describe as *gush*. In the Moselle villages an artistic eye is, of course, of use to the photographer, but an artistic nose will be found much more so. While the hotels, or rather inns, are situated in clean, pleasant places, the most picturesque bits for the photographer are invariably to be found in quarters of the most odoriferous nature, and the photographer who allows himself to be guided entirely by his nose, going only up those lanes and alleys where the smell is worst, will find such to be a never-failing method of reaching the beautiful old timbered houses and cottages which afford so much scope for the camera. Every village, without exception, right up to Trèves, will repay a visit.

Cochem itself is a good centre for excursions to Moselkern, Clotten, Beilstein, Bremm, and Alf, since in Cochem the Gasthof zur Union, with its proprietor, Herr Pauly, who speaks English, affords comfortable quarters for the traveller. From Cochem to Alf the steamer winds round curve after curve, giving plenty of work for the hand camera from its decks, which may be left at Alf for a climb up the Marienburg—a hill which can be ascended in about half an hour. From the summit four reaches of the Moselle can be seen, stretching out to four different points of the compass in two pairs apparently unconnected. Descending the other side to Pünderich, the steamer, which has had to make a *détour* round a bend of eighteen miles, can be regained. From Pünderich to Trarbach, our next stopping point, the river presents a most delightful series of views, the hills sloping down on one side, the villages on the other coming right up to the water's edge, and having their quaint old houses reflected on the calm surface of the stream. At Trarbach itself the Belle Vue Hotel affords us its shelter once more, as it did during a more hurried visit last year, and, with this as a centre, photographic trips are made to the beautiful villages of Wolf, Enkirch, and Berncastel. Here we find ourselves, in our ignorance of German, thrown upon the phrase-book and dictionary to supply our wants, and, if the former annoys us by its unsatisfactory nature, it at least affords an almost endless source of amusement. Beginning as they all do with a remark that all other phrase-books contain much useless and unpractical matter, which in this particular case has been omitted, we put sufficient faith in it to enter a tobacconist's for a supply of matches. The German for matches being unknown to us, a hasty reference to the phrase-book is made, only to find that the nearest requisite, alphabetically speaking, for which with its help we can ask, is a maidservant. Not requiring one at the moment, we have to indicate our want by means of signs, which are eventually successful. Our next attempt to converse with the aid of the book was equally fruitless. Turning to its pages in the hope of finding the phrase, "Thank you, good morning," we find such an unusual expression does not occur in the eminently practical volume, but instead our eyes fall upon the following every-day remarks: "It is folly to engrave a Greek inscription at the top where it cannot be read;" "There is no mistaking that building, it is the Exchange," and so on. So much for the phrase-book, but with all its shortcomings the tourist, unless his requirements are much out of the common, should have but little difficulty.

The Moselle inns, while of the most comfortable and homely nature, are as cheap in their way as the Rhine hotels are dear in theirs. The few necessaries in the shape of cigars and cigarettes cost a mere trifle, while fruit in abundance can be got for nothing from the apple, pear, and plum trees which line the roadsides, and form a pleasing substitute for our hedges. The only extra which can be regarded as dear is the wine. This, differing from what is the case in France, is not so cheap as would be expected in a wine-producing country, varying in price from one mark per bottle upwards indefinitely, but that at the low price mentioned is certainly very palatable. The fruit trees just mentioned line all the roads, and their fruit is allowed to lie almost unheeded on the ground, the little train on the short branch line leading to Trarbach from Pünderich brushing the apple-trees as it runs along.

From Trarbach the best village, photographically speaking, is Enkirch, although Wolf and Croev are also well worth a visit with the camera, containing many old houses with carved timbers. Berncastel, sixteen miles off by river, is distant only three miles by road, but a three miles which take a good hour and a half to accomplish on a hot day. It is an interesting little town, with some of the most curiously shaped houses we have ever seen. These, unfortunately, do not lend themselves well to photographic treatment, but repay examination by the sightseer.

(*To be continued.*)

A NOTE ON EXPOSURE.

A SENSITISED plate is acted upon by the light reflected upon it through the lens from the subject of the picture.

The efficiency of this action depends mainly upon:—

A, the nature of the subject, or reflector, and its distance from the lens. Distance *per se* only affects the result up to thirty feet, beyond which the intervening atmosphere has a similar effect, aided by the blue reflections from the sky.

B, the quantity of light permitted to act; this is regulated by the stop, or diaphragm, and varies for a given lens with the area of the stop, that is to say with the square of the diameter of the aperture.

C, The quality or strength of the light used; whether it is full sunshine or merely diffused and twice reflected light.

D, the intensity of the light. This factor is governed by the altitude of the sun; for not only is the light which reaches us from the sun actually brighter when the sun is at a high elevation than when it is near the horizon, but its chemical activity upon the plate is greater.

E, the sensitiveness of the plate or film used.

Finally, there is the *exposure*, or *time* during which the light is permitted to act.

Though the other factors are sufficiently clear, there will be frequent occasion for the exercise of discretion in determining factor A, even when the subject falls precisely under one of the headings given in the table, for the colours of buildings and foliage and clothes vary in actinic power. Experience will suggest other modifications not easy to reduce to a system; thus it has been found that at high elevations, *e.g.* 5000 feet above sea level, shorter exposures are required.

These factors have often been tabulated; and, although many affect to scorn their assistance, such tables are practically indispensable to the beginner, or to the amateur who is unable to attain the facility which only comes from constant and frequent practice.

In the annexed table I have endeavoured to condense and simplify the information given by Burton, Scott, Howard Farmer, C. Wood, W. E. Debenham, and others. The exposure indicated is a full one, and, though Mr. Ewing's tables work out to about three times the amount, most tables prescribe less. But tastes and methods differ; it is, however, easier to make a good negative when the exposure has been in excess than when it has been too short. Captain Abney's rule is, even for the strong contrasts of Swiss mountain scenery, "Expose for the shadows; and by the use of brains in mixing the developer, and by patient and careful development, bring out the high lights in their proper gradation." So Mrs. Main recommends for snow scenes a slow plate, a small stop, and a full exposure.

The second table shows the altitude of the sun for certain latitudes, and from it the sun's altitude for most localities may be read with sufficient accuracy for all practical purposes.

In the field, the altitude of the sun can be approximately ascertained in various ways: I have myself marked the angles from 0° to 90° on the back frame of my camera; by placing this parallel to the sun's rays, the sun's altitude can be read off from the shadow of a pencil or card held at the corner of the quadrant. I find my span at the length of the outstretched arm covers about 30°, and four fingers about 10°. Or we may take the length of the shadow of a three-inch rod, thus:—Shadow, 0-$\frac{1}{2}$ inch, 1-2 inches, 4–6 inches, over 9 inches. Altitude of sun, 90°–80°; 70°–54°; 36°–27°; under 18°. Ingenuity will suggest other methods.

Index of definition, a formula for selecting the stop. The formula $a\ d=3f^2$; where f is the focal length of the lens in inches, is calculated for a disc of confusion less than $\frac{1}{100}$ inch, *i.e.*, for optically sharp definition, with a lens giving a flat field. Distance of object in yards = d.

It will be noticed that this is constant for any given lens: thus a d=75, for a 5-inch, or 192 for an 8-inch lens, whatever may be the distance or the stop; this number I call the index of definition for the lens. To use the formula:—

(1.) Focus on a distant object, and all beyond d yards will be in focus with *f*-a stop. (Compare Salomon's & Higgins's *Tables* in The British Journal Photographic Almanac, 1895, p. 948.)

(2.) Focus on an object at d yards distance, and all beyond $\frac{1}{2}$ d yards will be in focus with the same *f*-a stop.

Therefore focus on an object twice as far off as the nearest portion of your subject, and use the stop indicated by the equation.

Size of Image is to size of object as focal length of lens is to distance.

Angle of view.—The side of the plate being p, when p-*f*=respectively ·5, 1, 1·5, and 2, the angle of view is 28°, 53°, 74°, and 90°. Intermediate angles may be inserted by proportional interpolation, noting that for the four intervals differences of 1-10 will give approximately 6°, 5°, 4°, and 3°.

Universal Exposure Table.

Rule:—Multiply together the factors corresponding to A, B, C, D, and E to ascertain exposure in seconds.

Factor.	A. Subject and Distance to Shadows.	B. Stop, Quantity of light.	C. Quality of Light.	D. Altitude of Sun; intensity of Light.	E. Plate.
$\frac{1}{16}$	Clouds or distant mountains: over $\frac{1}{4}$ mile.	U. S. 1, *f*-4	Expose for shadows. Shorter exposure is necessary at high elevations, *e.g.*, 5000 ft. above sea level, or may be indicated by colour of buildings or foliage. Intermediate multipliers $\frac{3}{32}$, $\frac{3}{16}$, $\frac{3}{8}$, 3, 6, for *f*-10, *f*-14, *f*-20, &c. Index of definition $ad=3f^2$, stop *f*-a. Focus on distance all beyond d yards is in focus: Focus on d yards, all beyond $\frac{1}{2}$d is in focus.		W = Warnerke Sensitometer number.
$\frac{1}{8}$	Seacoast with sky and ships: $\frac{1}{4}$ mile.	U. S. 2, *f*-5·6			
$\frac{1}{4}$	Open landscape, or distant view, no near foreground: 100 yds.	U. S. 4, *f*-8			25 W. Ex. rapid.
$\frac{1}{2}$	Landscape with trees: 100 feet.	U. S. 8, *f*-11	Full Sunlight.	Sun in zen 90°—80° ab. horizon.	22-23 W. Rapid, 60 times.
1	View with near building or trees: 40 feet.	U. S. 16, *f*-16	Bright diffused light.	Sun 70°—54° ab. horizon.	20 W. Ordinary, 30 times.
2	Dark foliage in close foreground: Buildings in shade 20 ft	U. S. 32, *f*-22	Dull light.	Sun 36°—27° ab. horizon.	17-18 W. Slow, 15 times.
4	Portrait out of doors. Copying same size: 10 feet to deep shadows.	U. S. 64 *f*-32	Very gloomy.	Sun 18°—14° ab. horizon.	15 W. Slow, 10 times, Wet plate.
8	Under trees in woods, Indoor portrait near large window.	U. S. 128, *f*-45	Slight fog.	Sun 9°—7° ab horizon.	F. B. Taylor, Berhampur 9-6-95.

Note:—For portraits in ordinary room multiply by 16; for interiors, by 64 or read B × C × D × E as minutes; for enlargement or reduction n times, multiply by $(n+1_2)$, and then distance of lens from plate = (n+1) f = n times distance from original.

Table to show Altitude of Sun.

Latitude North 53° 40° 0° 23°	June 21.	May 22. July 22.	April 21. Aug. 21.	Mar. 22. Sept. 21.	Feb. 20. Oct. 21.	Jan. 20. Nov. 21.	Dec. 21.
12 noon.	60° 73° 67° 90°	57° 70° 70° 87°	49° 62° 78° 79°	37° 50° 90° 67°	25° 38° 78° 55°	17° 30° 70° 47°	14° 27° 67° 44°
11 A.M., 1 P.M.	58° 69° 62° 76°	54° 65° 65° 75°	46° 58° 70° 71°	35° 47° 75° 62°	23° 35° 70° 52°	15° 27° 65° 43°	13° 24° 62° 41°
10 ,, 2 ,,	52° 60° 52° 63°	49° 57° 54° 62°	41° 50° 57° 59°	31° 41° 60° 52°	20° 30° 57° 44°	12° 23° 54° 37°	9° 20° 52° 34°
9 ,, 3 ,,	45° 49° 40° 49°	41° 46° 41° 48°	35° 41° 43° 45°	24° 32° 45° 40°	14° 23° 43° 33°	7° 16° 41° 28°	4° 14° 40° 25°
8 ,, 4 ,,	37° 38° 27° 36°	33° 35° 27° 34°	27° 30° 28° 31°	17° 22° 30° 27°	7° 13° 28° 21°	0° 8° 27° 17°	5° 15° 27° 15°
7 ,, 5 ,,	27° 26° 14° 22°	24° 24° 14° 21°	18° 19° 14° 17	9° 11° 15° 13°	3° 7° 14° 7°	4° 14°	3° 14°
6 ,, 6 ,,	18° 15° 0° 7°	15° 12° 0° 6°	8° 7° 0° 3°	0° 0° 0° 0°	0° 0°	0°	0°
5 ,, 7 ,,	10° 4°	7° 2°	0°	0°	0°	0°	0°
4 ,, 8 ,,	2°	0°	0°	0°	0°	0°	0°
Latitudes South 53° 40° 0° 23°	Dec. 21.	Jan. 20. Nov. 21.	Feb. 20. Oct. 21.	Mar. 22. Sept. 21.	April 21. Aug. 21.	May 22. July 22.	June 21.

F. B. Taylor.

ON THINGS IN GENERAL.

When we had not arrived so near to the *fin de siècle*—an expression which seems almost misapplied when not used as adjectival slang—it used to be the proper thing to speak of a "burning question;" but the "new journalism" would require something more piquant. As, however, I do not claim to be a new journalist, I will—whatever the risk to my reputation—say that the burning question of the day among photographers is, "Gelatine or collodion for printing papers?" The heat evolved in the discussion is, indeed, of a burning character, and I only hope I may not be involved in a general conflagration if I add my share of fuel. Albumen holds its own bravely; but there is not a doubt that it is being hardly pressed, and in the near future will feel the press still more closely. With P.O.P. or C.C.P. at only twenty per cent. in price above that of ready-sensitised albumenised paper, the question of £ *s. d.* hardly steps in. It is all a question of results—results only, I was about to write, but that would not be correct—results, and ease or difficulty in obtaining them would more correctly put the state of affairs. It appears to me that the latter point is made too much of. My view of the matter is that for "professionals," the more difficult a process is to work, so long as its results are the best obtainable, the better it should be for him, if he is worth his salt. What is his training worth unless it enables him to overcome difficulties that are one too many for the occasional amateur? It is the very simplicity that processes have been brought to that is in danger of damning "the craft" entirely. But, to return to the materials themselves, I may say I have derived pleasure and instruction from the use of the new papers. I should never dream of being without them; but equally strongly

am I in favour of retaining the use of albumen. All are good in their way; what we want to do is to learn all about their little ways, and use one or the other as our knowledge tells us may be needful. I confess to a strong sympathy with C.C.P.—it is the paper of the future; the delightful cracks it is sometimes given to exhibiting just come within that category of difficulties which I have suggested the professional would be proud to meet. One worker objects to its tender surface, and says the prints in an album will be injured by rubbing against one another. Did he ever see a couple of albumen prints that would not quickly spoil in an identical manner?

All this recent discussion reads very like a chapter out of the journals of a dozen years ago, when "collodion or gelatine" was a question applied to negative matters only.

We then had *ad nauseam* an expression that I once suggested the printers should keep stereotyped, so often was it made use of—"the old love," as applied to wet collodion. The present generation of photographers know about as much of this expression as they do of the process it referred to. For general work it would be like a nightmare to go back to the wet-collodion process; but what negatives we got in those days! How different from the usual washy things of to-day, and what prints they gave after, perhaps, two or three hours' printing in the sun!

If we still produced the same type of image now, P.O.P. and C.C. would scarcely be looked at; and yet, strange event, only last week I saw in these pages a review of a new manual upon the wet-collodion process. I rubbed my eyes, to be sure I was not dreaming. It is true the manual is mainly intended for process workers, but that, in face of the multitude of old works on the subject, there should be still room for another is simply marvellous.

There is nothing new under the sun, hence I suppose this new book will be as new as any. So with the process of dry mounting, the invention which I saw ascribed to the genius of our good friend Mr. Cowan, the other day. It is difficult to say who did invent it; but I do know I saw it in operation close upon thirty years ago at Disderi's place, in Brompton, and I know it was in regular use at a once famous establishment in Cambridge, much more than a dozen years ago. By the bye, it is a very good method, and it is matter for surprise that so few avail themselves of it. It is simple, easy, quick, and gives prints that lie beautifully flat and even. If those who have not yet given it a fair trial would only do so, they would not go back to wet mounting any more than they would to wet collodion, save Mr. Gamble's presence, excepting for process work. By the way, I wonder if in the new manual the Editor's late tip about celluloid varnish being unsuitable for collodion negatives is given. I have seen a wet-plate negative spoiled by using this varnish, and it is well that attention has been called to the matter, as this particular varnish is growing in favour.

What is the meaning of all this harking back to old processes? This feverish desire to write up enamels is another instance. By all means let something be done to give a fillip to business, but it is very questionable if taking up enamels will do it. I write with an enamel beside me which was given to me by an old friend who has been dead about a quarter of a century, and who gave it me some years before he died, over thirty, I think, since it was done. Yet, wonderful as it was then considered, the process made no headway; it was never, except perhaps in one or two hands, a commercial success. Mr. Henderson, the photographic Palissy, was one of our most successful workers, he could tell whether he ever saw any approach to a fortune in it.

I referred to a "burning question" a few lines above this. Another of them is the separate or combined toning baths. We have good men on the track, but, so far, we don't get much beyond the results and deductions of Messrs. Davanne and Girard's classical work in the early days of the alkaline toning bath. Prints done thirty or forty years ago by the combined bath are, as is well known, still on view, as fresh-looking almost as on the day they were first produced. Why can we not now do all our prints in the combined bath, and so that they will not fade? I am an out-and-out advocate of the single toning alkaline, followed by hypo, but I have a shrewd suspicion that the faded prints by the combined bath are only those (no doubt, they constitute the vast majority) which have been treated by an old bath, one in which the fixing qualities have been reduced to about *nil*. What strengthens me in this idea is the remembrance (and here all photographers will bear me out) that nearly, if not quite all, the old prints used to be yellow in the whites, a sure sign that the solution had decomposed and almost lost its powers of fixing.

What a number of papers have got hold of the story of the photographic editor who hinted to his readers the desirability of going out with a rod and line when starting a photographic trip by railway, and so travel half price. Well, it would certainly not be a very honourable mode of getting a free ticket, and we will hope it was only meant as a joke.

FREE LANCE.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

IX.—PHOTOGRAPHING SHIPS' CABINS.

IN my last I referred to the photographing of such interiors as bonded stores and similar subjects, where not a ray of daylight ever enters, and described the manner of lighting the same by means of artificial light.

Another class of interiors that frequently have to be photographed, for the purpose of being illustrated in advertisements, is ships' cabins or saloons, and among the floating palaces of the present day some very large and important subjects of this class are met with, in hardly any two instances of which will similar conditions of lighting, size, or shape, be found to agree.

As to size, it will be found that in the case of many of the newer class of steamships the extreme width of the saloons will often tax the energies of a photographer to no small extent, and require the employment of lenses of very wide angle to even get anything like a fair proportion of the view on to the plate, for, when dealing with such subjects as dining saloons on board any of the modern Atlantic greyhounds, the great point is to be able to show the saloon to its full extent, so as in no way to detract from its general appearance by dwarfing the same, or the merely taking a part or corner of it. To accomplish this is always a matter of the greatest difficulty, and not infrequently impossible.

Then, again, in contradistinction to this, an operator has often to squeeze himself and his camera away into holes and corners for the purpose of securing some desired "bit," which has to be taken at very close quarters, and in which special provision has to be made for supporting the camera, the employment of ordinary tripods being quite out of the question in such places.

As a rule, even when dealing with any of the sumptuous dining saloons of American liners, the lighting is always deficient; in nearly every instance will it be found that, in addition to the ordinary side lights, one, or perhaps two, borrowed top lights will be the extent of the source of illumination, and in the case of the latter it is almost certain to cause trouble from halation, provided special precautions are not taken to guard against the same, for these light patches of lighting in the midst of such dark or sombre surroundings are very much over-exposed by the time anything like a sufficient exposure is got on the plate from the darker parts of the saloon.

I have lately had a good deal of practical experience at this kind of work, and by employing a specially-backed plate, in conjunction with another little well-known dodge, which I shall describe later on, have been able to entirely overcome the evils from this excess of solarisation, arising from these brightly lighted places in the middle of dark interiors.

The first difficulty, however, to overcome is the getting of as much as possible of the view on to the plate; and, as I have said, this means the employment of very wide-angle lenses, and having got the same, the being able to take it all out them, or, in other words, to so use them in conjunction with a plate very much larger in size than they are intended to cover, and then, by stopping them down to their utmost, just let the plate rip long enough to get a well-exposed negative; by this means the utmost covering capacity of the lens is utilised, and, if the larger-sized plate is not fully covered to its edges, as much as is found serviceable is printed from it.

In practice I have often used a range of lenses from half-plate wide angles up to eight and nine and a half inches focus, and this on plates fifteen by twelve inches, and, even with the modest little half-plate wide angle well stopped down, it is wonderful what an amount of space the same will cover and throw sharp on to a big plate. Of course, in using these lenses, the utmost care must be taken to avoid exaggerated foregrounds, the getting as far back as possible being the principal point to attend to.

No doubt, there are many such interiors, on the other hand, that in point of shape and size quite lend themselves to the purposes of photography, such as the long, tapering dining saloons on board

several of the well-appointed line of steamers employed in the home or coasting passenger trade. As a rule, these saloons are lavishly furnished and decorated, and not infrequently upholstered in dark maroon or scarlet velvet, a colour that photographs badly and necessitates an enormous amount of time in exposure. One of the finest examples of such is found on board the world-renowned *Columba*, belonging to Mr. David MacBrayne, and which is so popular with tourists from every part of the globe. In the case of the *Columba*, not only is the dining saloon most lavishly furnished, but at all times the tables are exquisitely decorated with the latest novelties in the way of table ornaments.

To photograph such a subject so as to convey any other impression but that of these tables being laid only for dining purposes would obviously be of no value as a commercial or even ordinary picture; and, of course, this means the extreme of contrasts brought about by the dark maroon upholstery, on the one hand, and the spotless white napery and tablecloths on the other, not to speak of the glittering display of silver and glass utensils which are laid out upon the tables, all of which go to make up a *tout-ensemble* of great beauty.

Quite recently I have secured some exceedingly fine pictures of the *Columba's* saloons, and it may interest some of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY to know a little about the exposures such subjects took.

The lower, or dining, saloon, which is lighted only by side lights, and which is upholstered in maroon velvet, as described, strikes any one on first entering as being somewhat dark. After a time, however, the eye gets accustomed to the sudden change from the bright light on deck to the dull light of the saloon; but, for photographic purposes, it is very insufficient, and when employing a fast isochromatic plate and a mid-angle lens, nine and a half inch focus, stopped down to *f*-40 and employed on a 15 × 12 plate. An exposure was given from 7 p.m. till 5 p.m. the next day, and this in the month of July last. The tables were all laid out with white cloths, which gave some reflected light, but not a particle of halation from these or the windows is visible in the negative. The plate was backed with bitumen and chloriform, as described by me in a previous article. The white cloths came out delightfully soft in the print, care being taken not to use too much pyro in development.

In contrast to this dark subject the saloon overhead is brilliantly lighted with glass slide windows and top lights above, the photographing of which, when the windows are draped with scarlet curtains, only required thirty minutes under similar conditions of plate, stops, &c.

When speaking with some photographers anent working on board ship, and the giving of such long exposures, I have been invariably asked, But what about the movement of the vessel? Such work is always undertaken when the vessels are either at anchor or made fast to the quay, and at such time, of course, there is no vibration from the working of machinery. Of course, in all cases there will be more or less swinging or movement of the vessel during the exposure, caused by the flow and ebb of the tide, but a photographer will find he need give no heed or thought to this, for any ordinary amount of movement that is communicated to the ship will, of course, be given simultaneously to the camera, which is, for the time being, if properly fixed up, part and parcel of the vessel. In any case, no movement will be sufficient to cause any blur to the image when developed on the sensitive plate.

The great secret lies in having the camera well and securely fixed in such a manner that any lurch does not cause it to occupy a different position to that first selected. If this is attended to at the outset, there need be no fear of any blurring of the image.

I hardly ever work twice alike in the matter of employing tripods in interior working. More often than anything, I use a good square box firmly fixed on a table or some equally firm support.

Another question I am often asked: But what about the people that are moving up and down and in and out during these long exposures? Of course, a time should be selected that will permit of the least possible amount of intrusion by those requiring to pass in front of the lens, but all that is necessary in such cases is to stand by the camera, and if any one wants to go into the field of view, or, in other words, in front of the camera, the mere capping of the lens is all that is required during the short time occupied by any one having business to transact. Of course, in instances where such long exposures as days and nights are required, arrangements must be made for the premises being shut off for the time being.

In exposures, however, in such places where people have to come and go, a quick eye and constant attention will soon observe when any intruder puts in an appearance, then on goes the cap, and as soon as possible off again, time being allowed for these stoppages.

There are some deck views which, properly speaking, come under the category of dark interiors, being, as they are, covered up overhead, although open at the ends. These are somewhat difficult of accomplishment also.

T. N. ARMSTRONG.

PHOTO-MICROGRAPHY AT THE ANTIPODES.

BEFORE the members of the South Australian Photographic Society, at the May meeting, a lecture on *Photo-micrography* was delivered by Mr. W. B. Poole. Photo-micrography was defined as the process by which the enlarged image of an object, as seen through the microscope, was permanently impressed upon a light sensitive surface. After referring to the efforts of early students in this branch of photographic work, and the difficulties with which they had to contend on account of their imperfect instruments and lack of suitable chemicals, a brief account of the progress made during the last few years was given. The advent of the collodion emulsion process gave a great impetus to the work, but it was not until the introduction of the gelatino-bromide dry plate that reliable and comparatively inexpensive reproductions of microscopic objects could be secured. The advance of microscopic optics during the last few years had also tended to lessen great difficulties, for whereas in the old days it was almost impossible to obtain lenses having coincident, visual, and actinic foci, now special glass is employed in the manufacture of the best lenses, which enables the optician to turn out an article which is almost perfect in its resolving and defining powers, being so corrected that the visual and actinic foci are practically at the same point. By the aid of the instruments in use at the present time, rapid and satisfactory images of almost any object can be obtained, and which for accuracy of detail leave any method of artistic representation through the medium of the hand and eye far behind. The lecturer dealt at length with the advantages which the photographs possess over drawings executed by hand, and showed how immensely superior the former were even when compared with the best work of the most skilled artists. Nearly every class of natural objects yields specimens worthy of reproduction, and during the last year or two that very difficult group—bacteria—had received great attention. As instancing the importance of photo-micrography, it was mentioned that it was only by its aid that bacilli could be truthfully depicted, the sensitive plates recording flagella on some of these forms that were too delicate to be perceived by the eye, even when aided by the best lenses. Other advantages claimed for the photographs were that they could be cheaply enlarged and reproduced in large quantities, and that they afforded data for measuring exactly the size of minute objects. After pointing out that, in order to be a successful photo-micrographer, the operator must have a complete knowledge of and command over his instruments, the lecturer proceeded to describe the apparatus used by himself. While showing and explaining each part in detail, Mr. Poole made a number of suggestions which should prove very useful to any one taking up this branch of study. The instrument was then set in position, and after determining the magnification and deciding on the objectives to be used, the light was adjusted and centred, and the camera coupled on to the microscope. A microscopic object—the spine of the echinus—was then placed on the carrier, and after being carefully focussed on to the screen, was exposed to a sensitive plate for a couple of minutes. The developing of the plate, which gave a clear, vigorous negative, brought the lecture to a close. On the motion of the President, a hearty vote of thanks was accorded Mr. Poole for his interesting lecture and demonstration.

THE SPECTROSCOPE.

[Knowledge.]

WHEN sunlight passes through a prism or wedge-shaped piece of transparent substance, it is bent out of its course; and if the source of light is a narrow slit—for example, if the light from the sun is made to pass through a small opening in a shutter—the beam of light is spread out after passing through the prism, and, if it is received on a screen, the image of the slit will consist of a broad band of various colours, red at one end and blue or violet at the other. This bright and many-hued strip is the solar spectrum, and its origin is due to the fact that the amount of bending or refraction which takes place on the passage of light through a prism depends on the colour of the light. Blue light is more refrangible than red, *i.e.*, it is farther bent from its original course, and therefore shines on a different part of the screen from that which is illuminated by the red rays. The splitting up of the rays which occurs on the transmission of light through a prism shows that white light is of a composite nature—that is to say, it is made up of rays which differ in colour and refrangibility.

If sunlight be admitted through a small hole in a shutter, so as to fall on a prism placed with its refracting edge horizontal and its base uppermost, the light will be refracted and bent upwards, and may be received on a screen placed at a distance. Now, if the prism is gradually turned round an axis passing through the centre of the prism, and parallel to the refracting edge, so that the coloured spectrum produced is more and more bent downwards, and moves down the screen as the prism is turned, it will be found that at a certain point in the rotation the spectrum

becomes stationary, and, on continuing the rotation of the prism in the same direction, the image begins to ascend and gets higher and higher on the screen. The position of the prism, when, after descending, the coloured image of the sun turns and begins to go upward, is called the position of *minimum deviation*. For that particular position the rays are least deviated from their original course, and they make equal angles with the faces of the prism at incidence and at emergence—in other words, the rays pass symmetrically through the prism.

That white light is made up of rays of different colour and refrangibility was first proved by Sir Isaac Newton. He also showed that lights which differ in colour differ also in refrangibility. By painting an oblong piece of black paper with red on one half and blue on the other, and then viewing the paper when thus coloured through a prism, he found that the light reflected from the blue half was more refracted than that from the red. Placing the paper opposite a window, and looking at it through a prism with its refracting angle downwards, so that the rays were bent upwards, he observed that the blue was lifted higher than the red. When the angle of the prism was pointed upwards, the rays were deflected downwards, and the blue were bent lower than the red. In both positions the light from the blue half of the paper was more refracted than that from the red.

The prismatic spectrum is now observed and investigated by means of the spectroscope. Light is allowed to fall on a narrow slit placed at the end of a telescope tube, at the other end of the tube an achromatic lens is fixed at a distance from the slit which is equal to its focal length, so that when the light leaves the lens it consists of a bundle of parallel rays. This part of the apparatus is called a collimator. On a movable horizontal table a prism is placed, and the parallel rays from the collimator are made to fall upon it. They are thus refracted and are then observed through a telescope. The sprectrum is brought to a focus by the object-glass of the observing telescope, and is then viewed through the eyepiece. Both the collimator and the telescope are attached to a graduated circle, and the telescope is capable of motion round this; it can be fixed in any desired position, and this position can then be read off on verniers attached to the telescope and moving round on the graduated circle. The spreading out of a beam of light into a coloured band, owing to the varying refrangibilities of the component rays, is called dispersion. As in the spectroscope the rays leave the collimator parallel to each other, they are dispersed in the prism, and on leaving the prism there is a beam of red light with a beam of blue light at a distance from it, the red rays being parallel to each other, though inclined to the blue. The yellow and green rays come between, the rays of each colour being parallel amongst themselves. The red rays are thus brought to a focus by the observing telescope at a definite point, and the blue rays at a neighbouring but different point. Thus a pure spectrum may be obtained —that is, one in which the different colours do not overlap. The position of minimum deviation is found in this instrument by turning the prism round by moving its stand till the light is less and less deviated, and following it round with the telescope, when at length a position is reached in which, on further movement of the prism, the image of the spectrum in the telescope begins to move in the opposite direction. This is the position of minimum deviation, and any motion of the prism in either direction will increase the deviation. The telescope is now clamped in its position and the reading of the vernier on the graduated circle taken. The direct reading of the slit is taken by turning the telescope to view it when the intervening prism is removed. The difference between this last reading and the former is the angle of minimum deviation. Observations are generally made with the prism in the minimum deviation position, for this position is a readily recoverable one, and observations at different times and in different instruments can then be compared with each other.

The distance between the red end and the violet end of the spectrum is called the dispersion, and this depends on the nature of the material forming the prism. The amount of minimum deviation for a given ray depends on the index of refraction of the material of the prism

When monochromatic light is used to illuminate the slit—for example, the yellow light given out by a spirit lamp with a salted wick, or by a Bunsen burner in which a lump of salt is heated—instead of a wide coloured spectrum, a narrow image of the slit is obtained, of one colour only, which would be yellow in the above instance. By observing the minimum deviation in this case we obtain its value for certain yellow rays, and, when a prism of another substance is employed, a different deviation for these same rays is got, and hence, when the angles of the prisms are known, the indices of refraction of the different substances can be compared. The refraction caused in light when it passes through a prism is due to the difference of the velocity of light through air, and through the substance of the transparent medium forming the prism. If this medium consists of a block with parallel faces, and the light falls perpendicularly upon it, retardation merely ensues, the light proceeding in the same line after passing through as before, but if the light falls obliquely it is bent in the transparent slab at an angle to its first direction, and on passing out proceeds in a line parallel with its original direction, but displaced through a certain distance, depending on the thickness and the refracting power of the slab. When the refracting substance has faces inclined at an angle, bending of the rays occurs both on entering and leaving it, and we have the phenomena observed with prisms. It is the rays which have the shortest wave-length whose velocity is most altered in the prism; these are the rays of violet light. Thus violet light is most retarded—that is, it is the most refrangible, its rays being the furthest deflected from their original direction. Of the rays forming the visible spectrum, those possessing the longest wave-length and forming red light are the least bent. It is pretty certain that the velocity of all the rays from the violet to the red is the same in the free ether of space. Now, the velocity is equal to the product of the frequency (or the number of vibrations per second) and the wave-length; therefore these two quantities, which remain unaltered during the passage of light through space, change, one or both of them on the passage of the light through dense matter. As the vibration in the transparent medium is excited by that in the incident light, its period is likely to be the same, so that it is probably the wave-length and not the frequency which changes as the light passes through the prism. Experiment shows that the wave-length of red light at one end of the visible spectrum is about twice as great as that of violet light at the other. The range of the vibrations to which our eyes are sensitive is thus about an octave. The red waves go through nearly four hundred millions of millions of vibrations per second, while the violet vibrate about seven hundred and sixty million million times per second—that is, about twice as fast. J. J. Stewart B.A.

Our Editorial Table.

Convention Photographs.

Mr. F. W. Hindley sends us a selection of prints from snap-shots he took during Convention week. These are chiefly groups of well-known men, and, besides being *per se* interesting, are clever examples of hand-camera work, a branch of photography in which Mr. Hindley is an expert. We remember that, at the evening lantern displays at Shrewsbury, Mr. Hindley's contributions illustrative of former Conventions were, by general consent, adjudged the best that were shown.

Yet another reminiscence of the Shrewsbury Convention reaches us from Mr. T. A. Scotton, of Derby. This assumes the form of a print from the negative of a group, including a large number of members, which that gentleman took on the occasion of the excursion to Church Stretton. The picture is excellently defined and exposed, and, besides its photographic good qualities, is of distinct interest by reason of the many photographers, whose names are "household words," it portrays. In after-years we do not doubt that these and similar photographs will be of considerable historical value.

Messrs. G. Houghton & Son's 1895 Catalogue.

Messrs. Houghton, of 89, High Holborn, have sent us a copy of their 1895 catalogue. This extends to close on 400 pages, and is a handsome, well-printed volume of a most comprehensive kind. To indicate in detail the articles of photographic use which it describes, prices, and illustrates, would be superfluous; suffice it to say that Messrs. Houghton's catalogue simply epitomises every requirement of the professional and amateur photographer.

Primus Stereoscopic Attachment.

This attachment, which must by the centre be attached to the head of the camera stand, enables stereoscopic views of still life to be taken by means of any ordinary single camera. It consists, as shown, of a plain piece of wood with central and side perforations. The directions for using it are:—



Fix the attachment to the tripod head parallel with the view to be taken in the place usually occupied by the camera; now screw the camera into either of the slots at the ends of the attachment, and after focussing take the first negative. Without moving camera stand, transfer camera to opposite slot, and expose another plate to the same view.

The makers are W. Butcher & Son, Blackheath, S.E.

The Convention Group.

By James Laing, Shrewsbury.

Those who have formed their ideas of what the Shrewsbury Convention group is like from the more or less miserable productions that have appeared in print in the serials, have no conception at all of the "real" article as turned out from the Art galleries of Mr. James Laing, and which is executed in the finest style of photo-

graphic art. In it every face is a study, which, for sharpness and chiaroscuro, will bear prolonged examination. The dimensions of this fine picture are fifteen by ten inches, the mount being nineteen by fifteen inches. It is, therefore, well adapted for framing. It is beautifully printed in platinum.

Christmas Mounts.

Messrs. Marion & Co., Soho-square, have sent us a few specimens of their new photo mounts for Christmas and other seasons. From an accompanying list we perceive that the selection is extremely extensive. This enterprising firm informs us that the demand for these season cards has become most extensive. The public seem to appreciate kindly greetings accompanied by a portrait of the sender or a view of his residence. These mounts are very elegantly embossed.

Views taken at Haddon Hall.

Mr. W. Barry, of Hull, who formed one of the party of the National Association of Professional Photographers on the occasion of a recent excursion to the classic grounds of Haddon Hall, has brought home several pictorial reminiscences of the pleasant outing. Need it be said that, by an artist of Mr. Barry's reputation, they are all excellent. Especially attractive are the groups of some of the members and their lady friends, the old wide stair at the hall lending itself admirably to the grouping.

News and Notes.

Mr. A. West, of Southsea, starts for America at the end of this month to take a series of photographs of the race between *Valkyrie III.* and the American yacht *Defender*. A special tug has been placed at his disposal, so that, no doubt, he will obtain some very fine pictures of this exciting contest.

Our Paris correspondent tells an interesting story of a triumph of instantaneous photography which has been accomplished at Aniche. It appears that, at the moment when M. Vuillemin was leaving the church after the celebration of his jubilee, a local amateur took the scene, including a figure in the corner apparently drawing something from his pocket, which is probably the would-be assassin, Decout, who a moment or two afterwards was the victim of the bomb intended for others.—*Daily Chronicle.*

The September issue of *The Artist* (A. Constable & C., 14, Parliament-street, S.W.) will be mainly devoted to a record and review of the National Competition of Schools of Art, and the Exhibition of the successful drawings, now being held at South Kensington. As this Exhibition represents the year's work of 269 schools of art, 359 science schools, and 426 art classes, it affords the only opportunity which the public has of seeing the year's work done in connexion with the Department of Science and Art. The important illustrated review of the *Artist* should therefore be of considerable interest to all art students, manufacturers, and the general public.

Chicago Exhibition, 1893.—The President of the United States has issued, under the authority of a Special Act of Congress, a complimentary diploma to the Commissioners of the countries which took part in the Chicago Exhibition of 1893. The representatives of Great Britain who have received these diplomas, which acknowledge "the grateful appreciation of the Government and people of the United States of America for their valued participation" in the Exhibition, are Sir Richard Webster and Sir Henry Trueman Wood, the Chairman and Secretary of the Royal Commission. The diploma bears the Seal of the United States, and is signed by Mr. Grover Cleveland, the President, and by the late Mr. Gresham, Secretary of State.

Death of Mr. R. Slingsby.—We are sorry to learn of the death of Mr. R. Slingsby, of Lincoln, which took place on Friday last, August 16. The deceased, who was fifty-six years old, had been unwell for some time, and succumbed to the effects of an attack of pneumonia. In about the year 1860 he commenced business as a photographer at Lincoln. He was at one time a frequent, prominent, and successful exhibitor at the principal photographic exhibitions, and devoted much attention to flashlight work, on which subject he had written a manual. Mr. Slingsby, whose premature end will be much regretted, was a Vice-President of the National Association of Professional Photographers, and was connected with other photographic bodies.

Trade Prices.—As far as the photographic profession is concerned, the hostile competition as to enlargements, manifest by the catalogues of certain of the dealers, remains an awkward and unpleasant fact. Legally, of course, dealers are entitled to conduct their business as they may think fit, and to compete with their customers if they choose, but it is probable they might reconsider the position if a strong representation of the views of the profession were made. To distribute material for photographic use has hitherto been he vogue of the dealers, but the new departure of supplying to the public nlargements complete at trade prices directly conflicts with the interests of he profession they affect to serve. It is a fit subject for the consideration of he National Association of Professional Photographers, and for concerted ction on the part of the trade.—*Autotype Notes.*

Photographic Glass.—Prior to 1872 the glass used for photographic purposes was technically called patent plate, and was made by Messrs. Chance Bros. & Co., Spon-lane, Birmingham, the selling price being 2*s.* 9*d.* per superficial foot. The high price naturally led to a substitute. This was brought out by Mr. J. A. Forrest, of Liverpool, and was produced at an average price of 1*s.* per superficial foot. He erected polishing machinery, and sold the glass under the name of "Forrest's Patent Plate Substitute." Its superior quality gave it a high popularity and demand from 1872 to 1887. Dr. Maddox's gelatine process made the plate opaque when sensitised as compared with collodion, hence quality was no longer of importance. Manufacturers of plates soon discovered that glass made in Belgium at half its cost superseded its sale; and now, in 1895, it rules supreme. English glass is made from sand containing *iron*, hence its green colour as compared with Belgian glass, made from sand free from iron; also English coal contains sulphur, whilst Belgian is flattened with charcoal free from sulphur. Consequently the development is not affected by the presence of any deleterious matter. Mr. J. A. Forrest was one of the first founders of The British Journal of Photography.

Amateur Photographic Association.—The annual meeting of the Council was held Tuesday, August 13, James Glaisher, Esq. (Vice-president), in the chair. The minutes of the last meeting having been read and confirmed, the Secretary laid before the meeting the pictures for the current year. The number of pictures contributed was less than usual, but in excellence they greatly exceeded the average. A series of 23×19 pictures, taken direct, by Mr. Milne of the Alhambra at Grenada, are quite exceptional. The definition in these is more like what one expects in a 10×8 picture. Some 15×12 landscapes and instantaneous pictures of sheep and breaking waves were considered the perfection of photography. The first prize, a large silver goblet, was awarded to R. O. Milne for Nos. 769A and 769E; and a landscape album for Nos. 73, 77, 575, and 563A. The flock of sheep, as regards light and shade and perfect definition, were greatly admired; and the 15×12 picture of "curling" on the ice is a most artistic group, and strikes one as something altogether new. The second prize, a silver goblet, was awarded to Mr. R. Leventhorpe for Nos. 251, 253, 255, and 256, which were greatly admired. A large silver medal was awarded to Mr. F. G. Smart for Nos. 77 and 79; a picture in frame to Mr. W. Jerome Harrison for Nos. 434, 435, and 1513; a portrait album to Mrs. Young for Nos. 4A and 5; a silver goblet to Mr. A. Dresser for Nos. 1 and 15; a landscape album to Mr. J. M. S. Walker for Nos. 5, 10, and 12; a medal to Mr. H. M. Studd for Nos. 3 and 5; and a medal to Mr. F. S. Schwabe for Nos. 5 and 13. His Grace the Archbishop of York was elected a Vice-President, and Colonel North a member of the Council. A vote of thanks was proposed by Mr. Wood, and passed by the meeting, to Mr. Glaisher for the time and care he had given to the arrangement and classification of the pictures. The pictures are now on view at 58, Pall-mall.

Notes on the Toning of Solio with the Sulphocyanide Bath.—Of the various toning baths, both separate and combined, which can be employed with Solio, the one which, under suitable conditions, perhaps, gives the most beautiful and most *permanent* results is the sulphocyanide bath, either with or without the addition of sodium acetate. The latter is recommended in our issued instructions, and, when toning to the cold grey stage with this bath, the addition of the acetate tends to give a somewhat bluer tint to the prints than is the case when it is omitted. Omitting the acetate, however, makes very little difference, and those who prefer a simpler bath will find that equally excellent results can be obtained with the following baths:—

	A.	X.
* Stock solution	Gold chloride ... 15 grains.	15 grains.
	Water up to ..... 16 ounces.	2 ounces.
	B.	**Y.**
Stock solution	Amm. sulphocy. 150 grains.	150 grains.
	Water up to ..... 16 ounces.	2 ounces.
For use pour A	1 ounce	Of X pour 1 drachm into 5 ounces water; of Y 1 drachm into 5 ounces water; pour the diluted X solution into the diluted Y solution.
into B	1 ,,	
Make up with water to 2 gallons.		

As soon as the bath has changed from a yellow colour to a water white, it is fit for use. *Method of Toning.*—Wash the prints well in cold water, soak in an alum bath—alum, ½ ounce; water, 20 ounces—wash again for a few minutes, and then tone to the desired colour, judging by transmitted light, and remembering that, when dry, the prints always look colder than when wet (ignore the surface colour), wash well for a few minutes in the following bath: Hypo, 3 ounces; soda sulphite, 1½ ounces; water, 20 ounces. Finally wash well for one hour in running water. We have found, by long experience, that the salt, recommended in our printed instructions, is best omitted when toning with the sulphocyanide bath, though its use when toning with an acetate or a platinum bath is of importance, as, without it, toning continues vigorously for some time in the wash water with these baths.—*Kodak News.*

RECENT PATENTS.

APPLICATION FOR PATENT.

No. 15,220.—"Improvements in Photographic Magazine Cameras." J. N. Wigle.—*Dated August*, 1895.

* We recommend gold chloride containing 7 grains gold to 15 grains of gold chloride.

PATENTS COMPLETED.

Improvements in Photographic Cameras.

No. 10,037.—Friedrich Haarstick, 34, Bolkerstrasse, Düsseldorf, Germany.—*June* 22, 1895.

This invention relates to that class of photographic cameras which, in addition to the ordinary camera adapted to receive the sensitised plate or film, contains also an auxiliary or focussing camera.

Hitherto it has been usual to connect the auxiliary camera rigidly with the principal camera, and the design was not, therefore, suitable for variable distances.

To avoid this defect, I connect the two cameras by a hinge, or other joint, which allows one camera to be turned relatively to the other, and provide a suitable device for securing them in the desired position.

The main camera and the auxiliary camera are mounted on separate plates, pivoted on a vertical hinge pin, situated near the front ends of the camera and between the same. The desired angular adjustment may be produced by means of a spindle with right and left-hand screw thread and a button, said spindle passing through a pair of screw nuts pivoted to a pair of lugs at the rear ends of the cameras.

The rear end of the main camera is adapted to receive the slide containing the sensitised plate or film, while the auxiliary camera has at its rear end a ground-glass plate, and, when in use, both cameras are directed on the same object. When the two cameras are in the desired position, and the sensitised plate or film has been inserted, the operator watches the image on the ground-glass plate of the auxiliary camera, and, when he is satisfied as regards the clearness and general appearance of the image, he acts on the instantaneous shutter or draws the slide so as to expose the sensitised surface of the main camera

My invention is applicable also to stereoscopic cameras, in which case the auxiliary camera is preferably mounted above the two main cameras.

In one design the angle between the optical axes of the two cameras is varied automatically by adjusting the cameras for various distances.

For this purpose the hinge pin or pivot connecting the two base plates, is mounted on a toothed rack, which is guided in a straight line by a stationary bearing, and into which gears at the rear end a pinion. The two cameras, rendered extensible in the usual manner by means of flexible bags or other suitable means, are fixed in front of the base plates, while the rear end of each camera is adapted to slide on its plates, being guided by a pair of flanges or ledges parallel to the optical axis, and also by a stud fitting into a slot of the base plate.

In order that the rear part of the camera may retain its position while the plates, together with the front of the camera, are being drawn forward and backward, the bolts extend through transverse slots of the main frame or base which supports both cameras, said slots permitting only a lateral motion. If the plates are drawn back, they impart this motion to the camera fronts fixed on the same, but not to the rear ends of the cameras, which are retained by the studs extending through the cross slots of the main frame.

To provide that the plates will move apart at the back when they are being drawn forward, and that they will approach each other at the back when they are drawn backward, the main frame has incline slots, in which are guided the pins fixed to the plates.

If the plates are withdrawn so as to reduce the length of the cameras as far as possible, the optical axes of the two cameras are almost parallel, but, where the plates, together with the camera fronts have been drawn forward as far as possible, the optical axes of the two cameras form a considerable angle.

The claims are:—1. In a photographic duplex camera the combination of a main camera with an auxiliary or focussing camera, and means for turning the said camera, so as to vary the angle between their optical axes, substantially as and for the purpose described. 2. In a photographic duplex camera, the combination of the main camera with an auxiliary or focussing camera, a rectilinear guided hinge joint connecting the front ends of the base plates and slots and pins, or equivalent transverse guides for the rear parts of the base plates, substantially as described. 3. In a duplex camera of the type described above, a pair of pins and slots or equivalent guides, which permit only a transverse motion of the cameras, substantially as described.

Apparatus to be Employed in Photographing Developments of Circular or other Surfaces not Visible from a Single Point of View.

No. 15,559. Arthur Hamilton Smith, Riverbank, Putney, London. *June* 22, 1895.

The object of my invention is to provide apparatus by means of which a photograph can be taken showing the whole or any desired part of the surfaces of cylindrical or other objects having surfaces not visible from a single point of view.

An apparatus constructed according to my invention consists of a slitted screen capable of being moved across the field of view of the lens of a camera, and of a support for the object to be photographed, which support is operated in such a manner that the object is caused to travel with the screen, and, at the same time, to have motion imparted to it in such a way that various portions of its surface, or of any desired part of its surface, are successively presented before the slit in the screen as it and the object are traversed in front of the camera. I do not limit myself to precise details, but a convenient arrangement for the purpose of photographing from objects with cylindrical surfaces consists of a blackened screen capable of being moved by a screw in guides situated transversely of the axis of the lens of the camera. The said screen is provided with a suitable hood and a cloth or the like extending from the screen to the camera. In the screen is a vertical slit, the side or sides of which can be moved and clamped so as to vary the width of the slit.

At the back of the screen is a frame, which can be rigidly connected with the parts constituting the groove supporting the screen. At the requisite distance from the screen, guides are fixed parallel with the screen, and between these guides is a disc, capable of rotation about its axis and of longitudinal motion between the guides. A short cylinder or pin stands concentrically on the disc, and above is a plate, in the centre of which rises a small pin. A hole passes through the axis of the cylinder, and a hole at a corresponding height passes through the screen immediately below the centre of the screen, and through these holes a rigid rod or lever passes, one end being free, and the other end being centered on a pivot, whose position can be adjusted.

A series of discs of various diameters, in accordance with the diameters of the objects to be photographed, are provided, they having holes in their centres to fit on the pin in the aforesaid plate.

At each side of the framework are clamps, capable of holding a cord at the height of the middle of the disc when placed on the pin, and capable of being fixed at any desired distance from the screen.

A disc of the same diameter as the cylinder to be photographed is placed on the pin, a cord is passed from a clamp round the disc, and thence to a second clamp. The cord preferably joins and leaves the circumference at the point nearest to the screen, and the whole is adjusted so that the cylinder is at the proper distance from the screen. The cylinder is placed on the wooden disc, so that the part which is to form the middle of the photograph is nearest to the screen when in the axis of the camera lens. The lever is pivoted below, but a short distance behind the optical centre of the lens when the camera is in position.

It will be obvious that, if the screen be moved to right or left, the lever causes the disc between the parallel guides to move therein so as to follow the screen, and also causes the disc, which is confined by the cord, to rotate to a corresponding extent together with the object placed on it.

The screen is now drawn aside until the part of the cylinder which it is wished shall be at one side of the picture is thrown upon the ground glass of the camera in its proper position.

The dark slide is now exposed, and by means of the screw the slit in the screen is made to travel across the field of view of the camera lens, and the object seen through it thus travels across the sensitive plate in the camera in the opposite direction. At the same time the lever, actuated by the screen, moves the disc between the parallel guides, and the revolution of the disc, actuated by the cord, causes successive portions of the circumference of the cylinder to present themselves to the lens through the slit as it assumes its successive positions, and thus the image of the surface of the cylinder is unwound or "developed," and photographed on the sensitive plate.

If it be desired to photograph a portion of a cone, the object may be tilted until the smaller circumference is vertically above one point, or, if there be two important points in the design, vertically above two points in the design. The size of the disc will be that of the circle which passes most nearly through the points of intersection, and near the important parts of the design. Parts of the design which fall outside the disc are compressed on the sensitised plate, and parts which fall within it are spread out. In arranging the compromise necessary for developing a figure other than a cylinder, it is necessary to consider the character of the design and the parts where accurate rendering is most desired.

If the surface of the object be spherical or spheroidal, it is advantageous to place the pivot on the opposite side of the screen beyond the object. The effect of this is that the smaller circumferences of the sphere are, for any given arc, spread out over a shorter distance than the principal circumference, while they are spread out over a longer distance than the principal circumference if the lever is pivoted below or behind the lens. I have described the application of my invention to the photographing of cylindrical or circular surfaces, but it is not restricted thereto, as it may be also applied to the photographing of developments of other surfaces, the mechanism by which the articles to be photographed is operated being so arranged that, as the screen moves across the field of view of the camera lens, and the article to be photographed is similarly moved, its surfaces are successively presented before the slit as hereinbefore described.

Improvements relating to the Manufacture of Photographic Printing Paper.

(Communicated from abroad by Arndt & Troost, 7, Wingertstrasse, Frankfort-on-the-Main, in the Empire of Germany, manufacturers.)

No. 20,358. Henry Harris Lake, 45, Southampton-buildings, Middlesex. *June* 29, 1895.

This invention relates to the manufacture of photographic printing paper.

At the present time there is no heliographic process with silver paper which operates without a special developing or fixing bath; only ferro prints have heretofore been developed in pure cold water by a single washing operation.

Besides the well-known compounds of silver salt, the improved paper contains also an iron compound, which, in this combination, performs a double function. In the first place, the compound of an iron salt and silver salt appears to be much more permanent than that of silver salts alone; and, in the second place, the iron salt, owing to its being reduced in the light, serves to precipitate silver from the silver salt, and thus produces the picture.

The primary material employed for the production of this improved paper is not paper which contains chlorine. Use is preferably made of pure rag paper, and also fabric for this purpose; the absence of wood is very desirable. These materials are soaked with a solution, which consists of silver nitrate, iron ammonia, tartaric acid, citric acid, and preferably also gelatine

It has been found that the tartaric acid or the citric acid may be dispensed with without giving rise to a very great difference. The same is the case with the gelatine. The quantity of the iron salts used determines the darkness in tone of the copies obtained.

The conditions under which these materials have heretofore been used and have given favourable results are for 1000 cubic centimetres of distilled waters, 80 to 100 grammes of iron ammonium citrate, 12 to 20 grammes of silver nitrate, 15 to 20 grammes of tartaric acid, and 10 to 15 grammes of gelatine. The paper soaked with this solution keeps unchanged for several months in the unexposed state. Exposed to the light it is five times more sensitive than the customary paper containing hydrocyanic acid; the parts exposed to the light receive a slightly yellowish colour, which, by the washing in pure water, changes to deep brown.

By reason of its very great sensitiveness, the improved paper may be employed in cases where such has not hitherto been possible, especially for printing on rather thick cardboard and for producing negative stencils, which may be used directly with the same paper, or with paper containing hydrocyanic acid for the production of positives. The copies thus obtained are quite unchangeable in the light after the washing, and do not require any further fixing.

According to what is known regarding the several components of the solution, two operations must take place for forming the copy. In the first place, a small part of the silver nitrate in the presence of the organic substances will be directly decomposed in the light and become coloured. In the second place, and this is evidently the more important operation for imparting colour, the iron oxide present is reduced by the exposure to light, in consequence of which metallic silver is then precipitated from the silver nitrate. The opinion that the two operations take place in conjunction appears to be supported by the brown colour of the product obtained.

Although the pictures produced with this improved paper keep very long, under ordinary circumstances it is advisable, in cases where the pictures are brought together with acids, or substances containing acids, to submit them to a fixing operation.

Claims :—1. Highly sensitive (permanent) silver paper for photographic printing purposes, produced by soaking the paper with a solution of silver nitrate and citric or tartaric ferric salt, whereby a light yellow tinted paper is obtained, which turns brown when exposed to the light, and becomes yellow again when moistened, and which, when treated in the fixing bath, turns dark brown. 2. For producing photographic printing paper, such as described in the first claim, the application of a solution, consisting of silver nitrate, citric ammonio-ferric sulphate, tartaric acid, and preferably also gelatine. 3. For producing photographic printing paper, such as described in the first claim, by using the solution stated in the second claim, a composition of said solution, containing 1000 cubic centimetres of distilled water, 80 to 100 grammes of citric ammonio-ferric sulphate, 12 to 20 grammes of silver nitrate, 15 to 20 grammes of tartaric acid, and 10 to 15 grammes of gelatine.

A New or Improved Reflector or Diffuser, principally applicable for Photographic Purposes.

No. 17,785. Frederick John Borland, 2, Sheepscar-grove, Benson-street, Leeds.—*July* 20, 1895.

According to my invention, I build the frame of a reflector or diffuser of flexible spokes, set radially in a disc or hub, which may serve at the same time as a support for a lamp. The said flexible spokes are curved over, and may be connected to a circular hoop. The framework thus assumes the form of an umbrella.

It is then covered with canvas or other suitable material, which may be coated with incombustible paint.

Improvements in Cameras.

No. 17,895.—Arthur Hood Mitchel-Jones, 29, Grove-road, Stockwell, London, S.W.—*July* 20, 1895.

My improvements refer to the hand or detective camera in combination with the ordinary camera as used on a stand or tripod. The camera body may be formed in the usual way with back, body, bellows front, &c.

The body being sufficiently long to entirely contain the bellows and front when partly closed and used as a hand camera, the front in this case also being made large enough to fit to the interior of the camera body. A smaller front may be provided when the camera is being used on the stand.

When used as a hand camera, the front is preferably fitted with two lenses, mounted stereoscopically, and a suitable division is placed longitudinally midway between such lenses. A suitable box is arranged to take the place of the ordinary dry back, such box forming a magazine containing the plates, films, &c. The magazine is also divided longitudinally to suit the divisions previously described with reference to the camera, &c. The upper portion contiguous to the camera body is provided with a suitably angled mirror which received the image from the top lens, and reflects it upon a ground-glass screen placed immediately over the mirror in the top of the magazine. The mirror is preferably made shorter than the width of the magazine, and the sides of the magazine between the mirror and camera made double to allow the travel of the plate receptacle hereafter described. The unexposed plates are preferably each placed in a separate carrier, the carriers dropping into a movable three-sided receptable at the back of the mirror, the top and bottom of the receptable being open to admit of the passage of the carriers, and the front being omitted to clear the mirror as the receptacle is moved forward.

The magazine immediately over this receptacle may be provided with suitable sliding door and groves for the attachment and manipulation of a changing box. The lower portion of the magazine is also fitted at the back with a similar receptacle to that previously described for receiving the exposed plates. The adjacent edges of the two receptacles are preferably formed as racks which gear into a common pinion operated from outside the box. It will be readily understood that with the charged top receptacle at the back of the magazine and the lower empty receptacle at the front, the pinion can be rotated so as to cause a plate from the top receptacle to come over a slot in the division between the receptacles, and so drop into the lower receptacle. This operation can be repeated till the whole of the plates previously in the top receptacle are contained in the lower one.

The lower side of the magazine may also be fitted with a slide and grooves for receiving and working a changing box, and the front of the magazine may by fitted with a slide for use when detaching the magazine from the camera. The changing box used in connexion with the magazine as hereinbefore described may consist of a box provided with a slide at one side and fitted with a suitable number of grooves to receive the carriers. The side of the box fitted with the slide is preferably arranged to slide into grooves or their equivalents on the magazine.

The changing operations will then be carried out by sliding the box on to the top of the magazine, opening the slide on the box and then opening the slide on the magazine, so that each carrier may be liberated singly if desired, and drop into the groves of the receptacles.

When the whole of the carriers with their plates are out of the box the slides are both closed, and the changing box is slid on to the bottom of the magazine, where, by opening the slide on the magazine and then the slide on the box, the carriers with the exposed plates can be allowed to drop singly into the box if desired, the two slides may then be closed and the box detached.

The view-finder screen may be fitted with the usual hinged hood, and the camera when used on the stand may have the division removed and be fitted with one lens only, which may take pictures of about twice the size of those obtained when the camera is used for taking stereoscopic pictures, or as a hand camera.

When film rolls are employed, the plate receptacles can be dispensed with.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

August.	Name of Society.	Subject.
26	North Middlesex	
26	Richmond	
27	Birmingham Photo. Society	
27	Hackney	
27	Halifax Camera Club	
27	Lancaster	
27	Leith	
27	Paisley	
27	Rochester	
27	Royal Photographic Society	
27	Warrington	
28	Burnley	
28	Croydon Camera Club	Excursion: Three Bridges for Horley. Leader, Mr. Wreford.—Photographic Chat, 8 p.m.
28	Leytonstone	
28	Newton Heath	*A Trip to Norway.* Mr. Winterbottom.
28	Photographic Club	
28	Southport	*Scientific Photography.* D. E. Benson.
29	Glossop Dale	
29	Halifax Photo. Club	
29	Hull	
29	Liverpool Amateur	
29	London and Provincial	Demonstration of the Collotype Process. W. T. Wilkinson.
29	Oldham	
30	Cardiff	
30	Croydon Microscopical	
30	Holborn	
30	Maidstone	
30	Swansea	
31	Hull	
31	Leytonstone	Excursion: Kew Gardens.
31	North Middlesex	Excursion: Syon Park and Gardens.
31	Oldham	Excursion: Oldham Wakes.

PHOTOGRAPHIC CLUB.

August 14,—Mr. L. J. Montefiore in the chair.

Mr. Foxlee passed round a stereo print—a portrait of the late Mr. S. Fry, taken by himself in 1857. Apart from the personal interest attached to it, it was interesting to know that it was mounted with gum on a bronze-printed mount, and had not faded abnormally.

The Chairman passed round several of his Convention pictures.

Mr. Foxlee next showed two illustrations of the action of potassium bichromate on the skin. It was generally agreed that it was a great blessing his hands were not in the same condition now.

Mr. Hodd showed comparative prints upon the two brands of Ilford P.O.P., Ordinary and Special. The negatives were also shown; also toned and untoned prints from same negatives. Summing up his remarks, he said the Special paper gave a greater range of colour. It prints very much quicker and is toned with less gold—one grain to a packet equals one and a half sheet. The Ordinary required three grains of gold per packet.

Several gentlemen suggested that Mr. Hodd would have got better results by using ordinary silver paper. It was also agreed that, according to the results shown by Mr. Hodd, the paper that was supposed to give a softer result, gave just the reverse.

Mr. Loman said that he always fixed first, washed afterwards, then toned and washed again for about fifteen minutes. He preferred the platinum bath, *i.e.*—

Potassium platinum chloride	15 grains.
Water	3½ pints.
Nitric acid	between 20 and 30 drops.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society took place at 36, George-street on Thursday, August 10.—Mr. H. M. Whitefield (the President) in the chair.

This meeting, and the previous one held in July, were devoted to receiving the results of experiments made by Messrs. Wolfenden, Edwards, and Casson.

to illustrate the covering power of various lenses suitable for hand-camera work, such as Wray's, Cooke's (Taylor's patent), and Goerz's, the foci of which were about five inches. Negatives and prints were exhibited to facilitate comparison.

The nomination paper, for the election of officers for the ensuing session, beginning in October, was laid on the table.

Hackney Photographic Society.—August 13, Mr. T. H. Smith presiding.—Members' work was shown by Messrs. A. Barker, Dean, Hensler, and Turtle. Mr. Dean showed results of toning P.O.P. with borax bath. The tone produced was very unpleasant. It was considered by some members present that the bath used had been too strong in borax. Mr. A. Barker said he had seen borax toned P.O.P. before, and had disliked the colour. Mr. Poulson had used the borax bath for gelatine chloride paper, and preferred it to sulphocyanide. Mr. W. L. Barker said that the essentials of a good tone must be sought farther back than the toning operation; to obtain a good tone a good negative must be used, and this implied correct exposure and development.

Leytonstone Camera Club.—On Saturday, August 10, samples of Gem Dry plates and Criterion P.O.P. were distributed to members present, and, in order to make a fair comparison of results, it was decided to fix an evening for this purpose in the September syllabus.

WEDNESDAY, AUGUST 14.—Members assembled in fair numbers to judge the prints taken during the July outings.

North Middlesex Photographic Society.—Monday, the 19th inst., was an Instruction Evening, when Mr. C. O. GREGORY read a paper, entitled *Some Aids to Improved Printing*. He brought up a lot of comparison prints, showing how various results were obtained by different methods of printing, such as shading weak parts while the denser portions printed out, using layers of tissue paper fastened to the printing frame, and also coating either the back of the negative or a supplemental sheet of glass with matt varnish, and then either scraping away those parts which it was desired to print deeper, or working with a blue or black pencil or water-colour on those portions it was desired to keep back. Vignetting also he dealt with, and recommended a piece of card with a hole cut roughly to the shape and size required and tissue paper round the edges to soften the outline. He proved, by the examples shown that, great improvement could be effected by a little simple dodging of this kind.

South London Photographic Society.—The last meeting of the Society was occupied as a Beginners' Night, Mr. G. H. Moss dealing with the subject of *Toning and Mounting*. He said tones are dependent upon the negative. Good results cannot be obtained from bad negatives. The washing of silver prints should proceed very rapidly, and the first water changed very quickly. Salt is sometimes recommended to be added to the washing water, which, I think, is advantageous, as it gets rid of all free silver. If prints are not thoroughly washed, they will not tone evenly, and the gold in the toning bath is likely to be precipitated. In my experience the best toning bath is the sulphocyanide. In judging the tone of gelatine prints look through them, but collodion paper prints must be judged while in the bath. Collodion prints become much bluer when dry. A weak toning bath does not give such good results as one stronger in gold. To prevent uneven tones use a toning bath once only. Allow one grain of gold for each sheet of paper toned. The acetate of soda bath I have found best for albumen prints. After toning prints they should be washed for five minutes, and then fixed in a one in ten fresh fixing bath. Wash then for one hour. I cannot recommend combined toning and fixing baths, one of which, I consider, contains an insufficient quantity of hypo to ensure fixing. For mounting prints, whether wet or dry, I recommend the use of freshly mixed starch.

FORTHCOMING EXHIBITIONS.

1895.		
Sept. 23	*Leeds.	G. Birkett, City Art Gallery, Leeds.
,, 23–28	*Westbourne Park Institute.	
,, 24	*Royal Cornwall Polytechnic Society.	Edward Kitto, The Observatory, Falmouth.
,, 30–Nov. 2	*Photographic Salon.	Alfred Maskell, Dudley Gallery, Piccadilly.
,, 30–Nov. 14	*Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
Oct. 28–Nov. 2	*Southport.	G. Cross, 15, Cambridge-arcade, Southport.
Nov. 19–21	*Hackney.	W. Fenton-Jones, 12, King Edward's-road Hackney.
,, 28–30	*Leytonstone.	B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ACTION OF FORMALIN UPON GELATINE.

To the EDITOR.

SIR,—Can you kindly tell me who discovered the action of formalin upon gelatine? Did the discovery originate with the patentees of its application to photographic purposes, and does their patent prevent one from using formalin as a preventive of "frilling?"—I am, yours, &c.,

SIDNEY A. STEVENS.

44, *Sarsfield-road, Balham, S.W., August* 20.

[The use of formalin for hardening gelatine was, we believe, discovered by a foreign microscopist, whose name we do not remember. The patent referred to is probably no barrier to the use of formalin by individual photographers.—ED.]

ALUMINIUM LENS MOUNTS AND CAMERA FITTINGS.

To the EDITOR.

SIR,—May I, through the medium of your columns, ask manufacturing opticians and dealers why the high price of aluminium mountings to lenses and cameras is maintained, in spite of the low price at which aluminium can be purchased?

I have before me as I write the price list of the British Aluminium Company, Limited, in which aluminium sheet and wire is quoted at 1*s.* 10*d.* to 2*s.* 1*d.* per *pound*, whilst the additional price asked for a lens with aluminium mountings is about 15*s.* per *ounce*. Now, aluminium is less than one-third the weight of brass (sp. gr., aluminium, 2·56; brass, 8·4), and, therefore, aluminium, at the above price, is as cheap as brass at 8*d.* per pound. I am aware that the soldering and working of aluminium involve some difficulties not experienced with brass; but, making every allowance for these, it does seem that fifty per cent. extra over and above the cost of a lens mounted in brass is "laying it on a little too thick."

Will some manufacturing optician and camera-maker kindly inform us how the excessive extra cost is arrived at, in face of the low price of aluminium? for, without such explanation, we are forced to the conclusion that it is simply a fancy price divided between maker and dealer, militating against the use of the metal, and against the sale of apparatus for photographic purposes, where weight is such a serious consideration.—I am, yours, &c.,

S. A. WARBURTON.

Leeds, August 20, 1895.

TRANSMISSION OF GAS CYLINDERS.

To the EDITOR.

SIR,—Your leader of last week and similar articles which have appeared in your contemporaries seem to have misconstrued the notices issued by the railway companies *re* carriage of compressed gases. I enclose you a copy of one, from which you will see the carriage by passenger train *is not prohibited*. On the contrary, the notice gives information how to send by passenger train, viz., by booking through the parcels office. Ordinary parcels rates are charged, and the cylinders travel in the goods van at the Company's risk. Lanternists wishing the cylinders to travel in the same train as they do should present them at the parcels office ten minutes before the train starts, with a form (one of which I also enclose) properly filled up.

The same regulation applies *to all lantern apparatus*, and thus the remedy you suggest is also *contra bonos mores*. The railway companies simply say that they will not accept these as *passengers' luggage to travel free*.

It is generally known that bicycles, perambulators, and many other articles are similarly prohibited from travelling free, and lanternists should find no more difficulty in booking their paraphernalia than with these articles.

As to the regulation being new, it has been pretty generally enforced in the Midlands for the last two years, and a printed notice specially prohibiting the carriage *as passengers' luggage* was shown by the Great Northern Railway at the time of the Bradford accident.

I venture to suggest that it would be of greater benefit to the users of compressed gases than the withdrawal of these regulations to obtain a specially reduced rate for their conveyance by passenger train. In our

district it is not an uncommon occurrence to find the goods department take *three weeks to deliver.*—I am, yours, &c.,

A. E. KNOWLES, *Manager.*

The Birmingham Oxygen Company, Limited, Saltley Works, Birmingham, August 14, 1895.

[Copy.]

"MIDLAND RAILWAY.

"Notice is hereby given that cylinders containing compressed gases will not be accepted for conveyance as passengers' luggage.

"Cylinders intended for conveyance by railway must be booked through the parcels or goods office at the stations. Particulars of the special conditions under which these cylinders are conveyed may be obtained at time of booking.

(Signed) "GEORGE H. TURNER, *General Manager.*

"*Derby, June*, 1895."

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

Alfred Freke, 12, Duke-street, Cardiff.—*Cabinet portrait of J. M. Maclean, M.P. for Cardiff.*

James Martyn, The Studio, Southwold, Suffolk.—*Portrait of Miss Dorothea Baird, standing with arms behind head; portrait of Miss Dorothea Baird, sitting.*

F. WHALEY.—Received; many thanks for the information.

J. WHITFIELD.—Received. We will pass on communication as desired.

J. P. CLARKE.—Lowtthime, Lamb's Conduit-street, London, will probably be able to supply you.

S. JONES.—The production of calcium carbide by Wilson's process has been patented in this country.

C. E. F.—The *Photographic Record* is published quarterly. It is the official organ of the Manchester Amateur Photographic Society.

J. MITCHELL.—It is probable that the toning of the sensitised albumen paper will be facilitated by subjecting it to ammonia fuming previous to printing it.

J. L. O.—The address of the Secretary of the Photographers' Copyright Union is H. D. Gower, London Chamber of Commerce, Botolph House, Eastcheap, E.C.

QUERIST.—Had you addressed your letter as we direct in every number, your query would have been answered. Read our directions, and, in future, please attend to them.

X. X. X.—To copy an object the size of the original with the lens you are employing, the camera will have to be extended not less than four feet seven inches, or twice the focus of the lens.

G. H. P. J.—Unless you employ a very thick layer of gelatine, there will be no chance of your obtaining such a degree of relief by swelling as you desire. You seem to have over-exposed to a considerable extent.

J. B. S. asks: "Would you kindly inform us where we can purchase baryta paper which is used for emulsion purposes?"—In reply: Communicate with Messrs. Otto König & Co., 27, Cross-street, Finsbury Pavement, E.C.

VELOX.—No name or address was given. You had better write to such firms as Morgan & Kidd, Richmond; Waterlow & Sons, Finsbury; or the London Stereoscopic Company, Cheapside, who would probably undertake the work.

REDUCTIO.—Yes; for the hypo in what is known as Farmer's reducer, you may substitute a solution of ammonium sulphocyanide, say five per cent., as recommended by Mr. Haddon. This will allow you to abbreviate the washing.

MARY TUILLER.—The photographs sent are, on the whole, very good. That with the boat in the foreground has the sky printed out too deeply. About three-quarters of an inch trimmed off the sky of the other would, we think, improve it.

D. S.—If the attention of the Lord Chamberlain is drawn to the circumstance that a photographer is describing himself as "Art photographer to the Queen" without a Royal warrant, no doubt, means will be found to check the misstatement.

WEIGHTS AND MEASURES.—The French "c. c." (cubic centimètre) equal seventeen minims, about; hence your error. See pages 859, 942, and 943 of the ALMANAC, where the French weights and measures and their English equivalents are given.

GAS says: "Will you tell me if the report of the Committee investigating the subject of the use of compressed gas in cylinders, appointed by the Home Secretary, has been issued, and where I can obtain a copy of it?"—The report has not yet been published.

EXHIBITOR.—Look under the heading of "Forthcoming Exhibitions" on another page, and you will see that no less than eight "open" Exhibitions are to be opened in the next month or two. Particulars of each may be obtained of the Secretaries, whose addresses are given.

J. G.—Presumably there is very little silver in the baths to be thrown down. Sulphide of potassium for waste fixing solution, and ferrous sulphate for gold solutions, are the precipitants usually employed, and we cannot recommend anything better. See article on another page.

STEREO-PHOTO.—1. Better work with a pair of lenses. All the devices you enumerate are useful and effective so far as they go, but for really practical purposes you will have to come to the binocular method. 2. The foreground centres are far too wide apart, being three and an eighth inches. Do not let them exceed two and seven-eighths.

J. ROBBINS.—The minute transparent markings in the negative are due to one of two causes, either (1) to the presence of dust on the film during exposure, or (2) between the plates when packed face to face after exposure. The slight abrasions visible favour the latter theory. In future be careful to dust your plates between each operation, before and subsequent to exposure.

ORTHO.—We have not had time to experiment in the direction indicated by the author of the paper; but we see no reason to depart from our previously expressed view, which is amply borne out by the experiences of practical men, that the use of a yellow screen with ordinary, or non-orthochromatised, plates simply lengthens the exposure, without in the slightest degree improving the colour-rendering.

VENICE says: "I bought in Venice some years ago views of Venice by moonlight. They are very fine, and seem to me to have been coated with some green substance to produce moonlight effect. Can you get sensitised paper that colour?"—In reply: A short time back green-tinted sensitised paper was an article of commerce, but we cannot say if it is now obtainable. Probably the prints referred to were printed on such a paper.

BOW WOW.—1. We are well acquainted with the No. 2 on your list, and think very highly of it. We work it with any form of condenser that happens to be in the lantern at the time. We have not examined the No. 1. 2. Better have a plain single lantern of the ordinary class. Chadwick makes a cheap lantern carrier which shuts off the light from the screen for one or two seconds during the act of changing. This, too, is a characteristic of Davenport's carrier, sold by J. H. Steward, of the Strand.

ROLLER-BURNISHER says: "Could you inform me where I can purchase a 'roller' burnisher for gelatine-chloride prints that used to be constantly advertised in your JOURNAL in two paragraphs every week. It is some months ago since the advertisement used to appear, and I forget the address where to send for one. They were described as just the thing for gelatine-chloride prints. Price, I think, about 21*s.*"—In reply: We believe the address is Wakeford, photographer, Sittingbourne.

J. SCOTT-BROWN says: "I have a 10×8 landscape negative which is much improved by the introduction of a figure. I find double printing very uncertain, and a great deal of trouble where large quantities are required. If I cut a space in the landscape negative (the size and shape of the figure), can I transfer the cut-out figures into that space? A photographer showed me a print where these means seem to have been employed, but he refuses to enlighten me on the subject. He regards it as a trade secret. Will you also tell me the best way to strip a film from the glass?"—The method you suggest will certainly answer quite well. Many landscapes with figures have been made in that way. Several articles have appeared in this JOURNAL on the subject, although not just of late. By immersing a negative in a highly dilute solution of hydrofluoric acid, the film will leave the glass.

CONTENTS.

	Page
FOCUSSING A LANTERN PROJECTION	529
GOLD IN PHOTOGRAPHY	529
RESIDUES FROM FIXING BATHS	530
JOTTINGS. By COSMOS	532
THE MOSELLE: A CONTINENTAL BY-WAY. By AN ITINERANT PHOTOGRAPHER	534
A NOTE ON EXPOSURE. By F. B. TAYLOR	535
ON THINGS IN GENERAL. By FREE LANCE	536
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—IX. By T. N. ARMSTRONG	537
PHOTO-MICROGRAPHY AT THE ANTIPODES	538
THE SPECTROSCOPE. By J. J. STEWART, B.A.	538
OUR EDITORIAL TABLE	539
NEWS AND NOTES	540
RECENT PATENTS	540
MEETINGS OF SOCIETIES	542
FORTHCOMING EXHIBITIONS	543
CORRESPONDENCE	543
ANSWERS TO CORRESPONDENTS	544

THE BRITISH

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THE ARRANGEMENT OF SUBJECT AND POINT OF SIGHT.

We have frequently animadverted upon the blunders and anachronisms perpetrated by "artists" in their arranging of groups intended to be historical, mainly in their placing of individuals, or perhaps allowing individuals to place themselves, in positions and assume attitudes totally at variance with the character and *raison-d'être* of the picture intended to be made, and have cited as examples of this mal-arrangement such works of art (?)—the otherwise magnificent engraving of *The Waterloo Banquet*, in which his Grace the Duke of Wellington, who presides, is on his legs making the speech of the evening, while the brilliant assemblage of noblemen and officers present, instead of paying him the compliment of even seeming to listen to what he is saying, are, in many instances, posed with their backs to the speaker, so as to show their faces either in full face, three-quarters, or profile, to the spectator.

Or, again, in another historical picture, *The Fight between Jem Mace and Tom Sayers*, a long-cherished adornment of the parlour walls of public-houses frequented by the "fancy," in which all the foreground patrons of the ring are depicted "standing for their portraits," and each striking his own individual attitude, the faces of all being turned to the artist, who is limning them, and their backs to the two pugilists who are dealing their deadly blows at each other.

Happily these perpetrations are few and far between, and the public are now becoming sufficiently educated to laugh at them, a fate which befell a recently reproduced cartoon representing a cricketing scene, in which a then famous batsman is represented in the act of delivering one of his enviable strokes to the accompaniment of the spectators in tall hats, staring, not at the expert, but at the sketcher.

Such outrages can but seldom be charged to the poor photographer, who has often quite enough to answer for in the way of bad posing, especially of groups, many individuals in which will persist in "striking an attitude," and showing his figure at its best, staring, of course, into the camera. This idea is one against which our Emersons and Robinsons might most fittingly and loudly declaim. A thousand times rather have the poorest efforts of the snap-shottist to represent such scenes than the studied poses of which we have made complaint.

Turning to a more pleasant theme, the selection of the best position from which to photograph scenes of every-day life, we cite for comment certain seaside sketches we have lately seen, and to which we have paid some attention. By seaside we here mean the everywhere present promenades and esplanades of our coast bathing resorts. Some of these are very attractive indeed, and never fail to bring the (domestic) house down when laid out for quiet examination by those who have been made familiar with their originals.

We have long been moderately well acquainted with some of the numerous places of this nature in the adjacent Isle of Wight, and have never failed to notice the difference between the snap-shot productions of the amateur and those of the professional seaside delineator, the latter being represented by Mr. F. N. Broderick, of whose success in this line we have previously had occasion to speak. The Broderick views, which are to be seen in nine-tenths of the shops in the island, have a peculiarity, contrasted with those of other photographers, of being taken from a loftier altitude, each individual on a crowded promenade being, as it were, picked out. But one day recently we saw a conveyance being driven along the esplanade at Sandown, and, watching developments, we soon perceived that the "cat was let out of the bag." The carriage was stopped, and in a trice a camera, mounted on a stand, eleven or twelve feet high, was planted in the middle of the numerous pedestrians by the artist himself, while in a few seconds more his assistant had brought from the vehicle a strong step ladder, up which Mr. Broderick mounted, the top of this ladder constituting a platform upon which he stood and manipulated the camera some five or six feet still higher, and holding in his hand the pneumatic ball on which to press at the auspicious moment. The ease and rapidity with which everything was done elicited our admiration. Too near or too inartistic objects in the immediate foreground were got rid of by the altitude of the point of sight, and hence there was no violent perspective, as must inevitably have been the case had an ordinary stand of five feet in height been used. We should say that the lens was between eleven and twelve feet above the ground. And yet the stand proper was only one of the usual height, but each leg was supplemented by a single one, which could be readily detached when ordinary views were required.

We have long advocated the use of taller stands than those generally employed, on the ground that the view of a place which will be most familiar to the observer is that which is obtained from a height approximating to that of the human eye, or a little over five feet from the ground. We have found,

by actual measurement, that most of the stands in the market fall short of fulfilling this requirement. Supplementary legs, to lengthen the normal ones, confer on the user a great power, which, although the mere dilettante photographer may not care to be troubled with them, cannot fail to be of great value to the professional landscapist. This suggests that the hand-camera man, whose average point of sight scarcely exceeds four feet from the ground, has insuperable difficulties to contend against when competing with the well-appointed local landscape professional, who, as in the case of Mr. Broderick, has every appliance at command, including portable dark room, to meet the exigencies of any case.

PROCESS BLOCKS AND THE ILLUSTRATED PRESS.

A FORTNIGHT back we directed attention to the existing state of photo-chromy from a purely practical or commercial point of view. We shall now say something in the same direction with regard to the present condition of process work in this country. This we do, for it is lamentable, to all interested in the progress of photography, to notice how rapidly half-tone photo blocks are being supplanted by engraved ones in the leading weekly illustrated papers, which only a little while ago used them almost exclusively for certain classes of illustrations. There must be some good reasons for this which it may be well, just now, to inquire into.

Cheapness is generally credited with being the cause of many radical changes, but that is not the case in the present instance, because engraved blocks are much more costly than photo blocks; also, engraved blocks require a longer time to produce than those made photographically, and expedition is of the greatest importance with the weekly or daily illustrated press. Therefore process blocks are not being "shunted," if not abandoned, on account of their taking a longer time for production, or for the reason that they are more costly, than hand-engraved ones. What, then, is the reason? It is, no doubt, because the results they yield are inferior to those given by engraved blocks used under the same conditions, and competition is now so keen between the rival high-class weeklies that they all vie with each other in the quality of their illustrations. Their publishers may well be credited with knowing full well what the general public, for whom they cater, most appreciate. Be all that as it may, the fact remains that process blocks are being fast superseded by engraved ones, as, at one time, the former did the latter; therefore it will be well to realise it at once and look at the matter fairly in the face.

It has sometimes been said that a photo block, even if inferior in quality, conveys to the general public a greater degree of truth than does an engraved one. But is that really the case? In the current number of one of the sixpenny weeklies are some three or four dozen portraits of members of the new Parliament, about half of which are from process blocks, the others being from line blocks. The majority of the former are very inferior, some being bare, or dirty in the lights, deficient in half-tone, and grey and mealy in the shadows. The whole of these prints are, more or less, what is technically termed "rotten." The line blocks are solid and vigorous, and are in striking contrast with the others. As regards the likenesses of the persons depicted, we unhesitatingly say that the process ones are certainly not superior in this respect to the line ones. This will be readily seen, because we have, most of us, become familiar with the features of the majority of those portrayed from the photographs of them shown in the shop windows and elsewhere, and from which the different blocks were produced.

Turning from portraits to process blocks from wash drawings, made specially for the purpose, we must confess that they are not equal to the line blocks of similar subjects. As a rule, they are flat and grey, and quite lacking the vigour and general effectiveness of the line work. Under these circumstances, it cannot be surprising that wood-engraving is rapidly coming, once more, to the front in the highest-class illustrated press. But whence comes the inferiority of these process-block impressions?

We say, unhesitatingly, that it is not in the process itself; also, that it is not that English block-makers cannot produce good blocks. One has only to go to the nearest railway bookstall to be convinced of that. There are now being published a series of portraits of noted cricketers, famous race horses, albums of views of places of interest, &c., all of which are printed from process blocks—though they are sometimes mistaken for collotypes—and anything finer than many of them are can scarcely be conceived in surface printing. What a contrast, however, are these to the process prints in some of the weekly illustrateds. These examples are sufficient to prove that the process is really capable of producing the finest results when properly handled, and this, manifestly, is not the case with some of the illustrated press. Clearly the printing, the ink, or the paper—or the whole combined—do not suit the half-tone blocks that are used.

The finer the block, the greater is the care and skill required in the printing, and the greater is the necessity for a suitable ink and paper for it—conditions that do not always obtain in the general printing-room. Process blocks entail much more trouble, and require greater care at the hands of the printer, in the "making ready," than is the case with engraved ones; hence they do not, as a rule, meet with such a welcome in the machine department as is the case with line ones.

Seeing that half-tone blocks, as at present made, do not suit the working of such papers as now seem, to a large extent, to be giving them up, leads one to inquire whether it will not be well for experimentalists to turn their attention towards producing such as will? "If the mountain will not go to Mahomet," &c. So with the commercial phases of process work. If printers will not, or cannot, adapt themselves to the present process blocks, the makers should try to give them such as will, if possible, suit their system of working. If it is found necessary in order to secure the best results, under existing conditions, that more hand work be expended on the blocks, by all means let us have it. From a business point of view the end justifies the means, and the end to be attained is that which best pleases the general public, and that, in the leading illustrated papers, does not just now seem to be process work.

THE DECOMPOSITION OF GELATINE FILMS.

A COMPARATIVELY new form of trouble, to which we made allusion a fortnight ago, seems to be more prevalent than we were aware at the time we mentioned it, judging from several communications we have received, as well as from the results of experiments we have ourselves made. Probably it is due to the fact of our calling attention to it during the prevalence of weather that tends to favour it that it has suddenly stepped into prominence; but the fact appears undoubted that, either

from the effects of electrical disturbances in the atmosphere or from the sultry state of the weather, a peculiar kind of decomposition is liable to set in in negative films during the period of washing after fixing, and even between washing and the completion of drying.

We have for many years past occasionally met with instances in which the films during more or less prolonged washing have become soft and partially decomposed, even to the extent, as mentioned a fortnight ago, of being, as it were, eaten into holes; but in these cases the softening of the film has been most marked, and the decomposition, such as it was, has invariably taken place during the period the plates were in water. In the newer form of the evil, however, it appears that the injury to the films may and does occur entirely after the washing is complete and even after the excess of water has been removed from the films by pressure with a pad of soft linen or blotting-paper, and it is remarkable that, up to the stage of blotting off, the gelatine surface exhibits not the slightest tendency to the defect, the mere fact of its withstanding the treatment necessary for the removal of the surplus moisture being sufficient proof that the film has not reached the "slimy" condition which has been previously referred to.

Whether the result is due to electrical disturbance or simply to the prevalence of a high temperature we do not intend to decide, but the evidence of the past few days is all in favour of the former view, for, while a general "thundery" condition has been present, the temperature has at times, though close, been decidedly below the average summer height, and, occasionally, even chilly. Comparing this with the fact that the same plates that have recently succumbed to the evil have, during the prevalence of much hotter weather some weeks back, entirely escaped it under precisely similar treatment, it seems only reasonable to argue that the result is due to electrical causes rather than to mere temperature.

Let us describe the effect which, in our own experiments, is exactly similar to that described by several correspondents. The plates have been developed and washed in the ordinary manner; but, in order to guard against any possible injury arising from the prolonged action of tepid water, the washing has been performed as rapidly as was deemed safe for the removal of the hypo in rapid changes of water carefully cooled down to 60° Fahr. After this, to still further minimise the chances of the surface water reaching a temperature sufficiently high to act injuriously, the excess has been removed, as already stated, by carefully pressing the film with a pad of soft linen, an old and perfectly dry cambric handkerchief being the article we have employed. It may be well to remark that the injury, such as it is, is in no way the result of physical damage to the surface by the use of the handkerchief, since, after the blotting off, the films have been as absolutely free from any trace of pinholes or "pits" as before development, and, moreover, other plates that have for comparison not been submitted to the particular drying operation, have shown the defect even more prominently, owing, no doubt, to the longer time occupied in drying.

We start, then, with the films in a surface-dry condition, and perfect so far as freedom from pinholes or transparent spots is concerned. Some of these have been reared up to dry in an airy situation, and fully protected from any chance of sun heat or artificially raised temperature, while others have, when nearly dry, been finished off in sunshine—a practice we have frequently resorted to in hotter weather than the present, when it was necessary to dry a negative rapidly. Only on one occasion, when the sun was abnormally powerful, have we previously found this treatment to result in injury, and in our recent experiments, although, in one or two instances, defects have appeared during the process of sun-drying, we have no reason to suppose that they would not have appeared with equal certainty if the films had undergone the longer drying at a normal temperature.

To return to the negatives dried spontaneously at the temperature of the atmosphere, these were found, about an hour after the completion of the blotting-off process, to present the appearance of being covered with a number of depressions, varying in size from scarcely larger than a pin's point to a good-sized pin's head, and accurately resembling the defect so well known some years ago—and not altogether unknown now—as "pits." As the drying proceeds, these hollows or depressions become more marked, presenting a clear, hard edge, and a cup-like, hollow form, and in the worst cases, during the later stage of drying, especially in sunshine, the centre of the depression reaches the glass, and the spot becomes transparent. When dry the spots are perfectly circular and transparent, showing, by transmission, a clear, sharp edge, and, on the surface, the cup-like form of the old "pit." In occasional instances the transparent portion has been surrounded by a dark line, as if the gelatine had melted and receded to the edges of the hole; in others, a central black speck appears, as if the softened gelatine had collected in the open space instead of at the edge; but these have all been cases where the spots have been of large size.

In one instance we were fortunate enough to be able to watch the progress of the formation of these spots from their earliest stage. The first appearance was in the form of slightly *raised* points like specks of dust, contained in the film, and these gradually became larger until, under a magnifier of only moderate power, they were found to be caused by minute bubbles on the gelatine which gradually swelled until plainly visible with the naked eye. In this particular instance, whether from the fact of the film not being badly "infected," the bubbles had not time to burst before the drying was complete, and in the finished negative they remain as palpably imprisoned air bells. In this case the whole progress of the decomposition was watched from stage to stage, and we think it can be clearly said that it was undoubtedly due to decomposition occurring from causes entirely removed from any circumstance connected with the preparation of the emulsion or the coating of the plate.

As to prevention, we have satisfied ourselves that alum is perfectly without effect—indeed, if anything, it may be said to intensify the evil, for the worst specimens we have obtained of the spots are on plates in which alum was used, while some of the films that have come off free or nearly so have been unalumed. This would seem to be perfectly in accordance with an observation made by the late Mr. Woodbury, who once told us that, in certain conditions of gelatine, alum not only had no hardening action, but actually hastened its decomposition; and, in illustration, he showed us a number of Woodburytype prints that had been partially, and in some cases nearly, completely dissolved in the hardening bath of alum. This was about the present time of year, so possibly the result then was more or less directly due to electrical disturbance.

The only effectual, or rather the nearest approach to an effectual, remedy we have found is to treat the films after washing with a mixture of methylated spirit and water in

equal parts, allowing the films to soak for three or four minutes and then blotting off, as already mentioned. The ordinary mineralised spirit can be used, but it must be mixed with water before applying it to the plate. The drying is by this means greatly expedited, in addition to which the spirit seems to exercise antiseptic action. Aqueous solution of boric acid also has an alleviating action, but it does not altogether arrest the evil. Possibly a combination of the two methods would prove a perfect remedy.

Lippmann's Colour Process.—We understand that the prizes and medals of the Paris Société d'Encouragement have recently been awarded. The prize of 12,000f. (480*l.*), awarded every six years to the author of the most useful discovery to French industry, has been given to Professor Lippmann for his method of photographing colours.

Deciphering Faint, Illegible MSS. by Photography.—In the *Bulletin* of the St. Petersburg Academy of Sciences for April will be found a paper by E. Burinsky, describing his method of restoring by photographic means the writing faded to invisibility of old documents. He obtains a number of pellicular negatives, superposes them exactly on one another, and thus, under a suitably regulated light, renders them visible.

Photographing the Whole of the Corona on One Plate.—The difficulty in obtaining a photograph at one exposure of the whole of the corona with its zones of light of immensely varying intensity has hitherto been insuperable; a succession of photographs of varying exposures has been necessary, a complete whole being afterwards built up from them. The President of the Astronomical Society of the Pacific has, however, devised an ingenious mode of surmounting these difficulties. A quarter of a second is sufficient exposure for the part of the corona close to the moon's limb, while half a minute or more is needed for the extreme zone. Mr. Burckhalter has devised an apparatus to graduate the exposure for various portions of the plate by means of a diaphragm revolving in front of the plate, permitting the light to act for shorter periods the greater its intensity. The contrivance is said to be as useful as it is simple.

New Method of Illuminating Opaque Objects for the Microscope.—With very high powers this has hitherto been almost impossible; but, at a recent meeting of the Paris Academy of Sciences, M. Marey, of instantaneous photography fame, in the chair, M. Ch. Fremont described a novel and extremely ingenious method of carrying out the desired end. Inside the body of the microscope is fixed a concave mirror, which reflects the bundle of rays of light received through an aperture in the side, and rendered parallel by an interposed prism, through the object-glass, on to the object under examination. It will at once be asked how the eye, and at the eyepiece end, can see the object. This is ingeniously provided for by the simple expedient of boring a hole through both mirror and prism in the track of the rays passing from the objective. The Chairman said he anticipated great use from the contrivance in the chromo-photographic study of the movement of microscopic beings, and our readers will readily see a number of other uses that can be made of the new scheme.

A Scheme of Colour Standards.—The difficulties of describing any particular colour so as, by mere verbal instructions, to permit of its being exactly reproduced at will, are too obvious to need recountal. Under the signature of J. H. Pillsden, of Malden, Mass., U.S.A., is described, in last week's *Nature*,* in a letter extending over six columns, a complete scheme for colour standards by written description. We refer our readers to the letter for full details, giving here but a short summary. Every photographer knows how nearly impossible it is to describe with any accuracy the colours, for example, on a chart to be photographed by isochromatic plates, or even the exact tint of a dark-room window, but Mr. Pillsden's scheme renders such a description possible, and, more than that, simple. In consultation with seven eminent scientific men, six typical portions of the spectrum, representing red, orange, yellow, green, blue, and violet, were chosen, and, by means of carefully selected "aniline" colours, imitated on paper, the use of pigments having been found impossible. Mr. Wilton Bradley, of Springfield, Mass., carried this idea out practically, and for some time has provided papers so stained or coloured for kindergarten and primary school work. It is found that the necessary colours are, in some instances, fugitive, so that the standard tints will require occasional comparative reference to the spectrum itself until less fugacious exponents are discovered. So far, six colours only are referred to; intermediary tints, such as orange-red and red-orange, have to be introduced into the nomenclature. It then remains to mix the colours in various proportions with one another, or with white or black also—all in various proportions indicated by figures only—to obtain every known hue and tint. Initial letters and figures are adopted for the purpose. As to how the colour-mixing is carried out, we may say it is effected by the well-known Maxwell discs. The names of a variety of natural objects are given, and the typical combinations of letters and figures describing their colours are tabulated as working examples of this ingenious and useful scheme. It only remains to say that the sender and receiver of a description will each, of course, require to be provided with sets of the coloured tablets.

* *Nature*, vol. lii. p. 390 *et seq.*

DELEGATE'S REPORT OF THE SHREWSBURY CONVENTION, 1895.

[London and Provincial Photographic Association.]

In this short report of the meeting of the Photographic Convention of the United Kingdom at Shrewsbury I intend to give you a rough description of some of my own experiences rather than a repetition of the official reports, with which, no doubt, you are well acquainted by this time.

The Shrewsbury meeting being the first Convention meeting that I have attended, I cannot judge it by comparison with others, so must judge it entirely upon its own merits. I will tell you at once that I did completely enjoy myself. So far as I can understand, all previous Conventions (Dublin excepted) sink into complete insignificance beside this Shrewsbury meeting, and to those in search of a means of enjoying themselves for a week I can strongly recommend the Photographic Convention.

The arrangements were evidently made with great care, for everything went along very smoothly. Very great praise is due to our Mr. Drage, also to the local Hon. Secretary, M. J. Harding; in fact, to the whole of the Shrewsbury Executive.

When I had quite determined to go to Shrewsbury, I felt inclined to leave all apparatus at home, as I did not intend to turn the week into seven days of hard labour. However, I gave way to the kindly pressure of a Convention veteran, and took a whole-plate kit, but only four double slides. On Monday morning, July 15, at half past eight, I made a start for the Metropolitan line to Paddington. I may have taken a hand camera; had I done so, I really think I should have collapsed. I soon discovered that this would be anything but a week of rest; the toil of pleasure had commenced.

At Paddington station two carriages were reserved in the 9.50 for Mr. Welford's party, but that gentleman could not obtain any reduction in the fares.

We arrived at Shrewsbury at 1.15. Hotel accommodation was not very plentiful so far as I could tell, as the assizes were on. By the kindness of Mr. Drage I was booked for the George Hotel (headquarters). There were several double-bedded rooms not engaged and several Conventionists not accommodated. We were prevailed upon by the Manageress to join in partnership with one another, which I did with a fellow-member of the London and Provincial Photographic Association.

During the afternoon a Conventionist said to me, "I am pleased to hear that you have joined partnership with a fair Conventionist." Oh, horror; am I really paired up with a fair Conventionist? After being called a sly dog and various other uninteresting names, I was-

told that *he* really was fair. But most emphatically *he*. We went along very well together, but I was not altogether charmed by those sweet strains from that nasal organ of hisen. Monday afternoon was spent in a short survey of the town, in which are some fine specimens of black-and-white timbered houses. In the evening at 7.30 was the reception by the Mayor of Shrewsbury (W. G. Cross, Esq.) in the Guildhall, on which occasion the President read his address. So far as I could see we quite filled this fine hall, and there appeared to be no seats reserved, except for the mayor, one or two aldermen, and the presidents past and present. The mayor expressed his delight at seeing us and receiving us. After several individuals had patted several other individuals on the back, we retired to the large music hall a short distance away.

The photographic Exhibition was of considerable extent. There were several very interesting exhibits, many of the latest novelties. A lantern show, illustrating the Dublin Convention, completed the programme for Monday. Tuesday commenced the execursions, the weather heavy, and showery, and windy. In fact, the wind was my greatest trouble in making exposures all the week through. The excursions were very enjoyable. The luncheons served at the excursions far surpassed my expectations, and were freely given by several very kind and generous local gentlemen. These luncheons were a slight check to those who came to work, as they were timed, and one had to leave most beautiful scenery to reach the places in time. This day I went to Wenlock and Buildwas Abbeys with a large party. At Wenlock we were favoured through Mr. Williams (the President of the Shropshire Camera Club) with a view of the Old Council Chamber. In this Chamber the old stocks used in past generations are preserved. They are made to accommodate three culprits at the same time. So strong was the desire to place our President where we could find him, that he was placed in these stocks; and a Conventionist photographed him, with Mr. Wall on one side and your humble servant on the other. This caused some fun the following evening when thrown upon the screen in the large hall. The exposure given was one minute, and I can assure you that this was as much as I cared to be exposed in that position. In fact, I was afraid they would all bolt and leave us to spend the rest of our lives as a little joint-stock company. In reference to the reading of papers, I feel certain that a good selection of games, a performance of the ancient play of Punch and Judy, or a grand display of fireworks, would do far more to complete the enjoyment of the Conventionists, though a great many attended to hear them read.

It seems to me that the chief aims of the Convention are pleasure and enjoyment. The termination of the official evening meetings was not the end of the day to the majority. Each evening a post-Convention meeting was held; at these some good songs and recitations were enjoyed. Yet again, on at least two occasions, these were not the end. On one evening a special meeting of the distinguished Society known as the A. M. S. was held, and two new members was the important result of that meeting, those new members being the distinguished photographers H. P. Robinson, Esq., and Paul Lange, Esq. These gentlemen expressed themselves highly gratified at the honour done them. The other occasion to which I referred was when a deputation of Conventionists visited the President long after he had retired to rest. I was not present at this meeting, but I believe that the President enjoyed that nocturnal visit as much as anything during the week. A great many were leaving Shrewsbury on Saturday. A few arranged to go to Stokesay in the morning, and return early in the afternoon. We left all our luggage at Shrewsbury station, so that we did not return to our hotel. Arrived at Stokesay, the weather was dull and heavy, but some good exposures were made in and around the Castle. Inquiries were made at the Keep for refreshments, but the old lady said they only had enough for themselves, and were getting peckish. After considerable pressure, she found us a little cake, bread and butter, and ginger beer. Thus revived, we set to work again.

Shortly after the others had finished and packed up, I ultimately planted my camera for the last exposure. The others were tired of waiting, and started for the station. I hurriedly arranged my subject, and was waiting for a lull in the wind. I had just made my exposure when I saw them disappear round the corner. There was not much time to spare in catching the train. Ah! my gentlemen, you mean to cut on, thinks I, do you? with a smile on my face. Now, during the time required to execute that smile, I had unscrewed my lens from the front of the camera and held it in my hands, when I observed, "Great heavens, I have not closed the shutter of my dark slide!" I don't know how I survived that shock. I quickly collected my items of wood, brass, and glass, shot them in my bag, and went my way, utterly disgusted with photography. Well, I found, after all my hurry, that they had waited for me round the corner. We then trudged to the station, took tickets for London, and, on our arrival at Shrewsbury, found we had only a few minutes to catch the train, to which we had to change over. We just managed it, and it seemed quite a relief to me to feel that I should have a rest for an hour or two. Strange as it may seem, we had just settled ourselves a bit when we recognised the fact that we had no provisions, and we only had a spare supply at the Keep in the morning. Confined until 8.30 and nothing to eat! The President consoled himself in sweet slumber, and was soon lost to the troubles around, another did the same, whilst I and Mr. Welford soothed ourselves by smoking. Some time having passed in this way, the guard paid us a visit, and we told him our trouble. He told us that he had just prepared tea for himself, but was too queer to eat it (fortunate circumstance), and we were welcome to it. Oh, rapture! we were saved. In a few minutes a small pot of tea and two quarters of scone were brought. Evidently the fumes of the tea roused our President, and his eyes sparkled at the sight of those provisions, which were divided among four of us. This timely supply revived us considerably. The guard had a shilling from each for his kindness. Had it not been for this good fortune, I believe lots would have been cast, and one of us would have been demolished by the other three. "All is well that ends well." In due time we arrived at Paddington, and so ended (to at least a small contingent of it) the Convention of 1895.

J. S. Teape.

A NOTE ON HYPOSULPHITE OF SODA.

A fault that has recently been brought to my notice is, I think, worthy of being more generally known, and may explain some of the mysterious spotting that we have complaints about from time to time. A parcel of hyposulphite was purchased at the full price, and was apparently a good sample, but with its use certain defects began to show themselves on both negatives and prints, to their serious damage.

The hypo was not at first suspected, but after the removal of other supposed possible causes, with no abatement of the trouble, a first sample of the hyposulphite was tried, when the fault disappeared entirely, to be renewed immediately the first sample was used, this recurrence putting it beyond doubt that there was something wrong with the salt. It was noticed that, soon after the plates or paper were immersed for fixing, a sandy deposit was formed consisting of tiny crystals, nearly black in colour, which adhered to the surface of the plates and prints, and, wherever they did affix themselves, an orange yellow spot was formed after use, the solution being kept in a glass jug; these crystals were thickly deposited over the bottom, each crystal being surrounded by an orange stain, thus showing their solubility. On rubbing them off the prints, to which they but loosely adhered, an orange smear was formed, thus completely spoiling the white margin of vignettes. On negatives tiny orange specks, printing white, were left. Very dilute hydrochloric acid being applied, the spot and marking were immediately destroyed, leaving on the negative clean glass, and on the print no image at all, either of which was fatal to the work, and the amount of retouching necessary to remedy it was quite too much, prints and negatives being both rendered useless.

The probability is the hyposulphite was contaminated with some soluble iron salt that formed a compound with some constituents of the emulsion, and being slightly soluble was precipitated. The whole thing was quite a new experience to me. Some one else has possibly been troubled with spots on their work that it was difficult to account for, and which this incident may possibly explain.

Edward Dunmore.

PHOTO-MECHANICAL NOTES.

The half-tone block is just now entering upon a new stage, and the evolution seems to promise that in time the process so much despised by our superior critics will be really recognised as artistic in that peculiar sense of the word that is so well understood in its application. Those who have watched the course which the illustrative methods have been taking of late in America, and who have seen the most recent examples of half-tone work in various printing trade journals and the high-class magazines, cannot have failed to notice the way in which the blocks have been retouched by hand tooling in the style of wood-engravings. So elaborate in some cases is this after-treatment, that the half-tone is almost entirely lost, and one can see that the labour expended by the engraver has far exceeded that in making the half-tone etching in the first instance. But the most successful work has been where the retoucher has simply at-

tempted to remedy the manifest defects of the half-tone reproduction, giving it more contrast and brilliancy. High lights have been judiciously heightened, harsh shadows toned down, and the monotony of the screen grain broken by white lining through it where most prominent. In this way some very charming effects have been produced, resembling, and certainly coming very near to, the highest class of wood-engraving. It is, indeed, quite evident that the retouching is the work of a wood-engraver, who has thus found employment in the process which has been the means of his downfall, and it will be a singular anomaly if half-tone rescues the wood-engraver from poverty, whilst the wood-engraver lifts half-tone from the rut of artistic limitations.

The change will undoubtedly be beneficial commercially to both businesses. It will raise the standard of quality, and half-tone blocks will be appraised in value according to the amount of artistic skill expended upon them, and not according to the number of square inches in their area. Wood-engravers will not need to try to compete with half-tone; it will pay them better to retouch the process blocks.

It is not to be supposed, however, that this happy time is going to be realised all at once, and certainly, so far as this country is concerned, we have not yet risen to a perception of the possibilities which the retouching of half-tone blocks opens up, and only to a very limited extent has anything of the kind been attempted. We always lag a year or too behind our American friends in process matters, though "we get there," as they say, "all the same." There is no grand secret about this new method, but wood-engravers must not expect to take up a half-tone plate at first attempt and make a good job of it; in fact, it is more than likely they will spoil it. Before any success can be attained, the half-tone photo-engraver will have to make plates suitable, and they will have to be on copper, for zinc is too treacherous a metal for tool engraving. Intaglio engravers know well the quality of copper for cutting under the graver, and the ease with which it can be rebitten without detriment to the work.

The adaptability of the enamel process to copper is also a great advantage in retouched work, for the resist is so firmly attached to the metal, that the graver work can be done either before, after, or at any stage of the etching without detriment to the picture, which forms a clearly visible groundwork at all times. Some of the white-lined backgrounds which have been seen of late on American blocks are most probably cut before etching is commenced, as it would be impossible to run the graver across the half-tone dots in long white lines when the grain has acquired relief. This surface cutting need not, in such case, be very deep, as the etching may be trusted to give it the necessary depth. The most artistic retouching will, however, be done when the plate has been etched sufficiently deep to take a proof. Only then will the imperfections of the half-tone be fully seen, and will be remedied by retouching and rebiting. Here the engraver and the etcher will have to work hand in hand, unless the former is fortunate enough to be able to etch as well as use the graver. A good deal may be done by local application of the etching solution, and it will be found a good plan in such case to mix the perchloride of iron with gum, so as to thicken it and prevent it running beyond the space required. Judicious stopping out can also be resorted to, and in the end the burnisher and roulette can be brought into play, though too much application of these tools often injures the printing qualities of the block.

The danger of this new departure is that very likely too much reliance will be placed on the possibility of after-treatment of the plate, and the photographic operator, the process printer, and the etcher will be apt to neglect their duty to obtain the best possible result in their several departments. I am one of those who believe that in half-tone reproduction the negative "is everything," and a bad one will have a baneful influence on the whole of the processes through which a half-tone goes. I believe I could make fully twenty different negatives from the same copy the same size, with the same screen throughout, and the print from each negative would show a distinctly different result. Let any one consider the variety of results to be obtained by varying the exposure, the stop, the distance of the screen, the development, and after-treatment of the negative. The personal equation is predominant throughout the half-tone process, and it is not too much to say that it is quite twenty to one that the average operator hits the exact best result in the negative he makes. This being so, is it any matter for wonder that there is so much unevenness in the quality of the half-tone work we see published? and, if we are to add another personal equation in the person of the retouching engraver, the half-tone block, so far from being mechanical, will be very human in its caprices.

It is often urged that American half-tone work is so much superior to English work. Granted that may be, why do we not try to catch up? The superiority is not because of any special advantages which the American workers possess, but simply that they have learnt that a certain kind of negative, printed and etched in a certain way, gives the best possible result. It is hastily assumed by some workers that the only thing necessary to emulate or equal American work is to buy the same apparatus and a secret process. What is the result? Some succeed, some fail, but the great majority go on producing a mediocre quality of work which never comes anywhere near the ideal at which they have aimed. The fact is that they may buy the apparatus and the process, but they cannot buy the experience so readily. They do undoubtedly purchase the experience in the end, but they have to get it by instalments, spread over a long period, and paid for, like furniture on the hire system, very dearly. Experience is not a tangible thing which you can have "while you wait," though you may get it if you wait long enough. The apparatus may be as perfect as it is possible to make it, the chemicals never so pure, and the formula as explicit as it can be written down, but without that "indefinable something"—call it tact, knowledge, experience, intuition, or what you will—you forget, or you do not know, how to do the right thing at the right moment—the little variation which makes all the difference between a good and a bad result.

I always feel how hopeless to overcome are the limitations which beset any one who attempts to write of or teach a process. You may set down as carefully as need be a certain formula and say that, if such-and-such a course is followed, a certain result will be attained. But something or other doesn't come off, and the student thinks unutterable things, either in sorrow or anger, of his mentor.

To attempt to say exactly how a half-tone block should be retouched is a case in point. Whether the improvement should be simply brought out by re-etching, by the use of the burnisher, the roulette, the graver, or the scooper, is a matter which must be determined by circumstances, and by the experience of some one who can define what is requisite. But it does seem, from the numerous examples I have seen, that a half-tone block can, in nearly every case, be considerably improved by an intelligent use of the graver.

WILLIAM GAMBLE.

A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.

X.—PHOTOGRAPHING SHIPS' INTERIORS.

IT frequently happens, when photographing on board ship, that some corner containing objects of special interest is particularly desired for the purpose of book illustrations; and not infrequently subjects of this description are handed over to artists to sketch, on account of the supposed difficulty, or even impossibility, to photograph them.

Publishers, however, as a rule, whenever anything like a decent photograph can be executed, prefer such to a drawing of the same, for the public, generally, are not slow to detect the difference between half-tone pictures executed from photographs to similar views produced from hand drawings. No doubt, the reason for this is found in the appreciation of absolute truthfulness of design conveyed to the mind when it is seen the reproduction is from a photograph. Publishers are not ignorant of this, and hence the preference which is at all times given to a photograph.

Among subjects of this kind may be mentioned specially fitted-up cabins, doctors' dispensaries, barbers' shops, bakeries, pantries, and many other interesting and novel additions to the more modern first-class steam ships of the present day, the including of which goes far to embellish an illustrative catalogue for advertising purposes.

When dealing with subjects of this kind, the great difficulty in my experience has been, not so much the want of light to photograph such with as the difficulty experienced in securing enough room to work in.

In nearly all instances of this kind, where the situations are so cramped and confined, the idea of employing a tripod is quite out of the question, therefore some simple but practical substitute for such must be provided. In this, however, there is really no difficulty, for there is no end of the resources that a photographer may not fall back upon in an emergency. This may mean the employment of any small article or box, always at hand on board ship, or even the utilising of some suitable fixture, such as a shelf or ledge, often found in such places, where the utmost ingenuity is displayed by builders and designers in providing accommodation for storing away articles in the most limited amount of space.

It has been well said that "necessity is the mother of invention," and I remember being more than ever struck with the force of this

remark on one occasion when face to face with such a difficulty as I have described.

It was when working in one of the pantries on board a large American steamship that the truth of this saying struck me so forcibly. I was asked to photograph on this occasion a part of the pantry that contained some new features in the way of fixings or fittings, which was specially desired for the guide book of this fleet of steamers. The difficulty in this case was the want of room to work in, so as to get sufficiently far back for the lens to embrace the view required. The employment of a tripod was quite out of the question, and the rigging up of a substitute for such meant cutting off the light in this particular instance, for the only source of illumination was behind the spot from whence the erection would have been put up. As luck had it, however, I noticed that a folding shelf had been erected exactly in the desired position; so I determined to make this do duty for a tripod. But how was I to get behind the camera to have the view properly focussed?

Having determined to utilise the shelf as the standpoint from which to take the picture, a little thought enabled me to overcome the focussing difficulty, and this is how I set about: Procuring a candle, I removed the camera outside into the dining saloon. On one of the long tables I placed the camera, and, having previously, by means of an inch tape, made a careful measurement of the exact distance from the lens to the centre of the point of attraction it was desired to show in the picture, I placed the lighted candle at exactly this distance from the camera, focussed the flame sharply, then placed the slide carrying the sensitive plate into position in the camera, and removed it back again to the same position on the shelf in the pantry, taking care to remeasure from the lens to the selected point on the picture. This done, the plate was exposed, plenty of time being given (in this case it was no less than four hours), and the result surprised at least one individual, who fancied he knew something about photography, and who maintained that it was out of the question to photograph in such a confined situation.

The fact is, much may be done in the most confined places if an operator knows how to properly set about working. As I have said, the first and chief difficulty is finding a standpoint for the camera; this done, the focussing is easily accomplished, after the manner I have described; and wherever there is light, let it be remembered, a sensitive plate will respond by yielding a good negative image, provided plenty of time be given. It's no use stinting the time; if on first thoughts one hour is judged sufficient, give it two, or even more. I verily believe there is no over-exposing a plate in such positions, provided one's apparatus is in an absolutely perfect condition. This in itself means a good deal more than a casual worker has any idea of. It means not only an absolutely dark interior to the camera, but, further, not a particle of reflected light must be permitted to reach the plate from any source whatever; hence my reason for having in these previous articles suggested the employment of using large plates and cameras in conjunction with lenses of short focus, or, in other words, lenses that will not cover the entire plate. A lens that not only covers the plate, but at the same time projects portions of the view on to the sides of the bellows of the camera, should never be used; and in my humble opinion every conical shape bellows which, when extended, are certain more or less to droop in the centre and interrupt the rays from the lens, should be gathered into a heap and burnt, and wouldn't they make a bonnie blaze! There is nothing like a good square camera for all-round working.

The utmost precautions should be taken to guard against each and everything that would tend to cause surface fog when giving these long exposures, and no plate should be used that is not backed with bitumen dissolved in benzine and chloroform.

It is not only, however, by such means as I have described that results are obtained when working in situations that many deem quite impracticable for photography. There are other resources which a photographer may at times fall back upon.

I remember, many years ago, being forcibly struck with the power that was placed in a photographer's hands by simply utilising an ordinary mirror for many purposes in photography; and years afterwards, when it fell to my lot to produce reversed negatives by means of a reflector, I was more than ever impressed with the value of such when it was required to photograph some particular object that was situated in an unsatisfactory position.

In numerous instances, when working on interiors, advantage may be taken of any good mirror, even so far as taking portraits in an ordinary room; but, perhaps, in such instances where it is desired to photograph some object that is a fixture, and which is situated right up against the source of light, will the value of a mirror be appreciated by practical workers; and I have known a case where, by a clever arrangement of two such reflectors working in conjunction, an otherwise unsurmountable difficulty was overcome.

Another class of subjects very frequently met with on board ship is such portions as are situated under deck roofs, but which are open at both fore and aft ends. The light in such places is often very deceptive, and because such are open to direct daylight, or, in other ways, have no windows to admit the light, the mistake is often made, that such do not require very long exposures.

I have found that such subjects will stand almost any amount of time. Of course, hardly two instances will be found the same, but, as a general rule, the exposure to all places of this description is very long, certainly not less than hours depending upon the depths of the shadows on the darkest corners.

An example of this kind of subject is seen in some of the engine rooms, or portions of same, and these are not the easiest to photograph by any means.

T. N. Armstrong.

"AN IDEA IN PRINTING FRAMES."

Not an invention my friends, but an adaptation.

If a man suddenly "goes in for" a *film* camera, it does not follow that he wants to lay out money for all sundries to fit the new purchase; hence, a desire to economise in the matter of sundries is rational and sensible.

In the absence of a dozen or so quarter-plate frames, it is convenient to be able to print from two films at a time (presumably quarter-plate), using *one* frame only. This can be done at small cost and trouble, as follows:—

Take an ordinary half-plate frame, and fit to it a new back, a piece of hard flat and tough wood must be selected; divide this neatly into three pieces and hinge these, four hinges being required; then glue on a piece of thick cloth which, when dry must be, of course, subdivided at the bend. Now put on the frame *a third spring*, midway between the first two.

This done, we get a frame in which, fitted with a glass plate, we can print from a couple of film negatives, being able, of course, to remove and replace one without disturbing the other.

Frames made in this way would, I think, find a ready sale, one gets a good even pressure, and when printing from the full-siz frame good *central* pressure. I have seen many large frames (24 × 20, &c.), made this way, but never any small frames such as half and whole-plate.

J. Pike

PHOTOGRAPHIC PRINTING BY MACHINERY.

[Scientific American.]

This new process of rapid printing consists essentially of a roll of sensitised bromide paper a thousand yards in length by something over a yard in width, unwound in a room illuminated by red light, fed under two or more negatives, then automatically pressed upward by a platen against the face of the negative, at the same instant also automatically exposed by the flashing of incandescent electric lamps above the negatives, then moved along the proper distance for a fresh section to be exposed and finally wound up on another roller.

The roll of exposed film is next removed to another room and automatically developed, fixed, alumed, washed and dried, the finished pictures being wound up on a third roll from which they are c it to size and mounted on cards in the usual way.

Actually to see how easily and certainly this process works and learn of the obstacles that had to be overcome not only surprises but astonishes the old time photographer. It is, in fact, a new industry in the line of photographic printing, and will be useful in hundreds of various kinds of businesses where prints by hundreds of thousands from one negative are desired.

The accompanying illustrations sketched from the apparatus in operation give a very good idea of its construction and working.

Taking the exposing apparatus first (fig. 1), the roll of unexposed paper supported on a shaft on the left may be seen hanging therefrom in a loose loop and enters the inclined apron, thence passes directly under the negatives, which are secured to the under side of a large sheet of glass by paper strips in the usual way. The glass plate is held in a removable frame, which permits the negatives to be easily located and secured. When the plate is in position, vignetting masks are laid on top of the plate over the negative, and if, by a trial, the exposure has been found too long for one negatives, thin sheets of waxed or tissue paper are interposed to weaken the light to the proper degree. Several negatives of a similar degree of density may thus be secured to the plate, and each adapted to the light necessary for a proper exposure. Much care and nicety of judgment is required in this adjustment as the success of the latter manipulations hinges upon it. Above the negative plate is

observed the exposing chamber suspended by a rope passing over a pulley in the ceiling, and balanced at the other end by a weight; this arrangement permits the whole to be raised above the negative plate, giving easy

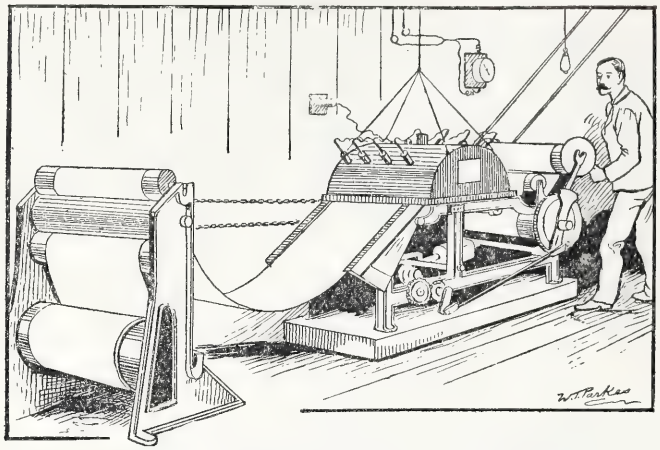


FIG. 1.—Automatic Photographic Printing—the Exposing Apparatus.

access thereto for the adjustment of vignetting masks. In each side of the case are four 32-candle power incandescent electric lamps connected by flexible cords to a switch on the wall and to the automatic switch below. The heat from the lamps was found to be excessive, and ventilation was obtained and the temperature kept quite uniform by forcing in a current of air with an electric fan or air pump. A square red window on the side allows one to observe that all the lamps go when the switch is turned on.

After exposure the paper is wound over a pull roll, adjoining the exposing chamber, by an intermittent quick movement equivalent to the length of the negative plate or at any set distance, passing thence to a roll whose axle works in ball bearings, on which it is wound, the roll being rotated by an attendant. A reciprocating motion is imparted to the pull roll by means of a connecting rod attached to a crank shaft located under a feed apron, at the lower left-hand portion of the machine.

The end of the connecting rod at the pull roll engages in a slotted lever, the upper end of which has a ratchet and pawl operating in teeth on the periphery of the pull roll. The end of the rod may be moved nearer the centre of the roll in the slotted lever, and so regulate the throw or amount of rotation. A sprocket wheel at the opposite end of the pull roll is connected by a chain with the feed roll. It is evident, therefore, when the pull roll makes a half revolution rapidly, the feed roll is also simultaneously rotated, causing the same amount of paper to be unwound as is taken up at the other end. Geared with the crank shaft under the feed apron is a shaft having a cam for operating at the right moment the

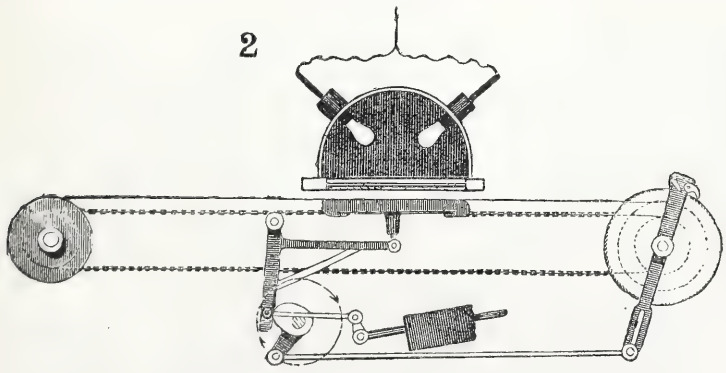


FIG. 2.—Detail of Exposing Apparatus.

electric switch for the lights, and another cam for lowering the platen (see fig. 2). Prior to the moment of exposure, the cam, as it rotates, permits the pivoted weight to draw the bell crank lever supporting the platen forward, and press the platen upward against the under side of the paper, placing the sensitive side of the latter in contact with the negatives during the interval of exposure (usually two seconds) it is then drawn down until a fresh section of paper passes under the negatives and the operation repeated. The movement is quite similar to the platen of a printing press.

The roll, containing two or three thousand exposures, is carefully protected from white light and carried to the room in which is located the automatic developing machinery (fig. 3).

It is a most interesting sight to see the gradual development of the exposures here. As may be imagined, the exposed roll is set on supports at the right-hand end of a long wood tank containing separate watertight compartments, and is carried over a roll into compartment No. 1, about 3½ feet deep, filled with 120 gallons of an old solution of ferrous oxalate of potash developer. Referring to fig. 4, it will be noticed that halfway up from the bottom of this compartment is a submerged roll. Running down vertically in the centre of the sides of each compartment is a slotted way to guide the axes of small, loose, brass rollers which carry

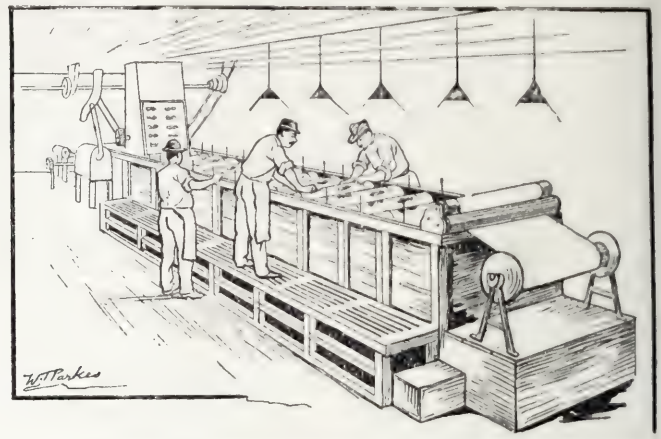


FIG. 3.—Automatic Photographic Printing—the Developing Apparatus.

the paper to the bottom and freely revolve as the paper moves forward.

Over the division of each compartment is an actuating roll, all being geared to a worm screw running along the top edge of the long tank its entire distance, which gives every roll the same speed.

The paper, after passing over the submerged roll (fig. 4) and down again, thence up out of the tank over the roll between the first and second tanks and down into the fresh ferrous-oxalate developer in this tank, shows the images half developed out. The electric lamps overhead are a non-actinic red.

Coming out of the second tank, the images are fully developed, thence the paper passes on into the third vat, containing dilute acetic acid, which dissolves out all of the iron left in the paper from the developer, and

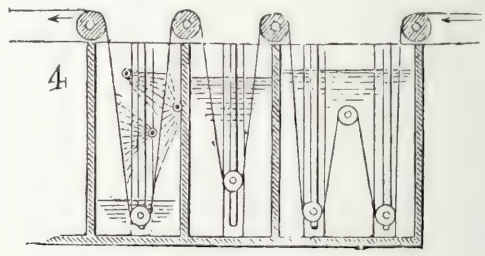


FIG. 4.—The Developer Tank.

acts as a check to further development, thence in the next vat the paper is washed with water; next it passes into a fixing vat containing a solution of hyposulphite of soda, is again washed in the following tank, then it passes into a vat of alum water, which hardens the film, and finally goes through two or three vats of water, receiving a final spraying as shown in fig. 4.

From the latest spraying it is led on to an endless canvas carrier into a long enclosed chamber filled with a current of warm air, heated by a gas furnace noticed near this end. At the end of this heated chamber the paper comes out perfectly dry, and is rolled np with the pictures all on it. When the run is complete the roll of pictures is unwound, they are cut off to the respective sizes desired, and mounted in the usual way.

While the paper is travelling over the several rolls, attendants with sponges sponge off any dirt or light material which may cling to the surface as it is drawn up from the solutions. At the further end of the trough the paper with the pictures upon it may be seen travelling upward.

A very curious anomaly is the mixture of white and red light in the developing room. The two lamps over the developer and roll where it is unwound are red, while all the others are white. There is just enough red to neutralise the white at the beginning. Thus it makes the brightest dark room we call to mind, and was a surprise in art of photographic manipulations.

There are twenty-seven rollers on the large box tank, and the tank itself is not far from one hundred feet in length. The paper travels through the tanks at the rate of ten feet per minute, and it is possible to arrange enough cabinet negatives in the exposing machine to expose 245 cabinet pictures in a minute. But an ordinary day's work of ten hours yields 157,000 cabinet pictures.

We are informed that it is the only machine of its kind in this country, and but one other is in Germany. The work which we saw made by it was very satisfactory and uniform.

In dealing with such large quantities of material, uniformity appears to be easily attained, and the applicability of a similar machine, properly

modified to the development of negatives and films having had reasonable uniform shutter exposures, may be a possible outcome of this invention.

For the foregoing particulars we are indebted to the Automatic Photograph Company, No. 25, West Twenty-fourth-street, New York, through whose courtesy we were permitted to witness all the details of this remarkable and interesting apparatus and plant.

MERCUROGRAPHIC METHODS OF PHOTO-ENGRAVING.

[American Journal of Photography.]

PHOTO-ETCHING processes based either upon the increased readiness with which amalgamated portions of metal plates dissolve in some acid or the greater resistance which they offer to other acids, have been known for some years, but recently Mr. Villon has classified such methods, and so far simplified some of them as to render them easily serviceable for the ordinary work of the etcher, and, moreover, the application of photography to these methods is a very easy matter. The basis of the process in its non-photographic aspect may be illustrated by a few examples. An ink is made by smoothly mixing together the following :—

Water	100 grains.

Add and dissolve

Sugar	50 grains.
Glycerine	50 ,,
Alcohol	100 ,,

Finally mix in

Precipitated biniodide of mercury	40 grains.

Or a crayon can be made by incorporating

Biniodide of mercury	100 grains.
Mercurous nitrate	10 ,,
Powdered gum	20 ,,

Water, a sufficient quantity to make a stiff paste.

With either of the above, writing or drawing is executed on a polished zinc plate, with the result that the subject shows as bright amalgamated lines on the bluish-grey surface of the zinc, and such a plate, having been varnished at the back, is etched with 3½ per cent. nitric acid, or with hydrochloric acid of similar strength. The weak nitric acid attacks the amalgamated lines and gives an engraving in *intaglio*, while the weak hydrochlorate attacks the ground and gives an engraving in relief, adapted for typographic printing. In either case, should the lines show signs of being under-bitten, the plate should be washed, wiped dry with a soft cloth, and carefully rolled over with the following rebiting ground, care, of course, being taken to use a hard, smooth roller, and not to let the rebiting ground go into the etched cavities. A little heat will cause the rebiting ground to flow down the sides of the relief, and so protect them ; after which the etching is resumed.

REBITING GROUND.

Vaseline	100 grains.
Beeswax	12 ,,
Linseed oil	5 ,,
Lamp-black	5 ,,

When an original is to be reproduced by photography, a photo-lithographic transfer is made and put down upon stone or metal in the ordinary way, but, instead of inking up the design with an ordinary lithographic printing ink, the following is used :—

LITHOGRAPHIC AMALGAMATING INK.

Wax	40 parts.
Resin	30 ,,
Resin soap	20 ,,
Biniodide of mercury	10 ,,

A print is now taken on transfer paper and put down upon a zinc plate. In two or three hours the lines become amalgamated, the image is washed with turpentine, and the plate is etched as above. Alternatives are to use the above amalgamating ink in the preparation of the original photographic transfer, or to dust the face of the transfer with biniodide of mercury. Again the transfer may be made to zinc or copper with an ordinary fatty ink, and the image on the plate may be dusted with the biniodide of mercury. Another method is to treat the plate as for the ordinary dusting-on process (a gum or sugar and bichromate mixture), and, after exposure, to dust with the biniodide of mercy. When the amalgamated image is on copper, several methods of printing are available, but the simplest consists in rolling up the amalgamated copper with ordinary lithographic ink, which will only take on the unamalgamated parts, but the amalgamation must be kept up by occasional damping with a weak solution of mercurous nitrate, or by carefully dabbing it over with the preparation known to the pharmaceutical chemist, as "mercury with chalk."

THOMAS BOLAS, F.I.C., F.C.S.

THE USE OF SUPPLEMENTARY LENSES.

[Minneapolis Camera Club.]

AN article in a recent number of THE BRITISH JOURNAL OF PHOTOGRAPHY describes the use of single lenses for the purpose of altering the focus of a so-called fixed focus lens on a well-known hand camera. The plan is to insert in the mount a supplementary single lens of negative focus, in order to obtain sharp pictures of objects situated at distances less than that for which the lens was originally set. This principle of altering the focus of a lens by adding to it supplementary single lenses has long been known, and several years ago a European manufacturer placed on the market instruments supplied with a set of single lenses for this purpose. Mr. J. Traill Taylor, in his book, *Optics of Photography and Photographic Lenses*, describes a set of these lenses he had mounted in a plate of metal which could be inserted in a slot in the lens tube, and arranged so that any lens in the set could be brought immediately in front of the diaphragm opening.

This gave him practically the advantage of having a set of lenses of various foci. The average amateur is not usually blessed with an over-abundance of wealth, and often has to content himself with one lens for all kinds of work.

There are cases, however, where a lens of either longer or shorter focus would be very desirable, and, if a make-shift can be easily and cheaply obtained, it will often answer the same purpose as an extra-expensive lens.

Often, when out viewing, we see an exceptionally fine composition, but, on examination through the camera, find that, on account of the distance, the objects are so small as to be worthless. This is where the supplementary lens is useful, for by selecting one of the proper negative focus, and inserting it in the lens tube, the size of the objects can be increased to acceptable proportions. This plan is also very useful when making yacht pictures from shore, it is a modification of the story of "Mahomet and the Mountain." The greatest advantage of the use of these lenses is that they are cheap. Almost any optician will furnish them of whatever focus desired, with edges ground, at twenty-five cents each, and, if they are all made the same diameter, one adapting ring in the lens tube will answer for all.

One objection, however, should not be overlooked, and that is, the addition of an uncorrected lens will naturally interfere with the correction of the original lens; but, where the change in focus is slight, the interference will not be noticed. An increase in length of focus of thirty or thirty-five per cent. should not affect the result to any great extent, but, when it is necessary to change the focus more than that, an achromatic lens should be used.

A. L. EIDEMILLER.

THE BICHROMATE INFECTION.

THE so-called bichromate disease (*Chromkrankheit*) has of late attracted serious attention in some parts of Germany, on account of its frequent occurrence among the workmen engaged in photo-lithographic and Lichtdruck establishments. This malady is not altogether a new one, as it dates from the time when the chromate processes were discovered.

Strange to say, thus far no specific remedy has been found that will actively counteract the poison and prevent infection.

The malady, up to the present time, has baffled the most skilful physicians of all schools. It is true that various remedies have been suggested, and which, it is claimed, will ameliorate the malady, but none have been brought forward that will eradicate the poison from the human body.

It is one of the characteristics of the bichromate infection that it courses through the body in the same manner as a swallowed needle, seeking to find some convenient outlet, but woe to the patient if, in its course, the virus meets with a disorder of a scrofulous nature.

Dr. John H. Janeway, U.S.A., describes this malady* as "a troublesome and oft-time serious disease, affecting all parts of the body exposed to contact with bichromate of potash, either in solid or liquid form. With the latter form, contact with an abraded surface is followed by tingling or smarting, heat or soreness at some small spot on the finger or hand. Continued exposure, by dipping the hand in a solution or handling the dry salt, increases the effect and excoriation. Obstinate in their character appear these continual symptoms — eczema or psoriases on the hands, in the flexures of the joints, and in different parts of the body. Oft-times boils, hard and painful, and obstinately slow, make

* *American Amateur Photographer*, vol. iii. p. 38.

their appearance. Frequent crops of these appear without any apparent cause. The fine dust arising from the friction of the crystals, inhaled by the nose or mouth, even in very minute quantities, often gives rise to a distressing and obstinate catarrh, and workmen in factories where the bichromate is manufactured have been known to loose the septum of the nose. The obstinacy of the disease is characteristic, and the person's life is rendered miserable for a long time by its persistency and liability to return. The greatest care is therefore necessary in handling this salt, whether in its dry state or in solution. In sensitising, one should always use Indiarubber gloves, and, above all, it is necessary to avoid all excesses in living. During development, expose the hands as little as possible to the bichromate, especially in winter, when the hands are liable to be chapped, for the poisonous action of the salt is rapid and disastrous."

M. Beaumois, an operator of more than usual experience, recommends the daily use of the following mixture, which he employs with success upon his own hands :—

Glycerine	½ ounce.
Carbolic acid, C. P.	10 drops.
Water	2½ ounces.

Another suggestion made, is to mix this solution with a boraeic salve (*Borsalbe**), with which the whole body is to be anointed before retiring for the night. The body is to be thoroughly rubbed with the ointment, which is then allowed to dry. Naturally this must be done in a warm room to prevent taking cold.

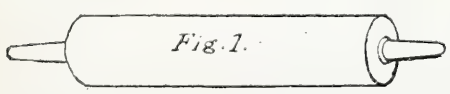
But, where the disorder is once seated, even this is of no avail. During the course of infection, the condition of the blood is of great moment. A person liable to the bichromatic poison will frequently have a confirmed case of the disorder in less than a week from working with bichromate solutions, especially if such are used in connexion with gummy substances, or where the solutions are of a high percentage.

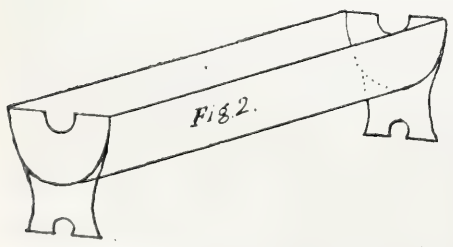
The photo-mechanical branches of photography are especially conducive to the spread of this strange malady. First upon the list is the sensitising of paper for the various photo-lithographic processes, which require the use of a five per cent. solution. Less dangerous is the sensitising of pigment tissues, which require but a two to three per cent. solution. The same is the case with the ordinary half-tone processes on zinc and copper.

The preparation of the second tissue for the Lichtdruck process involves a greater risk. The most dangerous, however, is the so-called American enamel, or fish-glue process, for photo-mechanical work, as this method not only calls for a high percentage of the bichromate salts (fourteen ounces to 200 c. c. of solution), but to make matters worse the sticky substance, with which the poison is combined, makes it a source of constant danger to the operator, as the mass is apt to adhere to the skin, when the poison is quickly absorbed into the system.

There is one preventive, which, from its simplicity and cheapness, is neglected by the majority of operators; this is nothing else than cleanliness, and it may be said that only in rare instances will a careful operator become infected if he practises scrupulous cleanliness. Yet cases are on record where all precautions have failed.

Fortunately a malady of this kind is easier to prevent than to eradicate. For the purpose of overcoming all danger of infection in the preparation of bichromatised paper, Herr C. Fleck, an ingenious German, has lately constructed a simple and practical contrivance.† This consists of a trough of japanned tin (fig. 2), and a wooden roller (fig. 1). This apparatus can be used for silvering as well as bichromatising; all that is requisite is to pour a sufficient quantity of the solution into the trough, and the paper or tissue is fastened on the roller with thumb tacks. After the paper is dusted, the roller is placed into the grooves at the end, and is slowly turned; the roller is then taken out, and held by the end over the trough to drain the surplus solution, after which it is placed in the dark room, and left to dry upon the roller. As many rollers are necessary as sheets of tissue are to be sensitised at one time.





The advantages of this simple apparatus are as follows :—

1. Ease in dusting, and an even coating of the paper or tissue.
2. No staining of the hands with silver or bichromate.
3. It obviates all danger of bichromate infection.
4. There will be no more complaint about blisters or uneven sensitising.

J. F. Sachse.

—*American Journal of Photography.*

* *Photographische Chronik*, vol. ii. p. 186

† *Photographischer Almanack*, 1895, p. 56.

A HOLIDAY IN MANXLAND.

[Hackney Photographic Society's Journal.]

It is very surprising to think how many people go abroad for a holiday, fully persuaded that there is better scenery away than in Great Britain. Perhaps it is the novelty, but, whether or no, our next Exhibition may prove whether the pictures "made in furrin parts" are better than "natives." Some of our members have visited the Isle of Man lately, and have been fully satisfied and pleased with the delightful scenery there. To my mind there is no place which offers so much for a camera in so small a compass, or such good, bracing air; and, if one wishes to go for a "setting up," there's the spot. Many people object to the sea passage of three and a half hours, but I have made many journeys there and have invariably had it calm and enjoyable. At the present time it is an economical place to visit, for trips are constantly being advertised by the Midland and North Western Railway Companies for about 21*s.* or 25*s.* for a ten days' holiday, or, if a longer stay is desired, a tourist's ticket, available for two months, is issued at 39*s.* The route I prefer is *viâ* Liverpool, and, if the start is made on a Saturday, a train can be taken starting at 10.10, arriving in Liverpool about 2.30, and allowing about two and a half hours there, which can be spent in parading the town and seeing the sights, or "snap-shotting" on the Mersey may be indulged in. Leaving at five o'clock by one of the magnificent steamers of the Isle of Man Steampacket Company, we arrive at Douglas about 8.30. The journey is by no means a tedious one, for the sea journey relieves the monotony of the previous train trip.

Now the question arises, what sort of a seaside place do you like, quiet or lively? If you like life, then stay by all means at Douglas, where there is an excellent theatre, two circuses, and many good entertainments of the variety order. Many eminent artists appear there in the summer, and during the present season Edward Lloyd, Sims Reeves, Ben Davis, Belle Cole, and Gomez have, among others been engaged. The promenade is rather too crowded for my taste, and any one who likes quietness at night would do well to secure their apartments at either Mrs. Tonge's, Derby-road, or Mrs. Corris, Lhen House, Derby-road, at which places several of our members have stayed, and, I believe, at very moderate charges. Douglas is, perhaps, the best place to stay at, as, being central, any place is easily reached; but, of course, being the chief town of the island, the great body of visitors stay there, so that, should you desire *absolute* peace and quietness, then make Peel your stopping place, and you will not be disappointed.

The best cameras to take are hand and stereoscopic cameras, and *backed* plates are advisable, as the principal scenery is "glen work," with excessive contrasts, and halation is sure to come without some preventive being employed.

Dark Rooms at Douglas.—Qualtrough, chemist, Buck's-road; plates, Paget and Ilford. Brearey, chemist, Prospect-hill; plates, Thomas and Ilford.

Now for a programme for the camera. Incidentally let me say *afternoon* is generally the best time to photograph in, the glens being freed from visitors then.

1*st Day.*—Morning (hand camera), Douglas Head and Harbour. Plenty of work. Afternoon, electric car to Groudle Glen (stereoscopic camera).

2*nd Day.*—Take a carriage to Sulby Glen, *viâ* Keppel Gate. This is a very fine drive, perhaps the best to be had, but it is a *sine-quâ-non* to have a fine, *clear* day, as much of the mountain scenery is otherwise lost. Take stereoscopic camera.

3*rd Day.*—Train (ask for book of tickets, as it is more economical) to St. John's, then carriage (6*d.*) to Glen Helen, and, if time allows, go to Peel. Both cameras would be useful.

4*th Day.*—Steamer, *Manx Fairy*, to Laxey (where the great wheel is), after which carriage to the Dhoon Glen, a very steep glen. Return home from Laxey by electric car. Stereoscopic day.

5*th Day.*—Train to Castletown for an hour or two, then on again to Port St. Mary. Engage small boat and boatman, and row to caves and chasms. Discharge boatman and scramble up the rocks to the top; go to the chasms (worth seeing), after which walk through the village of Craignich (a very quaint little place), on to Port Erin, and home from there. Hand camera day. Necessary to have calm, bright day, *and to start early.*

6*th Day.*—Steamer, *Manx Fairy*, to Ramsey, and, if time permits, visit Glen Auldyn. Hand-camera day.

7*th Day.*—Train to St. John's, and from thence by car to Glen Maye. Stereoscopic work. I would advise taking a tripod to use with hand camera.

These are the main routes on the island, and there are many others worth doing off the beaten track, but the above will suffice as a preliminary canter.

Should our traveller desire, he can visit Belfast, Dublin, and many other places, as trips are always taking place; in fact, the island seems to form a sort of connecting link between England, Ireland, Scotland, and Wales.

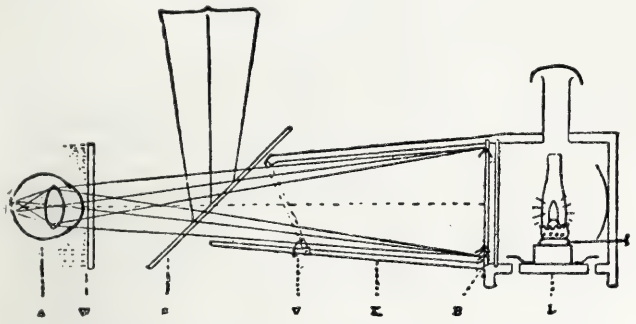
Perhaps the best time to visit Manxland would be either in June or September, for, during the former month, the evenings are long, and the trees and flowers are in a state of perfection, whilst in September they are arrayed in all their autumnal beauty. W. FENTON-JONES.

PHOTOGRAPHY OF THE RETINA.

[Scientific American.]

THIS apparently impossible feat has been performed several times, having been first accomplished in 1893 by M. Londe, a member of the French Société de Photographie. We translate from Gaea, Leipsic, May, an account of an improved method used with great success by Drs. Grebe, of Cassel, and Greeff, of Berlin.

"The eye to be photographed, A (see illustration), is furnished with a



water cell, W, according to Gerloff's system, to avoid reflection from the cornea. Before it a clean plate of glass, S, is so placed that the rays from the source of light of the desired intensity can be thrown by it into the eye. At P is a sensitive plate that is sheltered from outer light by means of a box, K. The box can be closed by a pneumatic shutter, V. On the plate, P, are cross lines which, when the plate is illuminated by the red lantern, L, can be seen by the eye.

"The feat is performed in the following manner: The eye is brought to perfect rest by means of a head support. Then the glass plate is so turned that a provisional point of light above appears to lie in the middle of the shutter, V. Then in perfect darkness the shutter, V, is opened and the eye is focussed on the cross wires of the red-illuminated plate. Everything is now ready for the photography, which is accomplished by flashlight.

"The procedure can be understood without further explanation. With a minimum of light quite a large picture may be taken directly; the focussing is the sharpest imaginable, because it is done with the eye itself. The smaller the picture the sharper will be the outlines. Near-sighted eyes are very good for photographing."—*Literary Digest.*

PHOTOGRAPHIC COPYRIGHT AND THE ILLUSTRATED PRESS.

OUR admirable contemporary, the *Publishers' Circular*, in an interview with the Editor of the *St. James's Budget*, has extracted the following interesting remarks on photographic copyright from that gentleman:—

"The law of photographic copyright is enough to turn anybody's hair grey; but, thanks to the friendly co-operation of most of the great firms of photographers, and perhaps to natural caution, I have succeeded in safely steering my barque through the shoals and quicksands of copyright."

"It is said that the public are growing tired of photographs."

"I have a strong opinion on that subject. I still think that photography will continue to play a very large part in the production of illustrations for newspapers; indeed, I can perceive no present indication of a lessened popularity for papers largely illustrated by photography. The fact is, that the public now insists upon its illustrated papers consisting of a great number of pages filled with scores of blocks. It is no uncommon thing for the *St. James's Budget*, or one of its rivals, to present its readers with seventy or eighty, or even more, illustrations in a single number. It is obvious that comparatively few of these illustrations can be from artists' drawings, since the expense would be prohibitive. Even as it is, and with all the assistance given by the greater cheapness of photographs, the cost of producing an illustrated paper consisting of forty-eight pages may be fairly described as enormous, especially if many of the illustrations deal with current events. Nothing costs so much to illustrate as the news, since, even if it be done by aid of the camera instead of the pencil, special photographs have to be taken, frequently abroad, with concurrent expense. As to copyright in photographs, I am bound to say that, when the photographer is honest and straightforward, as happily most of them are, and an editor approaches the matter like a man of business, there is usually very little difficulty. Unfortunately, many of the smaller provincial photographers have very hazy notions as to what constitutes effective copyright. The extensive use of photographs is not, after all, so cheap as many people suppose."

"When we began the *St. James's Budget* as an illustrated paper, the Photographers' Copyright Union had not come into existence, and I am well within the mark in saying that the additional expense to which it has put us runs well into four figures every year. For wood-engraving I see no possible *renaissance* as regards weekly papers, although its cost is now not much more than the cost of process blocks was a few years ago."

TESTS FOR SODIUM THIOSULPHATE.

AT the conclusion of my former paper on this subject I made mention of the permanganate test, and spoke of it as being peculiarly well suited to the requirements of the photographer. As may be inferred from those remarks, it is essentially a simple test, and, moreover, one of the utmost delicacy. So delicate indeed is it, that by its means I have found it comparatively easy to detect a mere trace of thiosulphate, and one of the presence of which the iodine and starch test, though carefully and repeatedly applied, gave no indications whatever.

When a moderately strong solution of potassium permanganate is treated with a weak solution of a thiosulphate, the deep clear violet colour of the former is changed to a rich and turbid crimson. A stronger solution of the thiosulphate, or, what amounts to the same thing, an excess of the weaker solution, produces an orange colour, the semi-opacity of the liquid becoming at the same time still more pronounced. According to some chemical authorities the permanganate solution should be acidified. In my experiments (which have, however, been confined to the examination of washing waters) I have always employed a neutral solution, and have found it sufficiently efficacious for all practical purposes. This standard permanganate solution I make up by dissolving one grain of pure crystallised potassium permanganate in two fluid ounces of distilled water. Owing to its corrosive action on organic matter of all kinds, the solution must be preserved in a bottle with a glass stopper.

In order that I might have a means of approximately estimating the quantity of thiosulphate present in any given sample of washing water, I made some preliminary experiments with two thiosulphate solutions of known strength. The stronger of these solutions I formed by dissolving one grain of crystallised sodium thiosulphate in half a pint of water. The weaker solution was made up by adding one fluid ounce of the first solution to nine fluid ounces of water. The test was applied in the following manner:—

Two small test tubes supported in an upright position by wire rings were placed side by side on a sheet of white paper illuminated by diffused daylight. Twenty minims of the standard permanganate solution having been measured into each tube, a few drops of distilled water were added to the coloured liquid in the first tube, and an equal volume of the weaker of the thiosulphate solutions to that in tube number two. The violet colour remaining unchanged, more distilled water was cautiously dropped into the one tube, and more thiosulphate solution into the other, care, of course, being taken to ensure equality of dilution throughout these operations.

These additions were continued until the violet colour of the liquid in the second tube was changed to crimson. Twenty-six minims of the thiosulphate solution were found to be be required to produce this result. Since each drachm of this solution contained only ·00125 of a grain of the crystallised salt, it will be seen that the quantity of thiosulphate actually identified in this case amounted to little more than the one-eighteen-hundredth part of a grain. I then tested the stronger thiosulphate solution. Taking as before twenty minims of the standard permanganate, I added a little distilled water to the contents of each tube in order to make the reaction more visible. On applying the test, I found that the addition of from two to three minims of the stronger solution, or something like one-sixteen-hundredth to one-two-thousandth part of a grain of thiosulphate, produced the crimson colour. From the difficulty experienced in judging of the quantity actually present, it was evident that the solution was too concentrated for testing purposes. Fifteen minims of the said solution (equivalent to ·003125 grain of the salt) gave a rich orange, and thirty minims (·006250 grain) a muddy yellow colour.

In order to judge of the amount of accuracy with which the test

could be carried out in the case of an extremely dilute solution, I then prepared a third stock test by adding one fluid ounce of the weak solution formerly employed to nine fluid ounces of water. Each fluid ounce thus represented only the one-thousandth part of a grain of thiosulphate. On treating twenty minims of the standard permanganate with this solution, no less than thirteen fluid drachms had to be added to produce the characteristic crimson hue. The colour of the test liquid was, however, greatly weakened by this excessive dilution, and in consequence the point at which the change of colour was produced could only be guessed at. The rough estimate of thirteen drachms represented about the one-six-hundredth part of a grain of sodium thiosulphate.

These experiments serve to give a fair indication of the capabilities of the permanganate test. They show that it may be employed to identify a quantity of thiosulphate ranging from the one-six-hundredth to the one-two-thousandth part of a grain in weight. In testing washing waters it is, of course, very important that we should do all that we can to make the reaction as delicate and distinct as possible. The later samples of water from the washing vessels must therefore be evaporated down to a third or a fourth of their original bulk before the test is applied. Except in cases in which the washing operations are carried out on a large scale, the first two or three waters (which are bound to contain a large percentage of thiosulphate) need not be tested.

When these precautions are duly observed, the photographer will find that, after a very little practice, the detection of the one-sixteen-hundredth part of a grain of thiosulphate may be easily and expeditiously accomplished.

A still smaller fraction of a grain of the salt may, if necessary, be identified by simply substituting a less volume of the permanganate solution for that above mentioned; say, for instance, ten instead of twenty minims.

In such a case, one or two experiments with weak thiosulphate solutions of known strength will afford the operator the means of estimating to what extent the delicacy of the test has been increased. Enough, however, has already been said to fully illustrate the manner in which these experiments should be carried out.

The barium chloride test now deserves notice.

When a solution of a thiosulphate is added to one of barium chloride, a white precipitate of barium thiosulphate is produced. This precipitate is very sparingly soluble in an excess of cold water. It is more soluble in warm water, and still more so in boiling water. When treated with dilute hydrochloric acid, the precipitate is decomposed and dissolved. In course of time the acid solution, if permitted to stand, deposits sulphur. It unfortunately happens that this test cannot well be made a quantitative one. Notwithstanding this disadvantage, there are, nevertheless, certain circumstances in which the photographer will do well to avail himself of its aid. For instance, it may be applied with the object of detecting the presence of thiosulphate in the finished print. A few clippings of the print which is to be tested should be well soaked for an hour or two in half an ounce of distilled water. After decanting, and if necessary filtering, the liquid, the test is to be applied in the usual way. On the other hand, samples of washing waters containing, or suspected to contain, thiosulphate, ought not to be tested with barium chloride. Most waters contain a certain small percentage of soluble sulphates.

Not only will the chloride precipitate as barium thiosulphate any sodium thiosulphate present in the sample, but it will also, at the same time, precipitate these sulphates in the form of barium sulphate. This being so, it is evident that the one precipitate may be very easily mistaken for the other, the one for both, or the mixture of both for either sulphate or thiosulphate. True, the precipitated thiosulphate dissolves freely in hydrochloric acid, whilst, on the other hand, the precipitated sulphate is insoluble in that reagent; but, since the test is purely qualitative, the photographer can hardly avail himself of this means of identification.

In the case of washing waters, therefore, other tests are to be preferred.

Next, there is the chromic acid test.

When a solution of a thiosulphate is added to an acidified aqueous solution of chromic acid, a dark-green gelatinous precipitate of hydrated chromium sesquioxide is instantly formed.

The chromic acid test solution may be prepared by dissolving 44 grains of potassium bichromate in one fluid ounce of water, and adding to the cold solution 12 drachms of concentrated sulphuric acid of sp. gr. 1·84. When cold, the clear liquid is to be decanted off. The crystalline residue, consisting of chromium trioxide, must then be dissolved in ten fluid ounces of water previously acidified with a drachm of concentrated sulphuric acid, and the solution preserved for use in a stoppered bottle.

When experimenting with this test, the photographer must be careful to remember that not only a thiosulphate, but organic matter of any kind, at once reduces the acid to the state of sesquioxide. The test cannot therefore be applied to the prints or films, but only to the washing waters.

According to Fresenius, if the solution is not acidified, a brown colour is produced on the addition of a thiosulphate, and when the liquid is heated a brown precipitate of chromate of chromium separates.

Yet another test is that with zinc and hydrochloric acid.

When pure zinc is treated with hydrochloric acid in the presence of a thiosulphate, a mixture of hydrogen and hydrogen monosulphide is evolved. The experiment may be conveniently carried out in a tubulated gas-generating bottle. At least two ounces of each sample of washing water will be required. The characteristic odour of sulphuretted hydrogen enables that gas to be easily distinguished from hydrogen when the two gases are evolved together. Its detection may also be effected by holding in the stream of the mixed gases a strip of blotting-paper recently moistened with a strong solution of acetate of lead. A mere trace of the monosulphide will blacken the paper.

Of the few remaining tests for the thiosulphates, the ferricyanide test is, I think, the only one of sufficient importance to deserve a particular notice.

When a solution of ferric chloride is mixed with one of pure potassium ferricyanide, a dark oak-brown solution is produced. If to this liquid a few drops of a weak solution of a thiosulphate are added, a dense blue precipitate immediately separates. A green colour is produced when the quantity of thiosulphate is very minute. For testing purposes, five grains of crystallised potassium ferricyanide should be dissolved in one fluid ounce of water. Each fluid ounce of the ferric chloride solution should contain thirty-two grains of the salt. Equal measures of these solutions are to be thoroughly mixed in a white porcelain basin. After mixing, half of the contents must be poured into a second basin. The sample of water to be tested may then be added drop by drop to the contents of basin number one. The contents of the second basin are to be gradually diluted with distilled water, added at the same rate. These operations must be continued until a distinct difference is perceptible between the colours of the respective solutions.

MATTHEW WILSON.

(To be continued.)

News and Notes.

RHYL.—Mr. G. R. Lawrence, pharmaceutical chemist, of 20, High-street, Rhyl, informs us that he has fitted up a dark room for the use of amateurs.

INTERNATIONAL EXHIBITION OF AMATEUR PHOTOGRAPHY, BERLIN, 1896.—In August and September, 1896, an Exhibition of amateur photography, under the patronage of H.I.M. the Empress Frederick, will be opened in Berlin in the building of the new House of Parliament (Reichstag).

"PHOTOGRAPHY, ARTISTIC AND SCIENTIFIC."—This is the title of a new manual of photography, by Messrs. Robert Johnson & A. B. Chatwood, which Messrs. Downey & Co., of York Street, Covent Garden, will publish immediately. It will have about thirty pages of photographic illustrations.

THE PHOTOGRAPHIC AND PROCESS EXHIBITION IN LEEDS.—The Photographic and Process Exhibition, which opens at the Leeds City Art Galleries on September 23, promises to be successful in each of its three departments. There is no doubt that in Section I., dealing with general photography, will be exhibited works by the best photographic artists, that will astonish those who have only been accustomed to the highly polished photograph of commerce. In Section II., the "Black and White" drawings will be by all well-known men, Mr. F. Carruthers Gould, of the *Westminster Gazette*, having specially promised a set of his well-known caricatures. In Section III. it is believed that the exhibition of the various photo-mechanical processes will be the most complete that has been held for some years, and special exhibits are expected to be received from the Imperial State Printing Works at St. Petersburg. A special feature will be made of photo-ceramics, and it is expected that the whole of the exhibits from the Imperial Institute will be sent *en masse* to the Leeds Exhibition. It is intended that the catalogue should contain specimens of process work in each branch, and that each impression should be printed under the control of the maker of the block, so that process in its very best aspect will be seen. The committee have in view the engagement of a considerable body of prominent lecturers, who will deal with subjects each Saturday during the Exhibition. Mr. Muybridge, the author of the wonderful work *Animal Locomotion*, which cost the city 300 guineas last year, has already been engaged. It may be added that the Leeds Photographic Society, under whose superintendence the Exhibition is being formed, will have a competition open to their members amongst the works sent in by them to the open classes of the Exhibition.

ERRATA.—In the leading article on *Residues from Fixing Baths* in last week's issue, two printer's errors occur, which deserve correction. In the fifth line of the third paragraph, for "heated" read *treated*, the treatment consisting in boiling with caustic potash. In the fourth paragraph, fifth and sixth lines, on page 531, for "left on the metallic slate," read *left in the metallic state*. To those who are alike familiar with the chemical reactions and the vagaries of printers, these mistakes will be sufficiently obvious, but to some they may be perhaps incomprehensible.

SOUTH AUSTRALIAN PHOTOGRAPHIC SOCIETY.—The following are the officers of this Society:—*Patrons:* Hon. Sir E. T. Smith, K.C.M.G., M.L.C., Sir Charles Todd, K.C.M.G., Hon. Dr. J. A. Cockburn, M.P., Professor E. H. Rennie, M.A., D.Sc., Professor W. H. Bragg, M.A., and Mr. J. J. Green.—*Past Presidents:* Messrs. S. J. Dailey, G. Stace, and C. F. Clough.—*President:* Mr. E. W. Belcher.—*Vice-Presidents:* Messrs. A. W. Dobbie and A. Scott, B.A.—*Committee:* The Executive Officers and Messrs. G. Stace, A. H. Kingsborough, and J. Gazard.—*Hon. Treasurer:* Mr. R. B. Adamson, Belgrave-terrace, College Town.—*Hon. Secretary:* Mr. P. A. Roberts.—*Hon. Assistant Secretary and Librarian:* Mr. H. M. Paterson, c/o Cooke, Paterson, & Co., Australasia Chambers, Adelaide.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 15,631. "A Photographic Mount for Memorial, Wedding, or other Greeting Cards." J. W. BARRS.—*Dated August*, 1895.

No. 15,706. "Improvements in and connected with Photographic and Lantern Portable Tripod Stands." Messrs. W. BUTCHER & SON (W. BUTCHER and W. F. BUTCHER).—*Dated August*, 1895.

No. 15,714. "Improvements in or relating to the Production of Photographic Transparencies or Positive Pictures." F. STERNBERG.—*Dated August*, 1895.

No. 15,846. "Improvements in Joints for Fishing-rods, Easels, Camera Stands, and other Purposes." J. PUMPHREY.—*Dated August*, 1895.

No. 15,882. "Improvements in or connected with Photographic Shutters." Complete specification. F. A. BROWNELL.—*Dated August*, 1895.

No. 15,934. "Self-stripping, Print-out Gelatine Dry Plates." A. HILL.—*Dated August*, 1895.

No. 15,935. "Improved Means of obtaining Photographs in true Relief in Gold, Silver, and other Metals." A. HILL and A. A. BARRATT.—*Dated August*, 1895.

PATENTS COMPLETED.

IMPROVEMENTS IN PHOTOGRAPHIC CAMERAS.

No. 3197. CHARLES HOWSE, 24, Gratitude-road, Easton, Bristol, Gloucestershire.—*July* 27, 1895.

MY invention relates to improvements in hand cameras for photographic purposes, and has for its objects a combination of parts and an economical arrangement of same by which the artist is enabled to carry a larger number of sensitised plates or films in a given space, and place the same one at a time in position for exposure, and aside after such exposure, more quickly and with less liability to breakage than obtains with cameras of a like nature hitherto made and used, and which I intend shall be commercially known as the "Climax Hand Camera."

My invention consists of a preferably rectangular outer case or container, in one end of which is provided a suitable and, may be, interchangable lens, fitted with any form of shutter, while in its upper surface is located a suitable range finder, operated in the usual way, a handle being fixed to the said case by which the whole may be carried.

Within the said case a space is set apart for the reception of a wood or other block, to which is pivoted upon a wire, and bound thereto in similar manner to that of leaves in a book, any number of carriers or frames made of xylonite, celluloid, or other like thin and transparent material, which are arranged to receive and hold a like number of sensitised plates or films, and so constructed that the whole of said carriers and their plates or films may be held in a horizontal position, one upon the other, by the means of a similarly disposed hinged platform or frame arranged to fall and permit the lowest or under one of said plates or films, and its carrier, to fall into a vertical position, when released, by the movement of a sliding spring-retained plate, or its equivalent, operated by a handle or other device, and its accessories upon the outer side or other convenient part of the said case or container. The said fallen and now vertical plate or film is now in a position for exposure, after which operation the same and its carrier is pushed or drawn beneath the before-mentioned block by the means of a spring bolt or its equivalent, thus leaving room for the next, and the rest of the horizontally retained plates and carriers to be lowered in like order, until all have been exposed, when the said carriers may be again charged with a like number of plates or films. The exposed plates may be removed and developed either during or at any time subsequently to the exposure of them all.

Suitable hooks, rods, plates, levers, and springs may be employed when required to hold, assist in moving, or retaining before or after moving, any of the operative parts of the entire apparatus.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
2	North Middlesex	Informal Meeting.
2	Peterborough	
2	Putney	
2	Richmond	
2	South London	*Toning Baths.* E. J. Wall.
2	Stereoscopic Club	
3	Birmingham Photo. Society	
3	Brixton and Clapham	
3	Exeter	
3	Gospel Oak	Presto Paper Demonstration.
3	Hackney	
3	Herefordshire	
3	Lewes	
3	North London	
3	Oxford Camera Club	
3	Paisley	
3	Rotherham	
3	Sheffield Photo. Society	
3	York	
4	Leytonstone	
4	Photographic Club	
4	Southport	
4	Southsea	
5	Birmingham Photo. Society	
5	Glossop Dale	
5	Hull	
5	Leeds Photo. Society	
5	London and Provincial	
5	Oldham	
5	Tunbridge Wells	
6	Brighton and Sussex	
6	Cardiff	
6	Croydon Microscopical	Conversational Meeting and Results of Lingfield Excursion.
6	Holborn	
6	Leamington	
6	Maidstone	
6	North Kent	
7	Croydon Microscopical	Excursion: Beddington, the Wandle, and Neighbourhood. Leader, H. D. Gower.
7	Hull	
7	Newton Heath	Excursion: Disley. Leader, Mr. Winterbottom.
7	South London	Exc.: Chingford. Leader, J. T. French.

Hackney Photographic Society.—August 20, Mr. William Rawlings presiding.—The feature of the evening was a paper read by Mr. Fenton-Jones on *Home Portraiture*. At its conclusion a long discussion ensued.

North Middlesex Photographic Society.—August 26 was an Ordinary Meeting.—Mr. Charles R. Steele in the chair.—Mr. LABOSHEZ, of the Eastman Company, attended and demonstrated their platino-bromide paper, a paper designed to give the appearance of platinum prints, with their rich blacks, fine half-tones, and pure whites, with the ease of working of bromide paper. He showed many specimens of work, and developed some prints he had brought with him, using the ferrous-oxalate developer for preference, saturated solutions one to six. He also developed others with rodinal, and stated that any of the newer developers, amidol, metol, rodinal, &c., would give good results. He afterwards toned some prints in a hot bath, composed of water, 80 ounces; hypo, 10 ounces; alum, 1 ounce, at a temperature of 120° Fahr. and upwards. They resulted in pleasing browns and sepias, which he stated his Company believed to be permanent. He proved the inadvisability of having prints developed by different developers in the toning solution at the same time without thorough previous washing, by showing that, if this were done, the toning solution would discolour and stain the prints.

Doncaster Camera Club.—August 19.—A paper was read by Mr. WOODLEY on the *Development of Gelatino-chloride Paper*. After describing the process, the lecturer produced three partially printed-out photographs, and successfully developed the image to the required density, showing how a modification of the constituents of the developer might be made to compensate for excessive hardness or softness in the negative printed from. The photographs were afterwards toned in the usual manner. Great interest was shown in the demonstration by those present, and a hearty vote of thanks was accorded to the lecturer.

Northern Tasmanian Camera Club.—The Sixth Annual Meeting of this Club was held in the Club-room, Albert Hall, on Wednesday, July 17. The President (Mr. R. C. Kermode) occupied the chair, and there was a large attendance.—Mr. Rowe was elected a member. Annual Report: The Hon. Secretary then read his annual report in which he stated that the Club was still in a most prosperous condition, the number of members on the roll during the year being 44—26 town and 18 country. The monthly meetings had been well attended throughout the year and much good derived from the practical work done at these gatherings. Two Club competitions had been held during the year, the prize-winners being Messrs. Birchall, Gibson, Parker, and Styant-Browne. In competitions outside the Club ranks members had been most successful, securing no less than nineteen awards, eleven being obtained at the Geelong Exhibition of Photography, Messrs. Birchall, A. Green, Kermode, Larner, Parker, Sparrow, and Styant-Browne being the successful competitors. Regret was expressed at losing some of the prominent members of the Club, namely, the Revs. Champion, Anderson, and White, and Dr. H. A. Roome. The Treasurer's report and balance-sheet was deemed satisfactory, as expenditure was well within the income, and the

library was still very well patronised. The President, in moving the adoption of the report, said he felt proud of the Club, which had never been in a better condition than at the present time, and could well hold its own against any competitors. Election of Officers: The office-bearers for the ensuing twelve months were then balloted for with the following result:—*President:* Mr. R. Lewis Parker.—*Vice-Presidents:* Messrs. R. C. Kermode, C. Nickalls, W. H. Twelvetrees.—*Committee:* Messrs. J. Sparrow, J. A. Larner, and C. Hart.—*Secretary, Treasurer, and Librarian:* Mr. F. Styant-Browne. A hearty vote of thanks was accorded to the office-bearers of the last year, to which Messrs. Kermode and Styant-Browne suitably responded; also to the ladies Social Committee who had done so much to ensure a successful gathering, which was carried by acclamation. Future programme: The programme for the next six months, which included a field-day on Prince of Wales's birthday, was arranged; due notice also given that next March a "snap-shot" album for hand-camera work would be arranged for. As many members now are working in this direction, a good competition should result. It was decided to invite interchange of lantern slides with kindred associations in the colonies. The question of holding an Exhibition in Launceston next autumn, inviting competitors from the other colonies, was mooted and deemed feasible, and the first steps towards this object taken.

Port Elizabeth Amateur Photographic Society.—The Annual Meeting of this Society was held in the Trinity Hall on Thursday evening, the 18th inst., when a large number of members were present. After the reading of the minutes, Mr. Harmsworth was unanimously elected a member, and was welcomed to the Society in a few well-chosen words by the President (A. Walsh), to which Mr. Harmsworth suitably replied. The presentation of certificates to the winners of the April competition was next proceeded with. This competition was judged by the Kimberley Camera Club, Mr. H. J. Thompson being awarded first place in the seniors, and Mr. A. Jones first place in the juniors. The suggestion of the Committee to alter certain rules was resolved upon, and thereupon the Secretary read the annual report, of which we append a copy:—"Your Committee have much pleasure in submitting to the members the annual report of the Society. Since the last report was issued, in July, 1894, the Society's place of meeting has been changed, and it is gratifying to your Committee to know, from the increased interest taken by the members in the doings of the Society, that this change has been one of benefit to all. The meetings held during the year were 19, and the average attendance 16, the greatest number at any meeting has been 22. There are 67 members on the roll, but out of these 6 are at present travelling, 6 live permanently in the country, and 7 have resigned, so that taking this 19 from the 67 leaves 48 active members. While thanking those members who have been regular in their attendance, your Committee still consider that, out of a possible 48, a larger attendance could easily be recorded. Many members who are known to take a keen interest in photography and the Society have been somewhat lax in their attendance, and it is to be hoped, with the greater facilities which this new hall affords, that an increased attendance for the incoming year will follow as a natural sequence. The Treasurer's balance-sheet shows a credit balance which your Committee consider highly satisfactory. A new departure was inaugurated on November 23, 1894, when the Society gave a *conversazione*—invitations by special ticket—in place of the usual entertainment, which has always followed your annual general meeting. Your Committee cannot speak too highly of the manner in which all members came forward to help towards its success, and the result exceeded their expectations, for a most enjoyable evening was spent. Views of colonial scenery were shown by limelight, contributed by members and by the Capetown and Kimberley Societies, to whom thanks are due for their kindness in lending a quantity of interesting slides. The annual outing of this session was arranged for the Kowie, where a large number of views were taken, and the trip proved a most enjoyable one. Thanks are due to the Traffic Department of the Cape Government Railway for their admirable arrangements for conveying the members, and also to Mr. Putt, of the Dowie Railway. In June, 1895, the Society received, through the Capetown Society, the prize slides belonging to the *Lantern and Camera Review*, and which were shown in the Town Hall on June 13, 1895. As regards these slides, your Committee consider them the best set ever shown here, and in consequence they were very much admired by a large and enthusiastic audience. The net balance of this, along with the former entertainment, your Committee have placed to the credit of the building fund as a nucleus towards the amount which will be required should the Athenæum scheme be carried through. The following certificates have been awarded during the year:—Mr. McIlwraith, in quarterly competition during August, 1894; Messrs. Thompson and Jones, in competition during April, 1895. Your silver medal competition, open to all photographic societies in South Africa, was awarded to one of your own members (Mr. W. Scruton), with Mr. West as a good second, and it is undoubtedly gratifying to be able to record this. The demonstrations have been very successful in enlisting the interests of members, and have been delivered throughout with great clearness and perspicuity. In August, 1894, Mr. Newbold, your late Secretary, commenced the series by a paper upon *Lantern-slide Making*, using metol as a developer, and from which he obtained good results. Mr. Davis followed, in December, 1894, by a paper on *Platinum Toning of Gelatino-chloride Papers*, using a combined bath of chloride of gold and chloro-platinite of potassium, the resulting tones of which varied from a rich brown to a clear, deep black. Mr. West then gave, in February, 1895, an interesting paper upon the *Cyanotype Process*, and its usefulness in the copying of plans and tracings. Mr. Davis, in March, 1895, gave a paper upon the *Swing Back*, detailing its various uses; and this paper was again repeated in your new hall for the edification of those members who were unable to be present at the first reading. In June Mr. Alcock gave a paper upon *Platinum Printing*, showing the manipulation of the process in a practical manner; also, in this month, Mr. West gave a demonstration upon *Lantern-slide Making by Contact*, using pyro-ammonia as a developer, and explaining that he found metabisulphite of potassium the best preservative for pyro. This was followed in July by Mr. Davis giving a paper upon *Lantern-slide Making by Reduction*. All these papers were of a practical nature, and the results of the experiments shown at the various meetings. You have had presented to you during the year a neat oak ballot box by Mr. W. Scruton, and a useful and handsome cabinet for holding the properties of the Society by Mr. J. Lewis. Both these gentlemen deserve the best thanks of the members for their suitable gifts. A question box was started for the use of the junior members, and already thirteen questions have been answered by its means. In order that these answers may be of more use than being merely minuted, a question book has been started, in which all these questions and their answers are fully detailed. This, your Committee hope, will be found of use to members. The very interesting and instructive displays given in this hall have combined both instruction with enjoyment, not only to the members, but to friends and visitors as well. To make these lantern displays more popular still, a resolution was passed at a late meeting to organize periodical lantern demonstrations for the instruction of members in manipulating the lantern and describing the slides. There has been one such meeting, and the result, so far, is very encouraging. It is expected that by this means you will have, ere long, a number of expert lanternists and qualified lecturers among our own members. Our relations with other societies of South Africa continue to be of a most friendly nature, and during the year we have judged competitions belonging to Kimberley, Capetown, and Cradock Societies. The Cradock Society have only started this year, but already have sent two parcels of prints to be judged, some of which are most creditable for so young a Society. The lantern-slide competition for the Society's silver medal, open only to members, closes on the 31st of this month, and your Committee hope that a large number of the members will compete in this. The idea of giving these medals for specific competitions such as this will, they sincerely trust, grow on the Society, so that other competitions of a like nature will be instituted during the incoming year, and will receive the warm support of the members. In conclusion, the Committee, in retiring from office, beg to thank the members for the assistance rendered them on all occasions, and to express the hope that the Society will continue to improve in the future as it has done in the past. It will devolve upon this meeting to elect the office-bearers for the ensuing year." The election of office-bearers for the year concluded the business, and we subjoin the names of the new Committee:—*President:* Mr. A. Walsh.—*Chairman:* Mr. W. Alcock.—*Vice-Chairman:* Mr. T. Stokes.—*Committee:* Messrs. Allen, Davis, West, and McIlwraith.—*Hon. Treasurer:* Mr. J. Lewis.—*Hon. Secretary:* Mr. W. A. Brown.

FORTHCOMING EXHIBITIONS.

1895.		
Sept. 23	.....	*Leeds. G. Birkett, City Art Gallery, Leeds.
,,	23–28	*Westbourne Park Institute.
,,	24	*Royal Cornwall Polytechnic Society. Edward Kitto, The Observatory, Falmouth.
,,	30–Nov. 2	*Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
,,	30–Nov. 14 ...	*Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
Oct.	28–Nov. 2	*Southport. G. Cross, 15, Cambridge-arcade, Southport.
Nov.	19–21	*Hackney. W. Fenton-Jones, 12, King Edward's-road, Hackney.
,,	28–30	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

A LIGHTNING PHOTOGRAPH.

To the EDITOR.

SIR,—I shall esteem it a great favour if you will give me your opinion of the accompanying photograph.

It is a very interesting specimen of lightning photography.

The view is of St. Peter's Church, Regent's-square, and was taken during the thunderstorm last Thursday night (August 22).

There has been no hand work whatever put upon either the print or the negative.

The short flashes of lightning at the right-hand side of the picture are rather curious; so, too, is the flash at the lower corner, which apparently was attracted by the light of the gas lamp, and so found its way to the earth.

Very interesting, too, is the light of the lamp itself.

The intense relief in which the trees stand out I thought rather striking, and the lighting altogether is strange; the minutest detail is rendered most distinctly, even the time on the clock tower is distinguishable (viz., 8.25), and, considering the difficulty of focussing, for, except for the intermittent flashes of lightning, it was absolutely dark, the detail is excellent, and, but for the heavy rain which was falling at the time of exposure, the picture would probably have been even clearer.

The exposure given was about four minutes, and proved in development to have been correct.

I judge it to be a distinct success in landscape photography by electric light, and shall be very glad to know what you think of it.

Thanking you in anticipation,—I am, yours, &c., O. E. OWENS.

Regent's-square, London, W.C., August 27, 1895.

P.S.—Will you kindly tell me how far hand work is justifiable on negatives of this class?—O. E. O.

[The photograph, of which our correspondent has given an accurate description, seems a remarkable specimen of its kind, and would do no great discredit to daylight work. As regards hand work on such negatives, we are of opinion that it is undesirable, for the reason that their scientific value is thereby impaired.—ED.]

GELATINO-CHLORIDE *VERSUS* COLLODIO-CHLORIDE.

To the EDITOR.

SIR,—Some few weeks since I was the innocent writer of a letter *re* the defects of collodio-chloride paper, which, though unnoticed at the time, has since called forth various remarks, to which I trust you will allow me to reply.

I claimed that collodio-chloride paper was expensive and difficult to use owing to the delicate nature of the collodion film, and I also said that collodion prints very quickly wore out when placed in an album, through the surface of the picture being rubbed away.

Mr. E. W. Foxlee, in the current number of *Autotype Notes*, rather scoffs at the position I take, saying that it is well known that collodio-chloride paper has the hardest surface of any. I agree that he is right in one respect, but it is as well known that some surfaces are hard yet very brittle, so that I consider my objection unanswered. I have a print in my possession which fully bears this out, and shall be happy to send it to Mr. Foxlee as proof "positive."

"Free Lance," writing *On Things in General* last week, says, on the subject of colodio-chloride paper, "One worker objects to its tender surface, and says the prints in an album will be injured by rubbing against one another. Did he ever see a couple of albumen prints that would not quickly spoil in an identical manner?" This I can fully answer, and say that I can produce collodio-chloride prints that have rubbed away more in twelve months than albumen prints would in as many years. The collodio-chloride surface is extremely thin, and the moment it chips away there is the white baryted surface showing underneath, while the albumen print may almost be said to be incorporated in the paper itself.

I prefer gelatine to collodion paper; but there are one or two points that have been overlooked in the discussion on gelatine paper, and one is the need to get it *fresh*, if the best results are to be aimed at. A pure white and crisp paper will give good prints; if it is yellow and limp, it may as well be thrown away.—I am, yours, &c., G. N. F.

"THE RED SEA."

To the EDITOR.

SIR,—In reading my JOURNAL of last week, I was very much interested in your correspondent's letter, entitled, "The Camera in the East." Having been over most part of the ground (and water) mentioned by him, I was pleased to read such an account of his travels; for, in doing so, it brought back to my mind some happy days. But there was one thing I could not swallow, viz., "I'm not sure you will believe my story, which is, that as we passed through the Red Sea our vessel had great difficulty in dodging the floating chariot wheels of Pharoah's hosts, which had been washed up from the bottom of the sea."

I should like to ask you, Sir, what you think of such a statement? Is the writer in real earnest in making such a statement? For my own part I should have been delighted to have seen such a sight when I went either up or down the Red Sea. I fancy I should have had a line overboard in no time, in the hope of securing such a trophy and relic.—I am, yours, &c., RED SEA.

August 26, 1895.

[The passage quoted from "The Camera in the East" was, of course, written *pour rire*.—ED.]

"DUST."

To the EDITOR.

SIR,—I am very sorry, but I have to contradict you again in your kind defence of the omnipotent manufacturer, in your answer to Mr. J. Robbins, in last number of THE BRITISH JOURNAL OF PHOTOGRAPHY. I had lately the same defect, and rather hard, too. I exposed three dozen films, of which I repacked two dozen same as they were originally, with paper between each two films, and one dozen I developed direct from holders, and the defect did show in almost all—and by almost I mean eight out of ten. The dust scheme won't work with my case, as the abrasions are in some cases one-eighth of an inch long and one-sixteenth of an inch wide, and irregular in thickness but straight in line. They look more like particles of some kind which dry with the film (gelatine), and cannot be dusted away, but are often removed only after fixing, when they can be seen and erased with the finger, leaving a perfectly transparent mark. Please try some other explanation than the dusting and repacking after exposure. Will some manufacturer please explain?—I am, yours, &c.,

Paris, August 24, 1895. A. LEVY.

P.S.—Are you aware that gelatine is hard enough to withstand such abrasions as can be seen in the complained-of films in such a clean way, and especially by *dust* particles, which don't fly around in such sizes?

PICTORIAL PHOTOGRAPHY: THE OLD AND THE NEW.

To the EDITOR.

SIR,—Will you kindly allow me to ask you and all the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY if you or they ever have heard of a remark more curious than one Mr. Maskell, F.S.A., puts in his speech—"Pictorial Photography: the Old and the New?" He says: "Again, one of the best photographic portraits I have ever seen owes a great deal to the movement of the sitter during a long exposure." Indeed, I should be really very much pleased to see this, by movement of the sitter, improved portrait. As far as I am aware, any unsharpness in a photograph produces a wrong drawing; and, just like unclean tones in music, establishes disharmony, and therefore can never be tolerated in any way.—I am, yours, &c., F. B.

THE TONING OF SOLIO PRINTS.

To the EDITOR.

SIR,—In THE BRITISH JOURNAL OF PHOTOGRAPHY we note that you have quoted an article from the August number of *Kodak News*, entitled, *Notes on the Toning of Solio with the Sulphocyanide Bath.* In the formula we give, a palpable error has crept in. It should read, "For use, pour A into B. Make up with water to one gallon." We are putting a note to this effect in the September number of *Kodak News*.—We are, yours, &c.,

THE EASTMAN PHOTOGRAPHIC MATERIALS CO., LTD.

115 *and* 117 *Oxford-street, London, W., August* 27, 1895.

THE LEEDS EXHIBITION.

To the EDITOR.

SIR,—I shall be glad if you will make known, through your columns, the following alteration in Condition 2 in the Prospectus of the Leeds Photographic and Process Exhibition:—

In considering various inquiries on the subject, the Committee has decided that the fact of the name of the Exhibitor appearing on the front of the picture or frame of the exhibit shall not disqualify such exhibit, though nothing in the nature of an advertisement will be permitted.

It was desired that the names of Exhibitors should be withheld from the Judges; but, as the condition as originally framed appeared to have a tendency to prevent pictures which had been already exhibited being sent in to the Leeds Exhibition, it has been thought best to rescind the condition, and arrange for the temporary covering up of the name prior to the judging.—I am yours, &c., GEO. BIRKETT, *Curator, N.B.*

THE HACKNEY EXHIBITION.

To the EDITOR.

SIR,—Will you please announce that, owing to the number of applications for exhibitors' forms for our next Exhibition, I have been unable to reply severally, but take this opportunity of saying that I hope to have the forms ready very shortly, and that, as soon as ready, they will be sent to all applicants.—I am, yours, &c.,

W. F. FENTON-JONES, *Hon. Sec.*

12, *King Edward's-road, Hackney, August* 23, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, half or whole-plate camera in exchange for a 12×10 landscape lens.—Address, L. PEARCE, 22, Grevelle-street, Bedminster, Bristol.

Will exchange a changing-box tent for any size up to whole-plate for a half-plate lens.—Address, R. PRINGLE, 121, Bucknall-road, Hanley.

Wanted, a whole or 8×10 plate wide-angle lens in exchange for a whole-plate rectilinear lens in good working order, used but little.—Address, J. SPAVIN, American Studio, Frodingham, Doncaster.

Will exchange pneumatic safety, diamond frame, ball bearings throughout, latest improvements, list price, 15*l.* 15s., for whole-plate studio camera with cabinet lens.—Address, WILLIAMS BROTHERS, Somerset House, Halton Road, Barry Dock.

Wanted to exchange Clement & Gilmer's nearly new half-plate and stereoscopic camera, three double slides, and tripod (without lens) for first-class quarter-plate hand and stand camera complete with lens, slides, &c.—Address, NICHOLLS, stationer, Twickenham.

No. 3 Junior Kodak (new); Rouch's Eureka hand-camera, lantern size; half-plate bellows camera, with Clement and Gilmer's euryscope, offered. Wanted, a quarter-plate copying camera, at least twenty-inches extension.—Address, TAYLOR, 2, Powis-place, Queen-square, W.C.

Set of model steam roundabout horses, new, will work two hours without any attention, very amusing for children. I will exchange for any one of the following:—Watkins's watch exposure meter, interior background, whole-plate double dark slide, or Thornton-Pickard instantaneous shutter (whole-plate).—Address, WM. HOLMES, 136, Derby-road, Heavor.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

H. WAKEFORD.—We are inquiring into the matter mentioned in your communication.

M. ELLIS.—Every dealer supplies light and rigid stands suitable for quarter-plate cameras.

J. THRUPP.—The photograph referred to was taken with a 20-inch reflector. The exposure given was 3½ hours.

B. T.—See the JOURNAL for March 1 and May 3, in which you will find several formulæ for ammonium carbonate in the developer.

G. MELVILLE.—No public announcement of the case you refer to came before us, otherwise we might have adopted your suggestion.

E. BROWN.—You can certainly prevent any one from using such a preparation as you describe, provided you patent it and it is novel.

WALTER.—Ordinary filtering paper is supplied by all dealers in photographic and chemical materials. Messrs. Marion & Co. supply a bibulous paper that is particularly free from "fluff."

TUDOR.—If permanence is the main consideration, by all means tone and fix separately. The opinions of chemists and those supposed to be able to judge have been pretty freely expressed of late with regard to the so-called "combined bath."

TANAIS.—The case is essentially one for the County Court, and we are inclined to think that the Judge would hardly agree with you as to the three prints being "not at all like you." The print we have marked No. 1 is, in our opinion, a fairly good one.

T. SOMERS.—The design of the studio is very good, except that it is much too low for general work, for standing figures, or groups especially. It it be made at least three feet higher, keeping otherwise to the same proportions, an excellent studio will be obtained.

CHARLES H. DANCEY (Gloucester).—The productions you refer to are, in our opinion, of a highly artistic and attractive nature, and we should think you would have no difficulty in making the agency remunerative. Beyond this we are scarcely in a position to advise.

R. H. BLEASDALE.—You cannot do better than have either a "ridge roof" or a "lean-to" studio. For the length given, eleven feet will be a suitable width. Five feet at either end should be opaque, both at top and sides. No work devoted to the subject is published.

J. RAWLINS.—"Will you kindly give in your next issue the address of the Anglo-American Varnish Company, mentioned in page 458 of your current volume as selling crystal varnish or white lacquer, and also state the price of it?"—The address is St. Paul's-square, Birmingham. We do not know the price.

"AUDACIOUS OPERATOR."—Assistant" asks if this correspondent, whose letter appears in the JOURNAL of August 16, will publish, *pro bono publico*, the formula of the toning bath he employs?

M. TWILLER.—1. *Evening*, an effective and skilful rendering of the subject. 2. *The Hills are Shadows*. The distance and lighter parts of the picture might, we think, have been shown with a little more force, and the subject perhaps have been better served by printing in platinum black. Both photographs, however, are good.

E. MOORE.—1. Some brands of gelatino-chloride paper are very prone to give pink tones. In your case, are you sure that light does not reach the prints while they are toning? 2. Castile soap applied dry. 3. This query, "With what do you mix lamp-black," is unintelligible, unless the purpose for which it is wanted is stated.

BONNY.—The case is one for the County Court. If the goods were not supplied of the kind ordered, and were returned at once, you will recover the amount paid when the order was sent. It is not such a question as a journal can interfere with, even where the circumstances are such as stated, and this we are somewhat inclined to doubt.

T. REYNOLDS.—French chalk would, no doubt, do very well as a lubricant, in burnishing prints, so far as mere lubrication is concerned; but, as the chalk would be forced into the print, much of its brilliancy would, we should expect, be destroyed. We have not, however, tried French chalk for the purpose. Why not do so yourself, and let us know the result?

E. MILLHOUSE.—If the sensitising bath worked well at first, and does not now, though of its original strength, it is pretty clear that it has become contaminated with something injurious. We should advise you to make up a fresh solution and see how you get on with that. The print enclosed seems to indicate that the paper is a little unevenly salted, to begin with.

COLLOTYPE says: "Can you inform me where I can obtain books of local views executed in collotype or suchlike process? I believe they are produced by an Austrian firm."—In reply: There is no need to go abroad for such views. You will best demonstrate your patriotism and study your pocket by writing for quotations to some of the firms of collotype printers who advertise in our columns week by week.

C. WILCOX.—Your letter is very sarcastic, but, because some fourth or fifth-rate photographers seem to expect efficient retouching, printing, &c., at the ridiculous price quoted, it must not be assumed the good class houses do the same. They, as a rule, pay good salaries for first-class hands, though perhaps not so much as used to be paid before the advent of gelatine plates. No good would come about from the insertion of your letter.

W. S.—Yes, the washings and fixings from gelatine papers are worth saving if you much work with these papers; but if you are an amateur, or a photographer in a very small way of business, the case may be different. It must be borne in mind that gelatine papers contain very little free silver, therefore there can be little to recover from the residues; also, that when the silver is recovered, it is not worth much more than half what it was some few years ago.

J. W. H.—The print is interesting, but there is nothing novel in it. It is a collotype, and in the ink has been introduced a lake, or, probably, one of the coal-tar colours, to give it the tone of a silver print. That colour, during the exposure to light that one half has been subjected to, has been discharged, hence the "fading." The print is, however, a photo-mechanical one, and is in ordinary fatty printing ink. Many of the "posters" to be seen on hoardings and railway stations behave the same. In many cases the colour of the inks change with a few days' exposure to the strong light.

TRUSTEE.—If the youth is not being taught the business in a proper manner, the law will give redress. Being kept for over two years, out of a term of three, at printing, mounting, and spotting, and not yet taught anything of studio work, is certainly not thoroughly teaching the business of a portrait photographer. We should advise you to consult the solicitor to whom you submitted the agreement before it was signed. He will very probably advise you to at once commence an action for the recovery of the money paid, and for damages for loss of time, which we should advise you to do, that is, of course, assuming the facts are as stated.

W. T. LUCAS.—The acetate of gold toning bath is for albumenised paper, and will yield the tones desired, provided the negative is sufficiently vigorous for the purpose and the paper adapted to give purple tones with such a negative. The prints should, of course, be well washed before they are put into the toning bath. In future, we should advise you to make up a larger quantity of toning bath than three ounces, containing a third of a grain of gold, at a time. We should also recommend you to get a cheap work on elementary photography. It will give you much information on printing and toning, which you, apparently, are deficient in.

CONTENTS.

	Page
THE ARRANGEMENT OF SUBJECT AND POINT OF SIGHT	545
PROCESS BLOCKS AND THE ILLUSTRATED PRESS	546
THE DECOMPOSITION OF GELATINE FILMS	546
DELEGATE'S REPORT OF THE SHREWSBURY CONVENTION. By J. S. TEAPE	548
A NOTE ON HYPOSULPHITE OF SODA. By EDWARD DUNMORE	549
PHOTO-MECHANICAL NOTES. By WILLIAM GAMBLE	549
A FEW ESSENTIALS TO SUCCESS IN PHOTOGRAPHY.—X. By T. N. ARMSTRONG	550
"AN IDEA IN PRINTING FRAMES." By J. PIKE	551
PHOTOGRAPHIC PRINTING BY MACHINERY	551
MERCUROGRAPHIC METHODS OF PHOTO-ENGRAVING. By THOMAS BOLAS, F.I.C., F.C.S.	553
THE USE OF SUPPLEMENTARY LENSES. By A. L. EIDEMILLER	553
THE BICHROMATE INFECTION. By J. F. SACHSE	553
A HOLIDAY IN MANXLAND. By W. FENTON-JONES	554
PHOTOGRAPHY OF THE RETINA	555
PHOTOGRAPHIC COPYRIGHT AND THE ILLUSTRATED PRESS	555
TESTS FOR SODIUM THIOSULPHATE. By MATTHEW WILSON	555
NEWS AND NOTES	556
RECENT PATENTS	557
MEETINGS OF SOCIETIES	557
FORTHCOMING EXHIBITIONS	558
CORRESPONDENCE	558
EXCHANGE COLUMN	559
ANSWERS TO CORRESPONDENTS	560

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1844. Vol. XLII.—SEPTEMBER 6, 1895.

BINARY PICTURES.

It has frequently been observed that when the world is ripe for the reception of a new idea, or for the germination of one that has been floating *in nubibus*, that idea suddenly germinates almost simultaneously in different places, rendering it a little difficult to affix the parentage upon any one individual. We leave to psychologists the onus of explanation, as this is more particularly in their line of thought. The nearly simultaneous discovery of the planet Neptune by astronomers of different nationalities will at once be suggested to the minds of readers as a noteworthy example of this idea; but we have at present in our mind's eye something of a very much inferior calibre, nay, ludicrously so in contrast with that just cited.

Photographic doubles! By whom were they really invented? It seems almost impossible to associate their inception with any person in particular. It is known, or, at any rate, has been stated that the idea was coëval with the Daguerreotype; but, if so, it appears to have lain dormant, until about thirty or thirty-one years ago it assumed a tangible shape and became developed all over the photographically civilised world. It remained for a little time, became one of the wonders of the period, was amenable to high development and puzzling examples, and gradually passed out of the ken of most. Although occasionally met with and, as we have found, still practised by some, the production of doubles may be relegated to the position of being nearly an unknown art, having fallen into a state of desuetude much as the production of stereoscopic photographs had well-nigh become previous to its *renaissance* of a few years ago.

A "double" or binary portrait may be described as a picture in which an individual appears in two different attitudes or characters, a once common example of this being a man seen playing chess with *himself*. The photographer who engages in this sort of work must possess considerable diversity of the inventive faculty, so as to compose his subjects in a variety of positions. What struck us at the time as forming the most diverse and attractive series of compositions we had seen, was some cases full of doubles which are being exhibited at the door and in the vestibule of the studio of Mr. Arthur Nicholls, of Sandown, these being both technically and artistically of a high order of merit. In one, a tailor in his shirt sleeves is engaged in taking the measure of a visitor (himself) for a suit of clothes. Another represents a little girl who has fallen asleep on a grassy lawn immediately underneath the window of a house by the wall of which she is being supported, not dreaming of the rude awakening to which she is just to be subjected, for, from a window above, she herself is seen projecting her head, and is about to throw a bucket of water upon the sleeper below. Or, again, a man in full Chinese costume is engaged in conversation with a plainly dressed Englishman, close examination revealing their identity. These and many other like subjects show the nature of the effects capable of being obtained by the binary photograph.

We now proceed to indicate the means by which these curious pictures are produced. It goes without saying that there being two independent exposures, one half of the plate must be shielded while the other half is being exposed. This is effected by various mechanical means, such as having in front of the plate two doors hinged at the sides and meeting in the centre, or by two sliding shutters drawing out at the sides and meeting in the centre. In taking a picture, say, of a lady playing on a pianoforte, with her duplicate standing at the end, the flap at one side is closed so as to show the performer only, and the exposure is made. The lens is then capped, and the lady, rising from her seat, takes her previously arranged position at the end, with her face expressing either admiration, severity, or horror at the performance to which she is listening. The previously opened flap is now closed and the closed one opened, special care being taken that no movement of the camera itself takes place. The lens is then uncapped, and the second position is thus secured. On developing, no line of junction of the two exposures can possibly be seen—that is, provided the two flaps have been properly adjusted. It is better that these flaps be not quite close to the plate, but placed about an inch in front of it. This causes a certain softening of the edges, by which the one line of junction is blended or vignetted into the corresponding line of the other.

During the year when this fad was on in full force, we had a camera altered so that the duplicating action was situated in the camera instead of being attached to the dark slide, as it originally was. This was attended with a marked advantage.

It is our belief that if those professional photographers who are experiencing bad times would introduce this system of binary portraiture, and do it really well both as regards technique and composition, it would tend to give a healthy impetus to business. This would be more particularly the case in towns or cities less favoured with a large population than the metropolis, and in which the recognition of the sitters would prove less difficult than in London.

Although any camera-maker would make the necessary fittings to enable these binary pictures to be made, the final adjusting of the flap or sliding shutters ought to be made by the photographer himself, for in this lies the success of a junction between the pictures that is incapable of being discovered; for if the edges of these shutters are too far apart, or not far enough, a line will be apparent in the centre. This ine may be too white or too black, but the correct distance will be easily ascertained on trial. In one we had fitted into a quarter-plate camera the shutters, which were made of thin zinc, were so far apart as to show a thin streak of light between when closed.

In looking over a collection of prints taken some years since, and in which were included some binaries, we came across a half-plate landscape print in which was a figure of a young lady repeated five times in different positions. This was not, however, made by means of the binary camera, but by the pantascopic camera of Johnson & Harrison. This kind of camera, now exceedingly scarce, travels slowly by clockwork over an angle of 120°, and it was only necessary for the subject, when once the exposing slot in the camera front had been seen to have passed her first position, to dart forward to a second position, previously marked, and await the passing of the camera to assume a third, fourth, and fifth position, in each of which she was depicted with perfect sharpness.

GOLD IN PHOTOGRAPHY.

Continuing our remarks of a fortnight ago, we desire to draw attention to a salt of gold used in the very early days of the science, as all old Daguerreotypers will remember—the then-called double hyposulphite of gold and soda. If any one desire to use a combined toning and fixing bath, there is much to be said in favour of resuscitating this old chemical. The one point of importance in making this solution is to have it uniform in constitution, and not liable to change. Now, the ordinary method of adding it to the "hypo" solution cannot possibly be expected to yield always the same result, so much depending on the closeness to neutrality the gold solution indicates, as also its state of concentration, and the strength of the hypo solution. That a reaction takes place is certain—what the products of that decomposition are is uncertain. By using this old double salt of gold, we know that we have simply a solution of hypo and a double thiosulphate of gold and soda. It may be urged that this salt itself may be liable to change, and bring about the very danger we are trying to escape. That difficulty is in theory only. As we write, there stands before us a sealed bottle of the double gold salt, made by "Fordor & Gelis," as far as we can estimate forty years ago; it is in perfectly white well-formed crystals at this moment. A fellow bottle, that has been used from, and often opened and exposed to the light, and not specially cared for, is almost as good—the faintest lilac tint is perceptible.

With regard to the use of gold solutions in combination with sulphocyanides, it will have been observed that, while some experimenters recommend that the gold solution be rendered neutral by chalk, some makers of printing-out papers say, "By no means do this." "When doctors disagree," &c., is forcibly borne upon the unbiassed student.

The text-books are not much use to us in this direction, if we wish to work from a theoretical standpoint; for, though they give us some interesting reactions, we can only assume that with the chemicals at the average photographer's command similar reactions occur to those which take place when neutral gold solution is added to a sulphocyanide. As gold sulphocyanide is not known in a separated form, and only the alkaline salts have been produced, it will perhaps be safe to infer that the double chlorides of gold and potassium or sodium will produce, when mixed with an alkaline sulphocyanide, the same salts. From this point of view it would seem that those who recommend a neutral gold solution on their side are, on account of the certainty of uniformity, more likely to be right. It is a fact that, in the early days of the use of collodio-chloride emulsions for printing, one of the most successful workers of the period recommended this neutralising of the gold by carbonate of calcium at a raised temperature.

As to the reactions that do take place when gold chloride (neutral) is mixed with, say, potassium sulphocyanide, they are as follow:—The aurous salt is stated to be produced when this neutral aqueous gold solution is added, drop by drop, at a temperature of 80° C., as long as the precipitate dissolves. This solution blackens in the light, and, if ammonia be added to it, the potassium is replaced by the ammonia.

The auric salt is produced when neutral aqueous gold solution is added to excess of sulphocyanide solution in the collodion. This salt crystallises from warm water in orange-red needles, which are soluble in either alcohol or ether. It seems probable that this is the salt produced, remaining in solution under the ordinary conditions of mixing the sulphocyanide toning bath for the modern papers. The thought naturally occurs that, if some manufacturer were to produce this double salt, and send it out in tubes like the ordinary chloride, an important step would be taken towards standardising a toning bath.

The exact conditions in which gold exists in the various toning baths of the day is by no means an agreed question; it is certainly not in a colloid state; hence our readers will be interested in a description of colloidal gold as produced by Herr Paul Schottländer. To a solution of 15·75 grammes of pure crystallised cerous oxalate in 300 c. c. of boiled water is gradually added, while shaking, 400 c. c. of decinormal soda solution, and then, at once, a 300 c. c. of a neutral gold solution, prepared according to Thomsen's method, and containing two grammes of gold. The mixture is first heated in the water bath, and then freely boiled for from an hour to an hour and a half. We read that this colloidal solution, which is a deep violet-red, and very permanent, is precipitated by basic acids and salts, with the formation of red or blackish violet deposits. It would be interesting to ascertain what would be the action upon prints, either before or after fixing and washing.

It is thus evident, from our brief survey of this interesting field of chemistry, that there is much yet to be learnt of the true condition of gold in the various toning solutions of the day, and, if, as we suggest, certain new definite salts of gold were to be placed on the market, there is every probability of success, technically and commercially.

MOUNTING PRINTS OF LARGE DIMENSIONS.

The mounting of prints, even of small size, is a branch of photographic routine in which a very large section of amateurs can scarcely be said to shine, not because the operation involves any serious amount of difficulty, but simply from the fact that a small modicum of care is necessary in order to attain the

best results. Daily observation serves to impress upon us more and more firmly the fact that large numbers of intelligent amateurs exist, who, while willing to devote every necessary attention to the production of the negative and of the print—to the purely chemical processes, in fact—entirely spoil the result of those labours by careless and slipshod treatment of the pictures in the final operation of mounting.

When the subjects are of large size, whether direct pictures or enlargements—and there are many amateurs who now venture on the latter branch of photography—matters become even worse; but here there is some little excuse for the operator who is not, by constant practice, an adept at the work, for, in addition to the care necessary with smaller prints, there is a certain amount of difficulty in handling large prints in the wet and limp condition with only a single pair of hands. Of course, constant practice in this, as in everything else, brings an amount of manipulatory skill that the comparatively unaccustomed hand can scarcely expect to acquire, and the fact remains that the mounting of large prints is frequently a severe strain upon the powers of the occasional worker.

Most of those who have essayed for the first time the manipulation of prints of no larger dimension than 12 × 10 or 15 × 12, must have been surprised to find that even in the developing and fixing baths, as well as in washing, a far greater amount of care is requisite in handling the papers than they would have supposed, and in sizes exceeding those mentioned it assumes the dimensions of an actual difficulty; but even this is as nothing compared with the troubles that surround mounting; yet with a little foresight and ingenuity every difficulty may be made to disappear, and the whole process become one of ease and certainty. Where the labour is divided and two pairs of hands are available in the process, matters are in a measure improved, though when a couple of operators engage in the task—as we have often seen—they require a certain amount of drilling to enable them to work in thorough harmony and without awkwardness, whereas the single-handed worker may proceed with perfect smoothness.

The great difficulty in the manipulation of large prints arises from the considerable expansion of the paper when wet and the consequent trouble this brings in getting the picture into its proper position on the mount. With small subjects, the print, after laying down on the card, can be shifted in position before rubbing it down by simply sliding it about; but this is practically impossible with the larger sizes, owing to the increased amount of drag of the increased surface; consequently, if the print be not laid down in the proper position at once, it has to be stripped off, and probably restarched, and so an endless amount of trouble is involved. Moreover, with small prints, the whole can be held comparatively flat by the outspread fingers of the two hands, and so its proper position accurately found before it is brought into contact with the mount; but this is not so with larger pictures, which have to be so handled that the greater portion of the surface is dexterously kept clear of the mount while one edge is placed in position, and it is here where the special skill that only comes from practice is necessary.

We have on more than one occasion advocated the practice, especially with gelatine prints, of laying the picture down on glass in order to apply the mountant, and, when large prints are in question, this plan becomes more particularly useful. Most such prints require trimming previous to mounting, and, if the operation be performed by means of a glass shape and a pair of long-bladed scissors, or, better still, one of the wheel trimmers, the mountant can be applied without removing the print from the trimming shape. The firm surface of the glass enables the mountant to be applied with great smoothness and uniformity, and its rigidity renders the handling of the print practically as easy on a large as on a small scale.

Now, having marked upon the mount by means of light pencil dots the correct position of two of the corners of the print—or, if preferred, a line may be drawn to indicate the upper edge—take the print as it lies on the glass and place the corners or the edge in the position marked, and gently lower the whole on to the mount. The print, being perfectly flat and evenly stretched on the glass, must of necessity fall into proper position over its whole surface, and the glass plate only requires gently but firmly rubbing down to bring it into intimate contact with the mount. If the latter be of rough or uneven texture, the contact may not be absolutely perfect over the whole surface; but this is of no consequence at this stage, as, if a fair amount of pressure be given, the picture will be sufficiently secured to the mount to prevent its position being altered, and perfect contact is easily obtained by a further rubbing down after the removal of the glass support.

When the print has been thus got into position, the removal of the glass is easily effected by slightly bending back the mount sufficiently to permit of the insertion of the blade of a knife, preferably an ivory paper knife, between the glass and the print at one corner; then, by working the knife gently along one edge until the whole of that side is separated, the mount, carrying with it the print, is easily stripped from the glass by merely bending it backwards. On no account should the stripping be attempted in the reverse manner, by lifting the glass from the print, or the result will, in all probability, be failure, and possibly damage to the print itself.

If carefully done, the stripping will cause little, if any, disturbance of the print in relation to the mount; but, if it should become detached at the edges, it is easily rubbed down again by any of the usual means, the function of the glass plate being simply to get it into proper position—the chief difficulty in ordinary mounting—the rest of the operation being carried out in the usual manner; and, if only adequate care and neatness be observed, the result will be perfect, and the time occupied even for very large prints far less than it has taken to describe the process.

There is no possible objection to be urged against this method, unless it be that some photographers are in the habit of trimming their prints to abnormal or unusual shapes and sizes, and this plan would for them involve the possession of a rather extensive set of shapes, or the making of a shape for each size of print. Of course, it is impossible to make things absolutely easy to those who are unable to select and compose their pictures in such a manner as to conform to something like standard shapes and sizes, and they must, we presume, work in the ordinary manner. But surely a choice of three or four different trimming shapes for, say, a 12 × 10 negative, should suffice to meet every requirement in the way of getting rid of objectionable foreground or suchlike; and the possessor of a cutting diamond or wheel glass-cutter can easily construct for himself out of waste negative glasses, at practically no cost, as many different shapes as he may feel disposed to work to. The glass, after cutting truly to shape, merely requires its edges smoothing by rubbing *gently* on a flagstone or other flat surface with a little fine sand or powdered emery; and, if not so finished-looking as the bevelled-edge shapes obtainable in commerce, it is at least cheaper and equally efficient.

A variation of this plan consists in substituting sheet celluloid for the glass plate, when, of course, it is even easier to provide shapes of abnormal pattern. The celluloid of the usual thickness employed for negatives is amply rigid for the purpose of facilitating the handling of the print; its transparency renders it equally convenient as a guide for cutting, and, preferably with the scissors, the print is as easily trimmed as with glass. Finally, the separation of the cutting shape after mounting is still more easily effected than in the case of glass, or, if preferred, it may be left in position until the print is dry.

This leads us to mention, in conclusion, another application of the process, namely, to the production of enamel or matt-surface prints. If the surface of the glass or celluloid—but for this purpose the latter is to be preferred—be prepared by waxing or polishing with talc, the mounting support may be left in position until the print is *quite* dry, when a slight bend of the mount will at once cause the print to spring away from the glass or celluloid with a surface either glossy or matt, as the case may be. For matt effects, of course, the glass or celluloid must be ground, and here celluloid affords a far more beautiful surface than glass. Whichever substance be used, if the surface be matt, it should first of all be waxed by rubbing a few drops of beeswax, dissolved in turpentine, over the surface, and polishing off the excess, and finally polished with powdered talc. If this be done, the print will come away with the most perfect dead-smooth surface it is possible to imagine, and without hitch or flaw.

The Weather.—What body of men are more interested in the weather than photographers, to whom any system of approximately correct meteorological prophecy would obviously be invaluable? But weather prophecies, it appears, are no more to be relied upon than the ornate promises of bubble company promoters. In another part of the JOURNAL we reprint a paper by Mr. R. Inwards, President of the Royal Meteorological Society, in which that gentleman, with unmerciful severity and sureness, exposes the fallacy and hollowness of attempting to prophesy what the weather is likely to be. It is an amusing and, in a way, instructive paper with a moral, which we hope all *soi-disant* weather prophets will forthwith take to heart.

Impure Hyposulphite of Soda.—The note in the last issue from Mr. Dunmore again calls attention to the fact that some samples of hyposulphite of soda are accountable for certain of the mysterious spots that sometimes make their appearance on prints, also that paying a good price for the salt does not always ensure having a good article, although it may be such in outward appearance. We were recently consulted with reference to some hyposulphite which produced spots on all the prints fixed with it, though for a long time the cause was not suspected. In appearance the salt was a very fine sample, and we afterwards learnt that it was of foreign manufacture. Hyposulphite of soda is obtained as a by-product, otherwise it could not be sold at the price it is, and any contamination it may contain is accidental and not wilful. How, then, is one to know which is a pernicious sample and which is not? Mr. Dunmore points out that on standing the solution of the pernicious salt deposits minute crystals, surrounded by a yellow stain. When a sample of the salt behaves in this manner, it should not be relied upon.

Another Successful Copyright Action.—Every case in which the illustrated press is successfully brought to book for infringement of copyright in photographs is interesting to the profession, as showing that, however unsatisfactory the present copyright law may be, it is sufficient to give redress, in most cases, when it is put into force. Last week the Autotype Company were successful in recovering substantial damages for the infringement of the copyright of their property in one of Mr. H. Ryland's pictures of which they publish photographic reproductions. An application was made by the plaintiffs, before Mr. Justice Mathew, sitting as vacation judge in the Chancery Division of the High Court of Justice, for an injunction to restrain the Periodical Publishing Corporation, Limited, Messrs. Wyman & Sons, Limited, and Mr. W. B. Young, as being respectively the proprietors, printers, and publisher of *Home Chat*, from printing or publishing a drawing called "Rosalba," but called in *Home Chat* "Elaine." The defendants submitted to a perpetual injunction, and an order for payment of fifty pounds as damages, cost of proceedings, and forfeiture of the process block to be destroyed, and also give the name of the one who made it. It was, we believe, understood that no proceedings would be taken against him. A noteworthy feature in this case is the expedition with which it was carried through, notwithstanding it is the long vacation. As soon as the Autotype Company noticed the piracy they put the matter in the hands of their solicitors, who promptly took action. The injunction, &c., was granted on the 27th ult., and the date of issue of the periodical containing the incriminated picture was the 24th, three days before. There certainly can be no complaint of the "law's delays" in this instance.

Bichromate Disease.—The injurious action of the alkaline bichromates on the skins of some persons has of late attracted attention both in Germany and in America; but, unfortunately, without anything new or of value being elicited on the subject, or any efficacious remedy being suggested. The description of the disease, as given in some of the foreign journals, is not, however, quite in unison with that expressed by those who have given attention to the subject in this country, one of whom is Dr. B. W. Richardson. In the cases which have come under our immediate notice, and they have been several, the disease has not extended beyond those portions of the body that have been in constant contact with the solutions—the hands and arms. It is generally considered, by those who have suffered from the malady, that a strong cold solution of the bichromate is less harmful than is a very dilute hot one; that there is less risk, for example, in sensitising the paper than there is in developing the image with hot water. Opinions are all agreed that the only cure for the disease is to prevent further contact with the salt, and nature will quickly work the cure. As an ameliorative of the intense itching of the affected parts, a lotion containing carbolic acid is again recommended. Many years ago we mentioned that a dilute solution of carbolic acid, in spirits of wine, and a little glycerine, was the best allayer of the virulent irritation that had been published. It was given in the *Asclepiad* ten or eleven years back. It is a singular fact that the bichromate has no effect on some persons, while others may suffer after only a few weeks' employment of it. We have in our mind just now two gentlemen who have worked with the bichromate for several hours daily, for more than twenty years, and they have never suffered the slightest inconvenience therefrom. We may add, for the information of those who only use the bichromate occasionally, or in an amateur way, that we have never heard of an authenticated case where ill effects were experienced until after several weeks' constant use of the salt.

SOME REMARKS ON PLATINOTYPE PRINTING.

[Autotype Notes.]

THE importance of method cannot possibly be over-estimated, and in no photographic operation is it more needed than in printing. Without system, the extensive labours of the professional printer would cease to be profitable, and the amateur therefore may, with distinct gain to himself, copy some of his methods of procedure. Now it has to be remembered that platinum printing is considerably quicker than ordinary silver printing, and that the time therefore consumed in examining one of a batch of printing frames would be sufficient to spoil all the rest of the prints, unless, perchance, he had taken the precaution to turn all the rest of the frames face downwards whilst he made the examination of the first frame.

In large printing establishments the negatives are arranged in batches according to their density, and the thinnest one of each batch is selected for first examination.

Let us briefly examine the working of this method. To start with, let us suppose that fifty negatives are in the hands of the printer, and that these are arranged in batches of ten. The first batch would naturally be the quickest printing negatives, and the last batch the very slowest. Even in the thinnest batch a close examination generally enables one to detect slight differences in density; select, therefore, the negatives in the order of their density before putting them in the frames. A little patient care in this operation will tell in the end. Keep the frames in the order of their selection, and put them out in batches of ten. No. 1 of this batch will be the thinnest. Of course examine this one first, and if there is reason to think it is sufficiently printed, turn face downwards all the other frames of this batch. By this time batch No. 2 may be examined, of course looking at the thinnest one of the batch first. Continue this order of observation through the whole series of negatives. If this sounds to the reader somewhat rigmarolish, it has to be remembered that in practice, when once the classification has been made, the operation of examining is quickly performed, for the experienced printer just peeps at the print in the shade, and from this hasty examination determines the condition of all the rest of the series.

From what has been written above, the amateur will readily see that though he will never have occasion to put out such a large number of negatives, this systematic method of work will help him immensely in securing uniformity in the quality of his prints.

As the platinum paper is so much more sensitive than ordinary silver paper, the rough-and-ready method of examination in the open air is scarcely available; it is better, therefore, to turn down all the frames of even a small batch whilst the examination of No. 1 is made. As the impression is very faint, more judgment is needed to determine when the negative is fully printed; be deliberate therefore in arriving at a conclusion, and look well at the more delicate parts of the negative. Of course, be very particular to employ only as much feeble white light as is necessary in order to arrive at a correct judgment as to the proper timing of the printing operation. The sensitometer is a great aid to the beginner, but after a time becomes quite unnecessary. Even in carbon printing, where the print cannot be examined at all, the experienced printer only needs his useful instrument when printing very dense or very difficult printing negatives.

The amateur must not forget that the action of light once set up is continued in the dark, and that this applies equally to platinum as well as to carbon. If he has any doubt of this, let him print until the shadows are well out, but the half-tones wanting, and then put away the frame, with the paper still in contact with the negative, in a dark place for half a day. When he removes the print from the frame, he will probably find that all the details are fully out, and there is quite a strong image. On immersion in the developing solution, particularly if this is of the normal strength, the print will rapidly develop into a muddy over-printed one. It is necessary, therefore, to remove the print from the negative, and store it *in a perfectly dry place* until the other prints are taken from the frames, and then proceed to development. Remember, the slightest damp aids immensely in bringing about this after-development in the dark. The most marked results seem to be produced when the print is left in contact with the negative. It seems as though the light is still stored in the negative, or at least sufficient of it to continue the chemical action in the dark.

Amateurs very rarely varnish their negatives. No professional would omit this important operation, for he knows too well the value of a good negative to run the risk of damage. The waterproof indiarubber pads recommended for platinum printing contain a large proportion of sulphur on their surface. If these pads, therefore, are left in contact with the unvarnished negative film, the sulphur attacks the silver surface, and black spots are the result. I have recently tried the glazed American cloth used for table covers with good effect. It is sufficiently waterproof to keep out damp, and there is no danger of spotting unvarnished negatives. One precaution is necessary when varnished negatives are employed. The surface should be well rubbed with French chalk or Fuller's earth, otherwise there is a danger of the adhesion of the two glazed surfaces. At any rate, a sufficient attachment to slightly damage the varnished surface of the negative might result without this precaution.

If paper be kept for some time flat and under pressure, but without any further precaution against damp, there is a loss of brilliancy in the print, and the tone is not nearly so cold. This fact can be turned to account in printing hard negatives. It must not be forgotten, however, that the paper cannot be kept in a very damp place without serious deterioration.

It is most important to remember that the platinum is very much on the surface of the paper, and therefore take care not to drag the prints over each other during washing operations. Many prints are spoiled by inattention or want of knowledge in this matter. Like the plum, the bloom is easily destroyed by any roughness in the handling. If there is reason to believe the print is over-printed, weaken the developer very considerably and watch the result. By this precaution the print will probably be saved.

In the practice of any new process, follow the directions with great exactness. The platinum process is no exception to this rule.

VALENTINE BLANCHARD.

PHOTO-CHEMICAL NOTES.

The Use of Formalin in Photography.

As a substance of service to the photographer, formic aldehyde is likely to attract further notice. It has already been shown what a powerful tanning action it exerts upon gelatine, and a printing process has now been devised and patented by the *Chemische Fabrik auf Actien*, of Berlin, in which this property of formic aldehyde is utilised, in conjunction with another well-known property, and one common to all the aldehydes, viz., that of readily taking up oxygen from any substance capable of employing it, such substances, for instance, as ferric salts. The process consists in treating gelatine films, which have been rendered insoluble by means of formic aldehyde, with a solution of a ferric salt. On exposure to light under a negative, the ferric salt is reduced to the ferrous state, and the oxygen disengaged in the process is transferred to the formic aldehyde, converting it into formic acid, with the result that, where this oxidation of the aldehyde has taken place, the gelatine film is rendered soluble again. By this means, therefore, a positive image is obtained from a positive on development by washing.

A modification of the process is also patented, whereby a positive print may be obtained from a negative. To this end, the formic aldehyde is first converted into its so-called "sulphite," a compound which does not render gelatine insoluble. A gelatine film previously treated with this sulphite, and impregnated also with a ferric salt, is exposed to light, the result being that, in the parts where light is transmitted, the sulphite is oxidised through the agency of the reduction of the ferric salt, and the formic aldehyde is thus liberated, with the subsequent production of insoluble gelatine in these same portions.

Action of Light on Lead Bromide.

Some recent experiments by R. S. North (*American Chemical Journal*, vol. xvii. No. 3) on the action of light on lead bromide, seem to throw a little light on the action of light on the corresponding silver haloid. The sensitiveness of the lead haloid to light was found to be much less than that of the silver compounds. The author obtained the maximum action by rubbing a little of the powdered bromide between two glass plates, so that it formed a layer sufficiently thin as to allow of print being read through it. After exposing this film to light for several days a black product was obtained which was found to be soluble in water acidulated with nitric acid, leaving a small residue of metallic lead, equal to about one per cent. of the powder. Analysis of the black product, passed into solution, showed that the compound had lost about three per cent. of bromine. These facts seem to point to the action being one of simple dissociation of the lead haloid. In another experiment, lasting several weeks, a product lighter in colour was obtained. It dissolved, without residue, in water acidulated with nitric acid. The author considers that the metallic lead was oxidised by further exposure. At any rate, the phenomenon seems to bear some resemblance to that of the reversal of the image. The darkening of the lead salt was found to take place in both dry oxygen and hydrogen gases and also, rather more slowly, under water. The action also took place in the case of the fused bromide.

The Detection of Sulphurous in presence of Thiosulphuric Acid.

Many of the substitutes for sodium thiosulphate sold as "fixing salts" consist of this substance in admixture with an alkaline sulphite or metabisulphite. The detection of one in presence of the other offers some difficulties, and the subject is dealt with in a note by Mr. R. Grieg Smith in a recent issue of the *Chemical News*.

The presence of thiosulphate may generally be easily recognised by the fact of its decomposition with separation of sulphur when treated with an acid. Should a thiosulphite be found to be present, a dilute solution of the substance should be prepared, and a solution of barium chloride and of ammonium chlor de added to it. By so doing, the barium salts of sulphuric, sulphurous, and thiosulphuric acid are precipitated. Hydrochloric acid is then added, drop by drop, whereby the barium salts of sulphurous and thiosulphuric acid pass into solution. A white precipitate, undissolved by hydrochloric acid, indicates the presence of a sulphate in the mixture. The precipitate is filtered off. The filtrate should not exhibit any turbidity due to separated sulphur. Should it do so, the liquid has not been sufficiently diluted in the first instance, and the only thing to do is to start again, employing a greater dilution. Divide the clear filtrate into two parts; to one add iodine solution until the liquid is yellow. The production of a white precipitate of barium sulphate indicates that the original substance contained a sulphite which, being converted into a sulphate by the iodine solution, has been precipitated as sulphate of barium by the barium chloride present. Filter off this second precipitate, and add bromine water to the filtrate. A similar white precipitate here indicates that the substance under examination contained a thiosulphate. The action of iodine upon this substance was to convert it into a tetrathionate, which, by the action of bromine, was converted into a sulphate, and was consequently precipitated by barium chloride. This method of detecting the three acids in presence of one another, is inapplicable if the mixture contains hydrogen sulphide. The latter must be removed by passing a current of carbon dioxide through the liquid. G. E. Brown, A.I.C.

WEATHER FALLACIES.

[An address delivered to the Royal Meteorological Society, by Mr. Richard Inwards, President. Reprinted from the *Quarterly Journal* of the Society.]

In the long and patient pursuit which the attainment of all accurate knowledge exacts from man, it may sometimes be instructive to turn one's gaze backward and contemplate the errors which have been corrected, the fallacies which have been demolished, and the superstitions which have been lived down; and this consideration has prompted me to take for the subject of this year's address that wide range of human opinions which may fitly be classed under the head of "Weather Fallacies."

Nothing could have been more in accordance with the law of growth in other branches of knowledge than that meteorology should, in its earliest dawn, have been with difficulty able to emerge from the mists and darkness of guesses and surmises such as have surrounded the transfer of any truth from the barbaric to the philosophic stage.

It is to the Greeks that we must look for the first real weather observations after the matter had passed through what may be called the mere savage phase; and we find Hesiod, Theophrastus, and Aratus presenting us with an early code of rules, which serve at least to show us how little we have ourselves advanced in some matters since their time.

One of our Fellows, Mr. J. G. Wood, has just given to the world an excellent and scholarly translation of the work of Theophrastus, which has not previously been put in an English garb, and Mr. Wood has done the whole country a great service in giving us this translation of the *Winds and Weather Signs*, a book which contains a host of rules and observations about the weather, and which, as might have been expected from the production of the favourite pupil of Plato and Aristotle, is singularly free from errors of the grosser and more superstitious kind, such as were plentifully produced in Western Europe many centuries later.

But long before the time of Theophrastus, and probably very soon after the invention of agriculture itself, there were weather gods and weather fallacies; for we find that Jupiter Tonans and Pluvius—the thunderer and the rain-maker—were set by men on the highest pedestals. And centuries after this, Lucian tells us that it was usual in his time to offer prayers for suitable weather, and he recounts in his *Dialogues* how two countrymen were at the same time offering up contrary petitions—one that not a drop of rain might fall until he had completed his harvest, while the other prayed for immediate rain, in order to bring on his backward crop of cabbages—both suppliants only too sure to find that the ears of the image were deaf as the stone of which they were made, and that the wheels of the universe would not wander or turn back for any selfish ends of man.

In considering these early times (when the weather had to be studied from cloud, sky, and sea, and from the behaviour of the animals and plants, we must be ready to excuse men for doing that which is still too frequently a cause of error, viz., foretelling what they most wished for, and putting down as universal law that which was only a coincidence of totally independent events. In considering weather fallacies, it will be impossible to follow a chronological order, so I shall treat them, or, rather, a small portion of them, under the heads of saints'-day fallacies, sun and moon fallacies, and those concerning animals and plants; while finally I shall consider the almanack makers, weather prophets, and impostors who have, from time to time, furnished the world with materials for its credulity or its ridicule.

The first class of weather fallacies, which I shall scarcely more than mention, are those which refer to the supposed connexion between the weather of any day in the week or year, and that of any of any other period, and it may be as well to state at the outset that there is no kind of foundation in fact for any of these so-called rules. They are, for the most part, born of the wish to see certain kinds of weather at certain times of year, and, like all these predictions, were faithfully remembered when they came true, and promptly forgotten when they failed. One has often heard—

"Fine on Friday, fine on Sunday."

Or that "Friday is the best and worst day of the week," and the superstition even extends to hours of the day, for we have—

"Rain at seven, fine at eleven."

which is only another way of saying that rain does not usually last four hours, and the rule generally fails when applied to daily experience; but the host of proverbs connected with saints' day are more difficult to deal with, on account of the longer time which elapses between the prophecy and its fulfilment or failure. All, or most, of these proverbs concern the days of certain saints, though I think no one imagines that this is anything more than a convenient method of fixing the date, because our ancestors had a saint for every day, so that they naturally referred to the day by his name.

There are forty weather saints, among the most prominent of whom is undoubtedly St. Swithin, whose day is July 15, and the superstition is that if it should rain on that day it will rain for forty days after. Now, as Mr. Scott observes, this date is very near a well-known bad time in wet years, as the terms, long in use, of "St. Margaret's flood" and "Lammas flood" abundantly testify. The fact that some of these heavy rains began on July 15 has been enough material for the adage-monger, and so we have another "universal" law laid down, a law which is, however, constantly broken, as every student of the weather very well knows. The whole thing is a fallacy of the most vulgar kind, and ought speedily to be forgotten, together with all the adages which make the weather of any period depend on that of a distant day.

Turning in weariness from this class of superstitions, which may be said to belong to the self-exploding order, we are next met by an extensive array of authorities who, under the protecting shield of astronomy, profess to have framed infallible rules for the weather as judged from the ever-varying relative positions of the sun, moon, and planets. They attack us systematically and persistently, appealing to analogy, to reason, and to common sense. But it is sometimes necessary to be on our guard, even against common sense, in considering problems to which uncommon sense has for centuries been devoted without avail. The well-known action of the sun and moon upon the ocean tides is generally the starting point of these theorists, and it is soon shown to common sense that when the earth is nearer the sun, or the moon is nearer to the earth (it being remembered that they move in elliptic orbits), or when both sun and moon are, as it were, pulling together, as at new moon, there ought to be a tide of atmosphere caused by their influence similar to the tides of the ocean, which such agencies undoubtedly produce. But we find that, whatever so-called reason, analogy, and common sense may seem to dictate, the facts will not follow in the paths marked out for them; and the atmospheric tides refuse to ebb and flow, except in a most infinitesimal degree, quite disproportioned to their supposed moving forces. The theorists must try again, and they do so by pointing out that the moon and earth move in planes which are inclined to each other at an angle, and that at some times of the year the attraction of the sun and moon are acting in somewhat widely diverging lines, whilst at others they are pulling more nearly in the same plane. Here is, they say, a clear case. At times, when the angle is greatest, there should at any rate be worse weather caused by the conflicting forces. When the moon is said to be "on her back," or, in other words, when the line of the shadow boundary of the half-moon or crescent is much inclined to the earth's axis, then is the time, say they, for tempests and commotions to come. But, again, the spirits from the "vasty deep" do *not* come when called, and we have to invent other causes for our earthly disturbances.

It may be safely said that a new moon theory as to the weather comes out at least once a year, and it has been attempted to connect the honoured name of Sir William Herschel, with a table which professed to show the dependence of weather changes on those of the moon.

By the kindness of Mr. Symons, I am able to show you on the screen a much-magnified representation of this production, now very scarce, and which has the name of Herschel in large capitals, no doubt as a sort of ballast to give it weight and steadiness, though it does not definitely state that Herschel had anything to do with it. Herschel's own letter on the subject runs as follows:—

"Sir,—I am glad of an opportunity to say that prognostications of the weather are so much above the knowledge of astronomers that I have taken

incommon pains publicly to contradict reports of predictions that have been scribed to me. You may therefore be assured that what you have heard as ny opinion about the frost is without the smallest foundation. If at any ime Slough should be in your road, I shall be very glad to see you here, and remain, Sir, Your most obedient servant,

"*Slough, near Windsor, February* 6, 1814. WILLIAM HERSCHEL."

So that any Fellow of this Society who sees one of these diagrams in the future will know that it is a fraud.

Of course, it is in the power of every one to check the predictions which are so often issued with respect to the changes of the weather taking place at the change of the moon; but many eminent men have occupied themselves with the subject, and the result is that no correspondence between the two classes of phenomena has been established.

Dr. Horsley examined the weather tables of 1774, as published by the Royal Society, and out of forty-six changes of weather in that year, only ten occurred on the days of lunar influence, only two of them being at the new moon, and none at all at the full. M. Flarguergues, of Viviers, found also as the result of twenty years' observations, that the barometer readings taken when the moon was furthest from the earth, averaged 755 millimetres, and when nearest, 754 millimetres, showing a difference of one millimetre, or about ·04 inch, and this in a direction against the theory, the pressure being greater by that amount when the moon was farthest from the earth.

Various other weather seers have pinned their faith on lunar cycles, and have predicted that weather changes would repeat themselves as soon as the sun and moon got back into the same relative positions, which they do in nineteen years, with only an error of an hour and a half. Others, such as Mr. G. Mackenzie, advocated a cycle of fifty-four years, but it may be summarily stated that all the cycles have broken down, and that, as far as we know, there is no definite period after which the weather changes repeat themselves.

Other fallacies about the moon are numerous, such as that the full moon clears away the clouds; that you should only sow beans or cut down trees in the wane of the moon; that it is a bad sign if she changes on a Saturday or Sunday; that two full moons in a month will cause a flood; that to see the old moon in the arms of the new brings on rain; and many others, of which a catalogue alone would take up a good deal of space. M. Flammarion says that "the moon's influence on the weather is negligible. The heat reaching us from the moon would only affect our temperature by twelve millionths of a degree; and the atmospheric tides caused by the moon would only affect the barometic pressure a few hundredths of an inch—a quantity far less than the changes which are always taking place from other causes." On the whole, we are disposed to agree with the rhyme which thus sums up the subject:

"The moon and the weather
May change together;
But change of the moon
Does not change the weather."

Even the halo round the moon has been discredited, for Mr. Lowe found that it was as often followed by fine weather as by rain, and Messrs. Marriott and Abercromby found that the lunar halo immediately preceded rain in thirty-four cases out of sixty-one. We always have a lingering hope that some future meteorologist will disentangle the overlapping influences, and arrive some day at a definite proof that our satellite after all has something to do with our weather.

About the sun, also, there are many fallacies, and ever since the discovery that the spots which appear on his surface have a period of greatest and less frequency, there have been theorists in shoals who have sought to prove that this fact rules our weather. It has undoubtedly been found that the frequency of sun spots and the variations of the magnetic needle are intimately connected; and it is almost equally well established that the aurora appears and disappears in some sort of sympathy with the sun-spot variations. But this, up to the present, is as far as we can get in this direction, for our weather seems to have no definite relation to these changes.

The more recent discoveries of prominences visible round the disc of the sun during an eclipse, and of the light clouds only seen in M. Deslandres' spectro-photographs, will, no doubt, call out new weather theories on the subject; and I must confess to a wish that those mysterious flame like bodies rushing from the sun millions of miles into space will be found to have some influence on the upper layers of our earth's atmosphere; but I also hope that we may be saved from a theory on the subject until more facts are before us.

Coming down to earth again, we are met by a long array of fallacies connected with the behaviour of animals and plants, and which have a supposed connexion with weather changes. Few of these are so well grounded that they may be considered as proved, and, as nothing is sacred to a meteorologist, our veteran Fellow, Mr. E. J. Lowe, F.R.S., has endeavoured to put some of the rules from this source to the test of definite observation. He took a number of well-known signs said to indicate change, and carefully noted what happened after each sign, and, although he does not say that all indications from animals, birds, and plants are useless, yet certainly those he did investigate seemed utterly to break down.

He took the well-known signs of bats flying about in the evening, many toads appearing at sunset, many snails about, fish rising much in lake, bees busy, many locusts, cattle restless, landrails clamorous, flies and gnats troublesome, many insects, crows congregating and clamorous, spider-webs thickly woven on the grass, spiders hanging on their webs in the evening, and ducks and geese making more than usual noise. Mr. Lowe found that, in 361 observations of the above signs, they were followed 213 times by fine, and only 148 times by wet weather; so that, even after the pronostications for rain, there was a greater preponderance of fine weather. He called a day fine when no rain was measurable in the rain gauge. Mr. Lowe says that even swallows flying low cannot be depended on, as, especially at the close of summer and autumn, they almost invariably skim the surface of the ground, and Mr. Charles Waterton, the naturalist, decided, after careful observation, that the unusual clamour of rooks forms no trustworthy sign of rain. These must, therefore, swell the list of fallacies, although there are many other rules which have not been so carefully examined, but which may still be true. My own impression is that, although it is painful to dismiss the animals from their ancient position as weather prophets, we may consider them as indicating what they feel, rather than as predicting what is to come, and that their actions before rain simply rise from the dampness, darkness, or chilliness preceding wet weather, and which renders these creatures uneasy, but not more so than they affect man himself. The sheep turning its back to the wind (one of the best-known signs of rain) is probably only that it may shelter its least protected part from the effects of the weather; and many of you must have observed sheep sheltering their heads from the heat by getting them into the shade of each other's bodies in a similar way.

As to cows scratching their ears, and goats uttering cries, and many other signs of bad weather, they are at least very doubtful; whilst the adage about the pig which credits him with seeing the wind carries with it its own condemnation.

The medicinal leech is still left on the list of weather prophets, though he has no doubt had his powers exaggerated, and two books have been written about his behaviour during changes of weather. One is by Mrs. Woollams, who, during a long illness, watched a leech in a bottle, and carefully noted what it did; and the other is by a gentleman at Whitby, who came to the conclusion that leeches could be made to give audible and useful storm warnings. So he contrived the instrument, of which I now show you a drawing taken from his book. No one would imagine from its appearance what its use could be. It consisted of twelve glass bottles, each containing a leech in water, and so arranged in a circle, in order, as the humane inventor states, that the leeches may see each other and not endure the affliction of quite solitary confinement—this rather reminds us of Isaac Walton, who told his pupil to put the hook into the worm "tenderly, as if he loved it." In each bottle was a metal tube of a particular form, and which was made somewhat difficult for a leech to enter, but into which it would endeavour somehow to creep before a thunderstorm, according to its nature. In each tube was a small piece of whalebone, to which a gilt chain was attached, and so arranged, on the mouse-trap principle, that when the whalebone was moved the bell at the top of the apparatus was rung by means of the chain. There were twelve leeches, so that every chance was given that one at least would sound a storm signal. The author called this apparatus the "Tempest Prognosticator," a name which he preferred—and I think we shall agree with him—to that of atmospheric electric telegraph conducted by animal instinct. He went on to state in his little book that he could, if required, make a small leech ring the great bell of St. Paul in London as a signal of an approaching storm. The book is written in all seriousness, and a number of letters are appended from gentlemen who certify that correct atmospheric indications were at various times given by the leeches. The name of the inventor of this ingenious contrivance was Dr. Merryweather—himself a learned leech.

Plants have also their advocates as weather indicators, and there is no doubt that in most cases they act in sympathy with changes in the dampness, gloominess, or chilliness of the air, and as these conditions generally precede rain, one cannot term the indications altogether fallacious. The pimpernel and the marigold close their petals before rain, because the air is getting damper, while the poplar and maple show the undersurface of their leaves for a similar reason. Indeed, an artificial leaf of paper may be made to do the same thing, if constructed on the same principle as the natural one—a hard thin paper to represent the upper side of the leaf, and a thicker unsized paper for the lower side; these will, if stuck together, curl up or bend down in sympathy with the hygroscopic condition of the air. A slip of ordinary photographic paper will do the same, and will curl up at once when placed on the hand.

The same slackness which moisture produces in plants applies in some degree also to insects, some of which can only fly in sunshine, so that there is a chain of weather signs all following from a little dampness in the air. The flowers close their petals and shut in their honey, the insects cannot fly so high, and the swallows seeking them skim the surface of the earth, and even then the threatened shower may not come.

In 1892 attention was directed to a plant, the *Abrus precatorius*, a beautiful shrub of the mimosa kind, which has the property of being sensitive in a high degree, so that its pinnate leaflets go through many curious movements, and it was claimed that these form a guide of unerring certainty to foreshow the coming weather. Even earthquakes

were said to be predicted by this wonderful plant. If it closed its leaflets upward, after the manner of a butterfly about to settle, fair weather was shown; when the leaflets remained flat, changeable and gloomy weather was indicated; while thunder at various distances was to be foretold by the curling of the leaflets, and the nearer the thunder the greater the curl, until when the points of the leaflets crossed, the thunderstorm was indicated as being overhead. Changes of wind, hurricanes, and other phenomena were to be shown by the various curious and beautiful movements of the leaflets and stalks. These movements undoubtedly took place, but when the plant was submitted to the unprejudiced observation of Dr. F. W. Oliver and Mr. F. E. Weiss, at Kew Gardens, those gentlemen failed to find any connexion between these movements and the weather, and Dr. Oliver made a report on the matter, which hits the heart of the whole subject of plant movements, by ascribing them for the most part to the agency of light and moisture. Mr. Scott, of the Meteorological Office, gave the finishing stroke to the theory by proving that the movements had no connexion with either cyclones or with earthquakes, so that the sensitive plant may be considered as out of the list of weather guides, in spite of having been made the subject of an English patent.

It is a most common observation in the country that a large crop of hips, haws, and holly-berries indicates a severe winter to follow, and it is generally pointed out that nature thus provides winter food for the birds. This, too, is a fallacy.

Another weather fallacy, for which artists are responsible, is that flashes of lightning take the form of long angular lines of a zigzag shape, and of which I show you an example, taken from a work on the subject. This, when compared with the next view, which is a photograph taken direct from nature, shows that the artist had very little understood the true form of the lightning flash, which consists of numbers of short curves joining each other, something like the course of a river depicted on a map, or in some degree like the outline of a clump of leafy trees seen against the sky. But, as far as I know, there were only two artists whose acute vision saw lightning in anything like its true form. One was Turner, who long before the time of photography scratched his lightning flashes with a penknife, making short curved dashes across the picture; and the other was Nasmyth, the astronomer and engineer, who also saw the lightning in its true form, and duly noted the same, only to be confirmed years afterwards, when it became easy to photograph the lightning flash itself. While on the subject of lightning, I may mention that it is recorded that in one case at least a rheumatic man who had been confined to bed six weeks, received a shock from a stroke of lightning, jumped from his bed, and ran down stairs completely cured. This is related in the *Gentleman's Magazine* for June, 1820.

It has been often stated that the noise of cannon will produce rain, and it is not unusual in the Austrian Tyrol to hear the church bells ringing to avert thunder. These are fallacies. The experiments in America, made recently to test whether rain could be produced by exploding a large quantity of gunpowder in the air, resulted in nothing except noise and smoke, though the thing was well worth trying.

Empedocles of old is credited with the invention for chasing away the Etesian winds by placing bottles made of the skins of asses on the hills to receive them. Timæus relates this. After hearing this about Empedocles, one is not surprised to learn that he thought there were two suns, that the moon was shaped like a dish, and that the sea was the sweat of the earth burnt by the sun. All this will be found in Stanley's *Lives of the Philosophers*.

Almost in our own time, too, a "pluvifuge," or machine for blowing away rain, was proposed in Paris. This, too, was a fallacy.

To give an account of all the various ceremonies in savage and civilised countries which have been resorted to for the purpose of changing the course of the weather would be here impossible; but such rites have a common origin and a common result. They begin in error and end in failure. In India, the rain god is imagined to pour down showers through a sieve; in Peru there was supposed to be a celestial princess, who held a vase of rain, and, when her brother struck the pitcher, men heard the shocks in thunder. In Polynesia rain comes from the angry stars stoning the sun; while in Burmah it is still the custom to haul down rain by pulling at a rope. New Caledonia has its regular rain-making class of priests, and in Moffatt's time the rain-makers of South Africa were held in even higher estimation than the kings; and on the other side of the world the Alaskan propitiates the spirit of the storm by leaving tobacco for him in a cave. In our own country, too, there have been weather witches of various grades, and one described in Drayton's "Moon Calf"

> "Could sell winds to any one that would
> Buy them for money, forcing them to hold
> What time she listed, tie them in a thread
> Which, ever as the seafarer undid,
> They rose or scantled as his sails would drive
> To the same port whereat he would arrive."

The Finlanders at one time drove a profitable trade by the sale of winds. *After* being paid, they knitted three magical knots, and told the buyer that when he untied the first he would have a good gale; when the second, a strong wind; and when the third, a severe tempest.* Sir Walter Scott also mentions that King Eric, also called "Windy Cap," could change the direction of the wind by merely turning his cap round upon his head; and old Scotch women are mentioned who, for a consideration, would bring the wind from any desired quarter.* The Mandan Indian rain-maker had a rattle, by the noise of which he called down rain from heaven by the simple process of keeping on long enough. It is safe to say that these are all fallacies.

From the rain-makers we may now turn for a moment to the almanack-makers, and any one who will look up an old almanack of the early part of the last century will find the greater part of it filled with lucubrations on the influence of stars and constellations; he will also find a column giving for every day the parts of the body which are particularly under the celestial influences on the given dates, and when one sees for the first time this column reading—head, chest, legs, knees, feet, &c., one wonders what it can mean; but it was then so well understood as not even to require explanation, and there was generally, too, a rude woodcut of a hideous human figure, tattooed with the various signs of the zodiac to show the same thing. The sort of knowledge that passed for meteorology in 1703 may be learned from the following extract from *Meteorologiæ*, by Mr. Cock, philomathemat. 1703—a rare book in the possession of Mr. Symons:—

"The twelve signs are divided into four sorts, for some be earthy, others watery, a third sort aery, and the fourth sort is fiery." The author then goes on to state that "Jupiter in the Skinker (whatever that may be) opposed by Saturn in the Lion did raise mighty south-west winds. . . . . Observe when a planet is in an earthy sign he was lately dried up by perambulating a fiery sign, and after that, immediately having made his progress in an earthy sign, is quite bound up from moisture."

It seems incredible that our ancestors, only a few generations back, could have bought, paid for, and believed such stuff as this. The early almanacks boldly gave a prediction for the weather for every day in the year, but after a time confined themselves to a general statement of the weather; for instance, *Partridge's Almanack* for 1835 has the following prophecy for June:—"Fertilising showers, attended with thunder and lightning"—this does for the first ten days. "Fair and at times hot" for the middle of the month, and "refreshing rain for the grass and corn" for any time between the 21st and the end of the month.

Authors of weather almanacks had already begun to seek safety in vagueness. Some of these almanacks rose to a great popularity on the strength of one lucky guess; and I think it is told of this same Partridge's almanack, or some other of the class, that it owed its reputation to a curious prophecy of extraordinary weather for July 31, when hail, rain, snow, thunder, &c., were freely indicated. Forgetting that the month had thirty-one days, the almanack-maker had omitted to insert the weather prediction for the last day, and a boy was sent from the printing office to know how the space was to be filled up. The weather prophet was too busy to attend to him, but at last, in a passion, said, "Put down hail, rain, snow, thunder, anything;" and the boy, taking it literally, told the compositor, who duly set into type the extraordinary prediction, and which, by a freak of nature, came true, and made the fame and fortune of the almanack-maker. This story, if not true, is at least *ben trovato*, and shows the force of the bard's statement—

> "Our indiscretion sometimes serves us well
> When our deep plots do pall."

The *British Almanack* for 1831, published by the Useful Knowledge Society, had no weather predictions.

Patrick Murphy published a popular weather almanack, and his fame is said to have commenced by a lucky hit in one of the earlier issues, by which he indicated which would be the coldest day of the year. There is a copy of this almanack for 1838 in the library of the Society, and some former owner has evidently taken the trouble to pencil in the actual weather opposite to that predicted. There were, according to this annotation, eighty-nine incorrect forecasts, ninety-one doubtful, and the rest correct.

This Patrick Murphy was not a mere charlatan. He had a system, and, though he differed from Sir Isaac Newton and the Royal Astronomical Society, he gave much study and research to the subject of meteorology, as shown by his various books. There was an Astro-meteorological Society as late as 1861, and we have some numbers of its *Records* in our library.

Next comes the subject of weather prophets as distinguished from mere almanack makers, and who profess, sometimes for pelf, at other times for honour and glory, to predict the weather for any future date. These are always arising, and they do not lack a certain number of followers, who, possessing a large angle of credence, duly trumpet forth the successes of their chiefs, when they are so fortunate as to make any. The stock in trade of a prophet is of a slender and cheap description. He must have an inventive mind, a store of self-confidence, an insensibility to ridicule, and, above all, a keen memory for his successes, and a prompt forgetfulness of his failures. He should by choice have a theory, and this should be of the elastic order, so that, if a predicted event does not punctually occur, he will be ready with a sort of codicil

* Olaus Magnus, *History of the Goths*, 1638.

* Notes to *The Pirate*.

to amend it. Hence we find that the firing of guns has been cited as a sufficient reason for falsifying a weather prediction; and railways, too, are said to have an adverse influence, one author (not a prophet) telling us that they may be considered as "large winnowing machines, perpetually fanning and agitating the air with prodigious power, ploughing the air, as it were, and causing waves of vast extent, which, invisibly enlarging like the waves of the ocean, probably meet each other, clash, and produce modified effects, as resultants from adverse motions."

One of the first weather prophets mentioned in that delightful old book, Stanley's *Lives of the Philosophers*, was Democritus, the Milesian, known as the "laughing philosopher," who foresaw a dearth of olives, and, by buying up all he could get, might have made a fortune, but gave it back to the bargainers with the remark, "You can see now that a philosopher can get rich when he pleases." Then there was Pherecydes, of whom Pythagoras was a favourite pupil, who predicted an earthquake three days in advance by the taste of the water from a certain well. Perhaps the earliest of all was Elijah, who from the top of Carmel pointed out the coming squall cloud and predicted a great rain. He forms a good model for imitation to the modern weather prophets, for he did not prophesy until he saw the storm coming, and he made no secret of his method. We have still amongst us in our country, mostly without honour, seers who supply us with weather predictions in various forms, from the modest duodecimo almanack to the flaring broadsheet which compels attention; but it would be a task too long to enter on a systematic refutation of their contradictory guesses at the weather. The last of these broadsheets that caught my eye had for the days of the gale of December, 1894, which Mr. C. Harding has described to us, the tame announcement of "generally overcast." This did not err on the side of boldness when considered with reference to one of the severest gales of the century.

A Spanish peasant whom I heard of in Andalusia, and who had the reputation of a weather prophet, wisely said, If you want to know the weather for to-morrow, ask me early in the morning. The Indian weather prophets who made a failure had to be silent altogether for the rest of their lives; and this causes us to regret that some of our own seers were not born in that distant land.

As to the so-called weather forecasts, they only come under the title of this paper when they fail, and as eight out of ten are said to be correct, I shall only say that they are honest attempts on the part of civilised governments to warn their people as far as possible against the march of known disturbances. I could wish that the term "weather indications" or "indicated weather" had been adopted, so as to make this plain to all, and that oftener, when the signs were vague, we had the simple announcement of no change indicated.

The director of this system so well known to us, and who is playfully called the "Clerk of the Weather," sometimes receives valuable hints, even from children; and I must quote one such communication.

"Please, Mr. Clerk of the Weather, tell the rain, snow, and hail to stop for the afternoon, and rain in the night."

I may conclude this section by saying, that it is a great fallacy to suppose that there is such a thing as a weather prophet. All the great authorities agree that in the present state of our knowledge no human being can correctly predict the weather, even for a week to come.

And now we must consider a class of weather fallacies of which the victims can only excite in a well-regulated mind feelings of sadness and compassion, rather than the ridicule to which at first sight they seem more naturally entitled. I mean those weather prophets in whom the delicate mechanism of the mind is touched by disorder or decay, even if it has not already fallen under the stroke of complete dementia, and who believe that they can not only foresee the weather, but, by an effort of their own minds, control the elements and compel the clouds.

These patients I had hoped only existed in small numbers; but, on perusing the correspondence of a prominent meteorologist, kindly lent me for the purpose, I find that there are many of this class, whose name, like that of the ancient wanderer among the tombs, is "Legion," and who still come on, each prepared to drive the chariot of the sun, or by an exertion of his own will, odylise (the word I suppose will come) all the powers of nature.

Dr. Johnson's Astronomer says in *Rasselas*: "Hear me, therefore, with attention. I have diligently considered the position of the earth and sun, and formed innumerable schemes, in which I changed their situations. I have sometimes turned aside the axis of the earth, and sometimes varied the ecliptic of the sun, but I have found it impossible to make a disposition by which the world may be advantaged. What one region gains another loses. Never rob other countries of rain to pour it on thine own."

This type of patient, as well as those who would use their supposed power for the purpose of creating fine weather during the holidays of the people, belong to the more noble sort, but there have been others, like the notorious Friar Bungay, who for sordid reasons have professed to exert a similar power. The only wonder is that anybody ever believed them.

Now, as this malady of the mind is not incurable, I will venture to offer a practical suggestion, and would recommend these patients who have nursed themselves into the belief that they possess the keys of the weather, to seek the hill-top on a summer afternoon—the air and exercise will do them good—and watch the fine fleeces of cumulus cloud as they sail majestically across the sky, each with its attendant shadow below. Let the patient concentrate his attention upon one single feathery cloud, and try by the exertion of his utmost force of will to make it pause for a moment in its career; and, if he fails—"as fail full well he may"—then let him banish from his mind for ever the idea that he can by his own will dominate the whole firmament; and, if he has ever gone into print upon the subject, let him go home, and, like Prospero, his prototype, say,—

> "Deeper than ever plummet sounded,
> I'll drown my book!"

and so save the world from the trouble of investigating much pure nonsense. To these sufferers I can only repeat the words of one of our own kings to the last man he touched for the evil: "I wish you better health and more sense."

I must be forgiven for having only made a selection from the vast catalogue of fallacies which have accumulated about the subject, and I must continue to regret that there are still people who are ready to believe that the saints' days rule the weather, that the sun puts out the fire, that warm water freezes sooner than cold, or that a man is a prophet because he says so himself.

This Society is clearing the ground of many weeds, and already the fallacy of the "equinoctial" gales has been exploded (by Mr. Scott), while the churchyard ghost of the supposed fatal "green Christmas" has been most effectually laid by a recent statistical paper by Mr. Dines.

Some one may ask, after all this clearing away of fallacies—What have we left? and I would venture to refer him to all the patient work which is being done in various countries, and by which a real Science of Meteorology is being slowly built up, while to the outdoor weather student I would offer this consoling reflection—there is still the sky.

THE FUTURE OF PROCESS ENGRAVING.

[Process Work.]

One would think on reading some articles in the lay press, aspiring to be critical of reproduction methods, that wood-engraving has taken a new lease of life, and that the half-tone process is doomed. Statements or inferences of this kind only excite the amusement of those who are "inside" the trade. Even the wood-engraver does not believe any such thing. Without doubt there has been a marked revival of wood-engraving of late, but a little goes a long way in making the times better than they have been for the unfortunate wood-engravers, and process workers will not begrudge them any crumbs of comfort. As a matter of fact, the whole of the wood blocks turned out in London in a week would not keep going a second-rate process firm if the same subjects were given out for process. Moreover, if a record could be made of the amount of process work done even in England alone, the total would exceed by many thousand times the output of woodcuts in the palmiest days of wood-engraving. It is a pity that some statistics cannot be prepared, but we are afraid it is hardly possible. We can, however, give one fact from our own experience, viz., that in an average month we have sold 250,000 square inches of zinc, and 50,000 square inches of copper for photo-engraving. We do not claim to supply the whole of the trade, but we can carry the comparison so far as to challenge any maker of boxwood blocks to show an equal record in any period of his business.

The point we wish to impress is that process engraving has taken a place, and supplied a demand that wood-engraving never filled. If incidentally the new method has absorbed also the work done by the old, it must be on account of some advantages which the latter did not possess. "Because of cheapness," is the answer that will be urged. But that is not the sole reason. It is because the half-tone process has come to be recognised as an absolutely faithful method of reproduction, and in looking at a good process block we experience all the delight of characteristic effect which we feel in seeing the original.

Process would have been even more popular than it is in this country if the printing had, on the whole, been better. The photo-engraver has been constantly handicapped by bad printing, and smudginess has come to be synonymous with half-tone. Even in our leading illustrated papers the printing of half-tone blocks is far from satisfactory; hence the comparisons which have been made by a non-technical public between half-tones and wood-engravings in the same issue. In America the case has been far different. There the process engraver has been backed up by the papermaker, the inkmaker, and the printer, with results well known. They have no need to attempt to revive wood-engraving, nor is anything of the kind being done; the only tendency is towards making half-tone as good as it can be, and a notable sign of the times is the very general practice of retouching half-tones with the graver, in order to get the effect of a wood-engraving. The improvement is wonderful, and, in comparison with the best examples, wood-engraving has not a "look in." We would strongly recommend process workers to study this latest advance in half-tone, for it will undoubtedly have a great bearing on the future of the business.

If the quality of a half-tone eventually depends not so much on the photographic processes through which it goes as upon the amount of skill in the retouching, competition will be lessened, because comparison

of work will be so obvious. At present, price rules everything, and half-tone work is so much alike—the difference between good and average work being only a slight degree—that they are too ready to believe that one man's work at sixpence an inch is just as good as another's at one shilling per inch.

It is rather difficult to indicate how to set about the study of improving half-tones by tool work. A wood-engraver is entirely at sea on a half-tone block, and we hear that in America, where wood-engravers are employed on process, the difficulty is not only to find suitable men, but also, when found, to train them to the requirements of this class of work. A "soft-metal," or copper-plate engraver, would be far more accustomed to the work of cutting on process blocks, but, unfortunately, the class of work they have been used to is so excessively mechanical that they would hardly be capable of appreciating the niceties of tone-rendering. The best thing, therefore, will be for the wood-engraver to take some lessons from a metal engraver, and for the rest trust to his own aptitude and practice to find out what kind of line adapts itself best to the half-tone. By-and-by probably process firms will train up from apprenticeship men whose special business will be the touching up of half-tones. Meanwhile we recommend all interested to study the examples of this class of work in the American magazines and periodicals. Some very good specimens are to be seen in *Harper's Magazine*, and the printing trade journals nearly every month give some results of this kind.

TESTS FOR SODIUM THIOSULPHATE.*

With the object of ascertaining what was the minimum quantity of thiosulphate that could be identified by means of the test, I again experimented with a weak standard solution containing one-tenth of a grain of sodium thiosulphate to each half pint of water. Having poured two drachms of the mixed test liquid into each basin, I added the standard thiosulphate drop by drop to the contents of the first, and distilled water to the brown solution in the other.

When 48 minims had been added to each, a distinct change of colour ensued. On comparing the appearance of the solutions, it was seen that, whereas the contents of basin number two retained their light orange-brown hue, those of number one had assumed a dark greenish-brown colour.

When altogether 180 minims of the thiosulphate solution had been added, this brown was converted into a yellowish green, and the further addition of 60 minims produced the characteristic blue precipitate.

Taking 48 minims as our index, we find that this volume of solution is equivalent to the one-thousandth part of a grain of crystallised sodium thiosulphate. The test is, therefore, one of considerable delicacy.

One or two other tests of a minor interest do not call for notice. The nitrate of silver test, though of some importance, has been left undescribed, on account of its being one which must be familiar to most photographers.

Before concluding, I intend to say a few words as to the tests which must be employed when it is desired to distinguish between the thiosulphates and the sulphites.

These two classes of salts exhibit a striking similarity in their chemical properties and reactions. There are, in fact, few if any of the tests for the former which may not be applied to effect the detection of the latter. Indeed, most of the tests for the thiosulphates which I have been describing, both in this and the former paper, might with equal propriety be styled tests for the sulphites. Like the thiosulphates, the sulphites decompose the iodine compound of starch, reduce a solution of potassium permanganate, produce a white precipitate in a solution of barium chloride, and a green precipitate in one of acidified chromic acid, and evolve sulphuretted hydrogen when treated with hydrochloric acid in the presence of zinc. A moderately strong solution of a neutral sulphite, when treated with ferric chloride, gives an intense blood-red colour. On the other hand, a moderately strong solution of a thiosulphate, when treated with the same reagent, turns black, then dark brown, then light brown, and finally pale yellow. With dilute solutions of the respective salts the difference in the colours is, however, so slight as to be hardly apparent. The test is therefore of little practical value, at least in so far as concerns the requirements of the photographer.

In a certain standard work on analytical chemistry I find it stated that the ferricyanide test already described gives a blue precipitate with the sulphites similar to that which it gives with the thiosulphates.

In the course of some recent experiments with this test, I had occasion to employ a solution of neutral sodium sulphite, and utterly failed to obtain a precipitate of any kind. A rich apple-green solution was, however, immediately produced.

There are at least two tests by means of which a sulphite can be readily distinguished from a thiosulphate. The first is the nitro-prusside test. This will be best described in the words of Fresenius, *Qualitative Analysis*, tenth edition, page 193):—"If an aqueous solution of an alkaline sulphite is carefully neutralised with acetic acid, or bicarbonate of soda is added to it, according as it has an alkaline or acid reaction (excess of the bicarbonate is without effect, but excess of caustic alkali or simple carbonate, or of carbonate of ammonia, prevents the reaction), and a relatively large amount of solution of zinc, mixed with a very small quantity of nitroprusside of sodium, be then added, the solution will become red if the quantity of the sulphite present is not too small; when, however, the amount of sulphite is very minute, the colouration makes its appearance only after the addition of some solution of ferrocyanide of potassium. If the quantities are not too minute, a purple-red precipitate will form when the latter is added. Hyposulphites (*i.e.*, thiosulphates) of the alkalies do not show this reaction."

The second test is of a much more simple character.

When to a weak solution of a neutral sulphite a few drops of a moderately strong solution of strontium nitrate are added, a dense white flaky precipitate of strontium sulphite is instantly produced. This precipitate is insoluble, or nearly so, in concentrated acetic acid, but dissolves with the greatest readiness in dilute hydrochloric acid.

When a thiosulphite is substituted for the neutral sulphite no precipitate is formed.

The test is thus one by which it is possible to effect the detection of sulphites in the presence of thiosulphates. Curiously enough, I do not find it mentioned in any of the standard works on analytical chemistry.

There are certain occasions on which the photographer will find it necessary to avail himself of the services of such a test. When the developer contains, as it often does, an excess of sodium sulphite, a small quantity of this salt is invariably carried over into the fixing bath, and is eliminated from the film only after thorough washing. By means of the strontium nitrate test, the presence of this salt can at once be shown, provided that the test be applied not to the water in the washing trough, but to that which drains off from the imperfectly washed film.

If no precipitate is produced, the nitro-prusside test should be applied to another portion of the liquid. Matthew Wilson.

* *Concluded from page* 556.

THE CITY AND GUILDS INSTITUTE EXAMINATION IN PHOTOGRAPHY.

The following is the syllabus of subjects for the examination to be held in May next :—

PHOTOGRAPHY.

Ordinary Grade.

The examination in the Ordinary Grade will consist of a paper of questions only.

Syllabus.—The examination will include questions founded on such subjects as the following :—

1. The elements of Photographic Optics. The Photographic Camera and its adjuncts, lenses, diaphragms, shutters, shades, &c.
2. A general knowledge of the practice and theory of the wet-plate process.
3. The practice and theory of the gelatine dry-plate process ; the composition of and defects in gelatine dry plates.
4. Various methods of fixing, developing, intensifying, and reducing negatives, with a general knowledge of the chemicals employed.
5. Silver printing, including vignetting and printing in clouds, toning and fixing.
6. Retouching and spotting ; mounting prints.
7. The lighting of the dark room.
8. The studio and lighting of the sitter.

Honours Grade.

Candidates for Honours must have previously passed in the Ordinary Grade.

The Honours Examination is both Written and Practical, and consists of two Sections :—A. Pure Photography ; B. Photo-Mechanical Processes.

Candidates will be examined in *one only* of these two Sections, and may select the particular Branch of practical work in which they desire to be examined.

In order that candidates may know what apparatus and material they will be required to provide for the practical part of the examination,

full information as to the practical tests may be obtained from the Local Examiner on the afternoon of Friday, May 8, for the Examination to be held on the following day.

The fee for the Honours Examination in either Section is *Three Shillings and Sixpence.*

SECTION A.—PURE PHOTOGRAPHY.

I. WRITTEN EXAMINATION.—Candidates will be expected to answer more difficult questions in some of the subjects for the Ordinary Grade, and, in addition, a knowledge will be required of—

1. The theory of the photographic image, of development, fixing, intensification, and reduction.
2. The theory of light as applied to photography, including a general knowledge of spectrum and orthochromatic photography.
3. The principles of photographic optics.
4. The theory and practical use of sensitometers for testing the speed and gradation of plates, and their uses in printing processes.
5. The general principles of various negative processes which have been employed at different times.
6. Platinotype, carbon and pigment printing, printing on argentic bromide papers; enamels.
7. Enlarging and making lantern slides in the camera.
8. Applications of photography to scientific purposes.

II. PRACTICAL EXAMINATION.—Candidates may be examined in—(*a*) *Studio work*; (*b*) *Copying or Reproduction*; or (*c*) *Landscape and Architecture.* They will be required to show proficiency in conducting any of the following practical operations appertaining to the branch selected:—

1. To take in a studio quarter-plate gelatine negative of some object to be indicated.
2. To take an artistic portrait.
3. To print, tone, fix and mount a silver, platinotype, or carbon print.
4. To test a sample of glass or fabric to be used in lighting the dark room.
5. To test the sensitiveness and gradation of a plate.
6. To find the focus of a lens either corrected or uncorrected.
7. To copy an engraving for a lithographic transfer.
8. To make an enlargement from quarter-plate.
9. To make a lantern slide by contact.
10. To make in the camera a lantern slide from a negative.

The Practical Examination will be held on Saturday, May 9, between 1.30 and 7, and at other times if found necessary.

SECTION B.—PHOTO-MECHANICAL PROCESSES.

I. WRITTEN EXAMINATION.—Candidates will be expected to answer more difficult questions in some of the subjects of the Ordinary Grade, and, in addition, a knowledge will be required of—

1. The theory and practical use of different kinds of sensitometers.
2. The processes of Photogravure.
3. The processes of producing "Phototype Blocks."
4. The processes of Photo-Lithography and Photo-Zincography.
5. The processes of Collotype (Collographic) Printing.

II. PRACTICAL EXAMINATION.—Candidates may be required to show proficiency in practical operations in one of the above processes, numbered 2, 3, 4, 5, including the preparation of negatives suitable for each class of work, from, (*a*) Pictures in colour, (*b*) drawings in monochrome, (*c*) originals in black and in tints, (*d*) natural objects.

The Practical Examination will be held on Saturday, May 9, between 1.30 and 7, and at other times if found necessary.

No examination can be held at any Centre except where arrangements for the practical Examination can be carried out, or where at least *four* candidates notify their intention of presenting themselves.

The Written Examination in the Ordinary and Honours Grades will be held on Tuesday, May 5, from 7 to 10.

A separate return of the exact number of candidates who will present themselves in each grade, and in each section and branch of the Honours Grade, must be forwarded to the Institute by April 1.

II. FULL TECHNOLOGICAL CERTIFICATE.—A Provisional Certificate will be granted on the results of the above examination. For the full Technological Certificate in the Ordinary Grade, the candidate who is not otherwise qualified (see Rules 40–1) will also be required to have passed the Science and Art Department's Examination in the elementary stage at least, and for the full certificate in the Honours Grade, in the advanced stage at least, in two of the following Science subjects:—

I. Practical, Plane, and Solid Geometry.	X. Inorganic Chemistry.
VIII. Light and Heat.	XI. Organic Chemistry.

III. WORKS OF REFERENCE.—*For the Ordinary Grade: Chemistry of Photography*, Meldola (Macmillan); *Instruction in Photography*, Abney (Piper and Carter); *Manual of Photography*, Hepworth; *Practice of Photography*, Chapman Jones (Iliffe); *Art and Practice of Silver Printing*, Abney and Robinson (Piper and Carter); *Materia Photographica*, Leaper (Iliffe). *For Honours* in addition to the foregoing: *Optics of Photography*, Traill Taylor; *Treatise on Photography*, Abney (Longmans); *The Chemical Effect of the Spectrum*, Eder; *Collotype and Photo-lithography*, Schnauss (Iliffe); *Photogravure*, Wilkinson (Iliffe); *Handbuch der Photographie*, Eder (Knapp, Halle); *Handbuch der Photographie*, Vogel (Berlin, Oppenheim); *Handbuch der Photographie*, Pizzighelli (Knapp, Halle); *La Photographie des Objets Colorés*, Vogel (Paris, Gauthier-Villars); *La Platinotypie*, Pizzighelli and Hübl (Paris, Gauthier-Villars).

THE COMBINATION OF NATURAL AND ARTIFICIAL LIGHT.

THE question of supplementing daylight, says Mr. J. F. Sachse in the *American Journal of Photography*, with a suitable artificial medium of requisite actinic power, has been agitated by various writers and professional portraitists upon both continents for the past year or two, special reference being made to studio work, as the method certainly shows advantage in many cases over the use of either daylight or magnesium alone as an illuminant.

Dr. Liesegang, in a late number of the *Archiv*, in enumerating some of the advantages, states that it is much easier to obtain a sharp and clear focus when the blitzpulver is used in connexion with daylight, all the difficulties experienced at night are removed.

Then in daylight the action of the sudden, sharp, bright flash of the blitzpulver does not act near so harshly upon the sensitive optic nerves of the sitter, and results in a much more pleasing expression.

As the chief advantage, the learned photo-scientist states that the combined process offers a much better opportunity for obtaining a soft and harmonious lighting and negative, much more so than an exposure made with a flash of blitzpulver in the dark, as all of the usual annoying hard high lights are entirely overcome, which usually result when a single source of extremely brilliant light is resorted to.

By the combined method we have a medium entirely within our control to bring about any effect desired by the simplest means—we can as we desire create at will more or less soft or contrasting negatives, all that is necessary being to move the sitter closer or farther from the window, as the case may be, or by the use of reflecting screens, or lengthening the daylight exposure a trifle.

In ordinary practice, however, it has been found desirable to regulate the light sources so as to be of an equal duration, as otherwise we are apt to disturb an even lighting.

In the combined process, daylight is here virtually used as a supplementary medium, and need not be bright or strong. Frequently the best results are obtained upon a cloudy day, or such as we have during the winter. It is in the latter season when this combined process becomes of interest and value to the professional portraitist.

M. Bovier, who conducts a well-known studio in Brussels, if we mistake not, has long practised this method at times when the daylight was insufficient for his purposes. In describing his method of procedure, he states that, after he has obtained the proper focus, and all is ready for the exposure, he uncaps the lens with one hand, and, at the same moment, or a second or two later, with his other hand he squeezes the bulb which ignites the blitzpulver.

The flash apparatus should be placed at the distance of about a yard from the camera, well to the front, either to the right or left of the camera, according to the judgment of the operator. It should always be elevated so as to throw the light upon the sitter at an angle of 45° to 50°. As soon as the blitzpulver has been set off, the lens is to be recapped, and the operation is over.

The time of such exposures is calculated to be about one-fiftieth of a second.

It is a curious fact that, in the resultant negative, the side of the sitter turned towards the window or daylight will be the shadow side, while the exposure toward the blitzpulver will be the light side.

To develop such exposures, Bovier uses the following formulæ:—

A.

Distilled water	750 c. c.
Sulphite of soda	50 grammes.
Pyrogallic acid	15 ,,

B.

Distilled water	75 c. c.
Carbonate of potash	10 grammes.

For use—to develop a plate say 5 × 7—place the exposed plate in a tray, pour over it sixty c. c. of solution A, after one or two minutes add fifteen drops of B. If the image does not appear in about thirty seconds, add fifteen more drops of B, repeat this as often as necessary up to the moment when the high lights appear, then let the process of development proceed without any further addition of alkali.

When greater contrasts are wanted, a few drops of a 10% solution of bromide of potassium should be added.

In connexion with this interesting subject, it is well to call the attention of the photographer who wishes to avail himself of this method of supplementing the natural source of light with an artificial medium to the fact that much depends upon the actinic power and rapidity of the latter. The magnesium preparation, known in both Europe and America as blitzpulver, seems to have proven its adaptability for this and similar purposes, while the attempts to substitute aluminium and

other metals with the view of cheapening the powder have failed in every case to produce a satisfactory illuminant, on account of the lack of actinic power of the substitutes employed.

In conclusion, the writer will add a word of caution, Too great care cannot be exercised in the use of quick-burning mixtures for photographic purposes.

Powders put up by unknown or unreliable parties, and whose only claim is their cheapness in price, should especially be avoided, no matter how attractive the label and name under which they are sold. Magnesium has a set price on the market, and the only way to reduce this is by either substituting a cheaper and less actinic metal, adulteration, or reducing the quantity of the metal magnesium.

Avoid all cheap flash mixtures, as they offer a source of danger without giving corresponding results, but confine yourselves to such as have been tried and found reliable.

HALF-TONE ENGRAVINGS BY THE ENAMEL PROCESS.

[Photographic Times.]

PHOTOGRAPHERS will, no doubt, agree that, considering its recent introduction, the extended use of process engraving has been most marvellous, and no less so has been its development in excellence. Within the last decade it was a secret watchfully guarded by the few who had laboriously studied and experimented until the reward of success was attained; but the results were so manifestly beautiful and interesting, that inquisitorial curiosity was not slow to set itself to discover the secret methods of the early manipulators, and with so much success, that new operators have started in every direction, each adding some new feature, or some fancied new wrinkle, peculiar and secret to himself, until the art has leapt into importance and excellence with such rapid bounds that there has been no time to acquire a history. Notwithstanding the extreme privacy with which the process has been guarded, there is not so much of difficulty in it but that it may be readily acquired by any one willing to put himself to a careful study of the principles of the art, with sufficient mechanical turn of mind and dexterity of hand, and the exercise of patience and perseverance, until it is attained. In the following pages is presented a description of the process so full in the varied operations, and of the essential and necessary minutiæ, that a careful attention to them can hardly fail to bring out successful results.

Initiatory Operations.—The process in its entirety consists of three distinct operations: 1. Making the negative. 2. The preparation of the metal plate, zinc or copper, to be engraved. 3. The etching; to which might be added a fourth, the mounting of the plate on a wood block preparatory to printing, but which is so entirely dissimilar from the process of engraving, and so purely mechanical, that it may scarcely be considered as belonging to it further than necessary to make available to its ultimate purpose the plate which has been already completed so far as engraving is concerned. These several operations we will endeavour to explain in as minute and practical a manner as possible, both as to formulæ and method of manipulation, so that the tyro may attain to a degree of excellence proportionate to his intelligent apprehension and diligent and persevering prosecution of the methods described.

The Negative.—Gelatine dry plates are now specially manufactured with a view to suiting the process, and, no doubt, when the light employed is of a character that will secure steadiness and uniformity—as when the electric arc light can be made available—these will be found very convenient; but, as the novice will probably be dependent on the ordinary light from the luminary of day, which is very variable and liable to cloud and shadow, the dry plate would be found too uncertain in result, and the consequent waste too expensive for the beginner. He will hence find it most economical to adopt the wet-plate process of the old-time photographer. In prosecution of this, his his first attention will be to the choice of glass, for which he will find crystal plate, about one-eighth of an inch in thickness, to be the most suitable, by reason of its being uniformly clear and free of bubbles and scratches. There are other makes, however, of varying excellence, and it will be well to see that what he uses is of good clear colour, flat, and as free of imperfections as he can procure it.

Cleaning the Glass.—Having procured the glass, the next operation is to have it thoroughly cleaned; and in this, as, indeed, in every subsequent part, scrupulous cleanliness is a *sine-quâ-non* to success. This is best effected by allowing it to steep in a strong lye for several hours, say over night, and, after a thorough rubbing on both sides with a piece of clean coarse cloth under the tap, put it into a dilute solution of nitric acid—of, say, three ounces to the gallon of water—and let lie for at least half a day, and none the worse for a longer time. From this it should be again washed and rubbed with the canvas cloth under the tap, until it is seen to be absolutely clean by examining it toward the light. It is sometimes found that the water from the public reservoirs, from impurities held in solution, leave a stain or cloud on the plate after drying; in such case it will be needful, after washing, to give a last rinsing in pure water, either distilled or melted ice, filtered, which may be contained in a dish laid conveniently for the plate to be laved in it.

Albumenising the Glass.—The next operation is the albumenising of the glass. This is necessary as a substratum for the collodion to be afterward flowed over it. This is done immediately after rinsing from the pure water last used in washing. The proportions of albumen to water are very varying among operators in practice, some using the white of one egg to twenty-five ounces of water, while others give to the same quantity of albumen eighty ounces of water. Any proportions between these will work, the main idea governing being the injury to the silver bath, which may result by the gradual communication to it of organic matter from this source. It will readily be understood, however, that a very thin or delicate solution is all that is necessary, and the white of one egg to forty-eight ounces of water will be a desirable medium to adopt.

Albumen Solution.—To prepare the albumen solution, take the white of a fresh egg, careful that none of the yelk or the germ is accidentally admitted. Break this into a froth with an ordinary egg-beater, and mix with forty-eight ounces of water. This should be the purest procurable, distilled, or from melted transparent ice, and filtered before use. Thoroughly mix by beating again with the egg-beater, neutralise by adding five or six drops of acetic acid, and let stand over night. Before using, it must be frequently filtered through absorbent cotton until it is seen to be thoroughly clear and limpid, and with no shreds of albumen visible. To get it to this condition will necessitate filtering three or four times, and it will be found most convenient to take several graduates of varying sizes with a funnel containing the cotton in each, and pass from one to another, till the last be found in condition of sufficient purity to be flowed over the plate.

Flowing the Plate.—With the glass perfectly clean, immediately after rinsing in pure water, as above recommended, take the graduate containing the last filtered albumen solution in the right hand, while the glass is held in the left by the lower left-hand corner; pour the solution copiously on the plate at the upper right-hand corner, and allow to flow gradually over it, and run off at bottom. Flow at least twice, as much as possible preventing any from reaching the back, because of its not being necessary there, and of the injury it may afterwards inflict on the silver sensitising bath. After flowing twice, set up the plates on a rack to dry spontaneously, being careful to arrange them with the albumen side turned one way, as it is hardly possible to discern after drying which side has been albumenised. After drying, they may be stored in some convenient cupboard or shelf, and protected from dust by a cover being kept over them. Any number may be thus prepared at once, as they will keep for any length of time.

The Collodion.—The next further stage in the process is the preparation of the collodion. This may be purchased ready prepared, but no work on the subject would be complete without the formula for making, and its preparation presents no great difficulty. There are many recipes, varying somewhat with the fancy which some operators think they have discovered in a few grains less or more of some one or other bromide or iodide salt, but all practically bringing out the same result, the supposed excellence of one more than another probably resulting from the methods of handling the after-operations. The following will be found to be one of the best:—

Alcohol, 95 per cent.	8 ounces.
Iodide of ammonium	48 grains.
Iodide of cadmium	24 ,,
Bromide of cadmium	16 ,,
Pyroxyline	120 ,,
Sulphuric ether	8 ounces.

Dissolve the salts by grinding each separately in a mortar with a portion of the alcohol in the above order; add the pyroxyline and shake well; last, add the ether, and, after shaking, the whole will be seen to dissolve into a clear liquid of amber colour. It will be sufficiently ripened to work in a few hours, but will improve as it gets older. The ether being very volatile, it should be kept in glass-stoppered bottles. There are bottles manufactured for the purpose—"collodion-pourers"—but in the absence of these an ordinary wide-mouthed bottle with glass stopper is an excellent substitute. Ir allows all impurities to settle in the bottom, so that the collodion may be poured out without disturbing them, and the formation of the bottle is also such that air bubbles are not formed when pouring out the solution.

Flowing the Collodion.—To so flow the collodion over the plate as to give a uniform coating requires a little dexterity that can only be acquired by practice. Take hold of the glass by the lower corner in the left hand, stretching the forefinger along the edge so as to give support at that point, while the thumb and middle finger support the bottom. Now, holding it as level as the eye can judge, pour a pool of collodion about the centre, or nearer the top, of the plate with a steady, even flow, and of sufficient quantity to cover it. Incline the glass so as to make the collodion flow first to the upper right-hand corner, then over to the left, and then down to the bottom, allowing the surplus to flow off at the lower right-hand corner into a wide-mouthed bottle, kept for the purpose, and fitted with a stopper or cork. This can be afterwards utilised by filtering, and adding to the stock bottle.

The important object is to have a regular coating all over the plate; and to attain this there must be no hesitation in the pouring and flowing over the whole surface, and then, by raising it into a perpendicular position, allow the surplus to drain, at the same time giving it a to-and-fro motion sideways, but by no means such as would send it back over the plate. Having an eye to the careful preservation of the silver bath, wipe off all superfluous collodion that may have got on the back of the glass. It will set in a few seconds, indicated by its drying or thickening so as to take the impress of the thumb at the lower corner where last poured off. Whenever this is noticed, it is ready to be lowered into the sensitising bath, which should be done without delay.

The Silver Bath.—It is very important that the silver bath should be made from the purest materials. The water especially should be carefully filtered and purified. The most efficient method of accomplishing this is to take distilled water, or transparent ice melted; add to it a few crystals of nitrate of silver, put into a bottle of white glass, and set in the sun. In a few days it will darken corresponding to the amount of organic matter contained in it, which will be precipitated and can be filtered out. Make up a sufficient quantity to fill the bath-holder of the size determined upon. This may be a flat dish—which will call for a less quantity of silver, but not on that account more economical—or a regular glass holder with box and cover, which is greatly to be preferred, being much more easily managed in respect of the plate, but also for keeping the bath in better condition. A size 11×13 will be found a serviceable and convenient size to work with. This will require 100 ounces, which should be of the strength of forty grains to the ounce, tested by an argentometer. Put this quantity into a large bottle of white glass, add to it a few drops of concentrated ammonia, to neutralise, until it just turn red litmus paper blue, and set in the sun for several days to clear. Any organic matter contained in it will be precipitated, or adhere to the sides of the bottle, which must be thoroughly filtered and cleaned out. Filter again and again until assured of being thoroughly pure, by its remaining clear. When ready for use, put into the bath holder, add a few grains of iodide of potassium—five grains will be sufficient—and of nitric acid, C. P., a few drops at a time, until it turns blue litmus paper a decided red, when it will be ready for use. In place of adding five grains of iodide of potassium, a collodionised plate may be placed in the bath and allowed to remain over night, when sufficient of the iodide will have been communicated to it from the collodion.

The Care of the Bath.—The care of the bath is a matter of much importance, as it is liable at times to go out of order for causes not easily discoverable, there being many that affect it, which may set their evil influences into operation suddenly; but the chief source is from organic matter introduced through the medium of the collodion and the glass plate, and should be carefully guarded against. In time it will have become so surcharged with alcohol and iodine from this source as to require doctoring, which condition may be known by the developer flowing over the plate as if meeting with a greasy resistance, and later by minute pinholes, like star dust, being observable in the negative. The first of these may be corrected for a time by the addition of a little alcohol to the developer; but be assured that the other is not far away, and then it will be needful that drastic measures must be adopted. To this end take a quantity of pure distilled water, or melted ice purified, equal to the bulk of the bath; pour the bath into it, filter out the iodides and simmer down by gently boiling in a granite or porcelain dish until it is reduced to considerably less than the original bulk. This operation will have evaporated out the alcohol. Let it now be brought to the strength of forty grains to the ounce by the addition of pure water, neutralised by the addition of a few drops of concentrated ammonia, and set in the sun, where the organic matter will be precipitated, and may be filtered out. A longer sunning and filtering will further improve it, and, after assurance by its remaining clear, it may be acidified as at first and again put to work. Because of the liability of the bath to go out of order, it is well to have one or two distinct baths under process of sunning and purifying, besides the one in use, and so save save disappointment at inopportune times. Before beginning the work of the day the bath should be skimmed over with a piece of clean blotting-paper. (*To be continued.*) ROBERT WHITTET.

Our Editorial Table.

DOUBLE ROLLER SQUEEGEE.

R. & J. BECK, Cornh ll.

THIS form has its two rubber-covered rollers mounted a little distance apart, which is stated to be a great improvement on the single-roller squeegee, and will be found invaluable for drying and mounting prints. It is made in three sizes, the rollers being respectively six, nine, and twelve inches in length. Other uses than those mentioned will be discovered after the owner becomes familiar with the instrument. Prices from 4*s.* 6*d.* to 6*s.* 6*d.*

VALKYRIE III.

By ADAMSON & SON, Rothesay.

A CHARMING picture of the famous yacht, *Valkyrie III.*, to which so many eyes are now mentally turned as the challenger for the American Cup. It is needless to say that the photograph was taken in the waters of the Clyde previous to the vessel crossing the Atlantic. It is both interesting and beautiful.

STENOPAIC OR PINHOLE PHOTOGRAPHY.

By F. W. MILLS and A. C. PONTON.

To those who wish to study the subject of pinholes as substitutes for lenses, this *brochure* will afford interesting information. It is compiled from various authorities, and presupposes an acquaintance with algebra. It contains twenty-seven pages, and is published by Dawbarn & Ward, Limited.

THE PHOTOGRAPHER'S EXPOSURE BOOK.

By F. W. MILLS.

ONE exposure book is usually very much like another. In this the exposure of each plate is supposed to demand eleven different entries, which the really practical photographer will be inclined to kick at as being too serious an encroachment on his time, making a toil of a pleasure. Published by Dawbarn & Ward, Limited.

News and Notes.

EAST LONDON PHOTOGRAPHIC SOCIETY.—The Fifth Annual Exhibition will be held at the New Tabernacle, Old-street, E.C., on October 28 and 29, 1895. A silver and bronze medal is offered in each of the following open classes, also a certificate in Class D, for competition under the rules and regulations:—Class A, Champion, for pictures that have already received awards in open competitions. Class B, for pictures that have never taken an award in open competition. Class C, Lantern Slides, sets of four. Class D, for pictures, open to all persons who have never taken an award in any open competition. The Judges will be duly announced. Entry forms and all particulars can be obtained from Mr. F. Uffindell, 29, Scrutton-street, Hon. Exhibition Secretary.

THE GERMAN EMPEROR'S VISIT TO THE LAKE DISTRICT.—The *Illustrated London News*, of last Saturday week, contains a full-page illustration of the German Emperor on the landing-stage at the Old England Hotel. The illustration was reproduced from one of the many photographs which Mr. R. T. Ford (Manager, Brunskill & Co.) obtained under great difficulties. We understand the *Illustrated London News* bought the whole series. Messrs. Brunskill & Co. have received the following letter from the Earl of Lonsdale:—"Lowther, Penrith, August 27, 1895. Dear Sirs,—I am requested by the Earl of Lonsdale to say he would very much like an album similar to the one you presented to His Imperial Majesty the German Emperor upon the occasion of his visit to Bowness.—I am, yours faithfully, J. CLARK. Messrs. Brunskill & Co., Windermere."—*Taken from the "Lake's Chronicle," August* 28, 1895.

THE annual report of the Science and Art Department has been issued by the Committee of Council on Education. It shows a great increase in the number of science schools, and in the number of students attending the various classes, compared with the previous year. The results of the May examinations were eminently satisfactory. No fewer than 103,396 students were examined, 188,773 papers worked, 82,406 papers passed, and 49,990 first classes awarded altogether in elementary and advanced stages. It is gratifying to note that the new system of payment by results to science schools has been a success. The payments for 1894 amounted to 140,391*l.*, or 10,382*l.* more than in the preceding year. It appears that the most popular subject with the students is drawing. During the year 20,206 elementary schools, with 2,155,311 scholars and 16,842 pupil teachers, were examined under the regulations of the department. The grants for this subject amounted to 159,072*l.*, or an increase of 7000*l.* on the preceding year, and no fewer than 4926 schools were described as "excellent," and 13,462 "good."

FORTHCOMING EXHIBITIONS.

1895.	
Sept. 23	*Leeds. G. Birkett, City Art Gallery, Leeds.
,, 23–28	*Westbourne Park Institute.
,, 24	*Royal Cornwall Polytechnic Society. Edward Kitto, The Observatory, Falmouth.
,, 30–Nov. 2	*Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 30–Nov. 14	*Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
Oct. 28–Nov. 2	*Southport. G. Cross, 15, Cambridge-arcade, Southport.
Nov. 19–21	*Hackney. W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 28–30	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

RECENT PATENTS

APPLICATIONS FOR PATENTS.

No. 16,045.—"Improvements in and connected with Photographic Dry (or Wet) Plates and Films." J. W. Collings.—*Dated August*, 1895.

No. 16,070.—"Improved Stereopticon Panorama Apparatus." Complete specification. C. A. Chase.—*Dated August*, 1895.

No. 16,117.—"An Improved Finder for Photographic Purposes." A. Heywood.—*Dated August*, 1895.

No. 16,315. "Improvements in and relating to Photographic Change-boxes."—W. W. Beasley. *Dated August*, 1895.

PATENTS COMPLETED.

Improvements in or relating to Photographic Cameras.

(A communication from Lucien Joux, of 42, Boulevard Bonne Nouvelle, Paris, in the Republic of France.)

No. 20,343. Alfred Julius Boult, 323, High Holborn, Middlesex. *August* 3, 1895.

The form of the apparatus comprised in this invention approximates to that of a double or twin camera, and is constituted substantially by the combination of two boxes or cameras, one being contained and operated within the other, after the manner of bellows, and jointed in a similar way at the upper side, at the same end as the lens, by means of a hinge, with an internal shield or cover to protect it against any penetration of the rays of light.

The outer box is quite open on one side, while the inner one, being similarly open on the opposite side, thus supplies the place of the missing side of the former.

The form of the front part of the camera is that of a cone viewed in longitudinal section, and in it are fitted the lens, the shutter, and the mechanism operating the latter. As these different parts may be made according to any suitable system known, it is unnecessary to describe them.

In continuation of the conical portion of the camera, follows a rectangular part, forming, inside the inner box or camera, the magazine or plate-holder, wherein the plates are stored, each held in a separate metallic frame, their number and dimensions varying, of course, with the size of the apparatus.

In the outer camera box, at the junction of the conical with the oblong portion, are arranged two rods, jointed to the frame, and having hooks at their free ends. These hooked rods are intended to keep well to the front the plates contained in the magazine formed by the rectangular portion of the inner camera box; sufficient play is provided, therefore, in the apparatus by means of recesses formed in the longitudinal side walls of the inner box. These hooked rods are linked together by a tie, and provided each with a spring, pressing with their free ends against suitable abutting pieces provided for the purpose in recesses; these springs are enlarged and strengthened by suitable strips which keep them closely pressed against the front of the first plate-holder or frame in front of the pile of plates in the magazine.

The open surface of each side of the interior of the inner box is fitted with two strips, united by a tie, and symmetrically arranged, forming ledges which carry the ends of the frames holding the plates, and of such a length that the first, or front plate (on the side facing the lens) is free, and does not rest upon them, so as to allow of its being removed or conjured away, so to speak, as if by a trick.

The front plate is maintained in position in a vertical direction by the hooks on the above-mentioned rods, and in the horizontal direction by two ledges or strips, arranged symmetrically, and at a suitable height on one of the side faces or jambs of the recesses of the inner camera box.

The back or rear end of the box has its outer side rounded, to form an arc of a circle, struck from the point of oscillation as a centre, *i.e.*, the axis of the hinge on which the box swings, so that the end is always hermetically closed against the upper edge of the back of the outer camera box, the hermetic joint or closure being formed by longitudinal pads exerting pressure by means of springs specially arranged in grooves formed for this purpose in the inner faces of the longitudinal walls of the outer box against the outer faces of the longitudinal walls of the inner box, thus all access of light to the interior of the apparatus is prevented. A transverse pad, similarly supported by a spring, and ledged in a suitable groove in the inner face of the rear end of the outer box, presses against the circular outer face of the rear end of the inner box, so as to make a hermetically tight joint therewith, and also thus prevent all access of light to the interior of the apparatus.

A hook-shaped stop secured to the open surface of the interior of the inner box at the rear end limits its movement outside the outer box; suitable plate springs, arranged symmetrically and parallel to each other on the flat inner surface of the back of the inner box, exert a strong pressure upon the pile of plates in the magazine formed in the rectangular part of the apparatus; two springs, secured to the back of the outer box serve, in the "trick" position, to support the plate when removed by the "trick" action, at a proper height to enable it to be restored to its place in the magazine—not in front this time, but behind all the other plates; two other springs, formed by flexible cheeks, symmetrically arranged and lodged in recesses cut for the purpose in the inner longitudinal walls of the outer box, are intended to guide and hold the plate passed from front to rear, in the direction of its length, in a position adapted to facilitate its replacement in the magazine behind the other plates.

When the apparatus is closed, or folded together, these springs are lodged in suitable recesses prepared for them in the interior of the outer box.

The external face of the back of the outer box is provided with a door for inspection, that of the upper side of the inner box with a ring jointed and pivoted, and so arranged as to serve as a bolt or catch to secure the inner box when the apparatus is closed and out of use; this ring also affords a means of handling and manipulating the inner box relative to the outer one; a flap door in the upper side of the inner box enables the plates to be stored in the magazine and removed therefrom as may be required.

Having thus described the construction and arrangement of the apparatus, I will now proceed to set forth and explain the method of its operation and use.

The apparatus being closed, the storing of the plates in their frames or holders in the magazine is effected by opening the trap for the purpose, and introducing them into the magazine in the inner box; the plates are restrained by plates or ledges in front, and supported below by the ledges presenting their sensitised surfaces on the side towards the lens.

All the plates being stored away in place, and forming a block or pile supported by the springs at the back, the first or front plate is seized on its upper edge by the hooks on the rods previously described, while its lower edge has passed beyond the supports upon which the other plates rest, and is therefore free.

The first plate having received the picture, the next step is to abstract it for transfer to the back. To this end the apparatus must be opened out, *i.e*, placed on end with the lens uppermost, and its axis vertical instead of horizontal, and this is effected by turning the handle or ring on the upper side, so as to release the catch and unfasten the inner box, then, while holding the outer box firmly with one hand, with the other the inner box is drawn out so that it opens by rotating on its hinge, until, when fully opened, it is arrested by the stop.

During and by this movement all the plates are carried along with the inner box, excepting only the first plate, which has just been exposed, and received the photographic image; this front plate being held by the hooks as explained, and retained by the arms secured to the stationary side of the outer camera, is gradually drawn out from the position hitherto held by it in front of the block or pile of plates, sliding along the frame of the next adjacent plate until it is clear of them, the bottom end of the plate, as the motion proceeds, overbalancing the upper end and dropping, when completely clear (*i.e.*, when the movement is arrested), first into an intermediate position, and finally into a position somewhat slantwise on the back of the outer box, with its sensitive film still uppermost, and turned towards the lens, and sustained horizontally and vertically (or laterally) by the springs placed there for the purpose, which springs have been liberated by the withdrawal of the inner box from within the outer one, and have consequently resumed their normal configurations and positions, in which they are adapted to hold and guide the exposed plate in position and manner suitable for the next stage of the operation which completes the "trick."

This final stage is effected by simply closing the inner box, and restoring it to its former position inside the outer one, whereby, as it were, automatically the exposed plate is caused to re-enter the inner box at the back, to slide up the guide springs, and thus be pushed into place behind all the other plates with its sensitive film towards the lens.

The inner box having thus been completely closed within the outer camera, the original relative positions of all the parts are established, excepting that the plate which was in front has undergone exposure, and is now behind all the rest, having been conjured away, so to speak, and "passed" by a sleight-of-hand trick from the top of the "pack" of slides to the bottom, by a single swing of the inner box out and in again, while the still unexposed plate which was second, now occupies the first or front place, ready for immediate exposure, having its sensitive film turned to the object glass, and being, like its predecessor, sustained in front by the plates or flanges carried by the hooks above, unsupported by the ledges and free, after exposure, to pass through the same process of removal from front to rear by the so-called "trick" apparatus hereinbefore described.

Improvements in Frames or Mounts for Photographic and other Pictures or Objects.

No. 23,113. Strong & Co., Limited, 8, Leonard-street, London, and Charle Welsh, 8, Leonard-street, aforesaid.—*August* 3, 1895.

This invention is designed to provide an improved construction of frame into which photographic pictures, such as "opal" mounted photographs, can be inserted by simply sliding the same into a slot or opening in the top edge or part of the front or front flat of the frame, and thereby into the proper space or recess between the front and back of the frame, so that the photograph and its supporting glass or the like is safely held.

This slot is preferably formed at the upper edge of the front flat, and so that from the front, looking at the picture, it shall be practically invisible.

The back of the frame is, also preferably, formed double, one surface being substantially flush with back surfaces of the slot, and lying closely in rear of the inserted picture; the other surface lies in rear at some distance, leaving a hollow space, the slides being closed by the inclines, curves, or like parts of

the frame, and thus forming by such means a light and strong frame, to the eye apparently solid.

This frame is covered with plush or other covering, glued or attached to the leather board or other similar board of which the frame is manufactured.

The frame may be employed for other descriptions of pictures than photographs, or it may be used for the display of any other articles for which it is adapted.

By these means we attain the effect of a substantial, strong, cheap, light, and ornamental article, possessing all the benefits of the ordinary heavy wooden or other frames, with their hinged, closable backs, without the disadvantages of weight, high cost of manufacture, heavy costs of freight, and the like, and, besides, we secure extreme simplicity in use with secure retention of the article inserted.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

September.	Name of Society.	Subject.
9	North Middlesex	Technical Meeting.
9	Richmond	
10	Birmingham Photo. Society	Excursion: Moreton Old Hall, Cheshire. Leader, Thomas Taylor.
10	Hackney	
10	Manchester Amateur	
10	Paisley	
10	Rochester	
10	Royal Photographic Society	
10	Stockton	
11	Leytonstone	
11	Munster	
11	Photographic Club	
11	Southport	Notes on Copying and Enlarging.
11	Stockport	
12	Glossop Dale	
12	Hull	
12	London and Provincial	
12	Manchester Photo. Society	
12	Oldham	
13	Bristol and West of England	
13	Cardiff	
13	Croydon Microscopical	Conversational Meeting.
13	Halifax Camera Club	
13	Holborn	
13	Maidstone	
14	Hull	
14	North Middlesex	Excursion: Perivale and Greenford.

Hackney Photographic Society.—August 27, Mr. J. O. Grant presiding.—The Hon. Secretary announced particulars concerning the forthcoming Exhibition, and a discussion took place on various matters connected therewith. Members' work was shown by Messrs. Roofe and Rawlings. The rest of the evening was devoted to a sale and exchange among the members of miscellaneous photographic apparatus and materials.

Leytonstone Camera Club.—On Saturday, August 24, the Secretary had on exhibition one of the improved bull's-eye cameras and an Eastman pocket Kodak, kindly lent by Messrs. Whittingham & Co. The working details of these instruments were gone into and discussed, there being a goodly show of members present.

Saturday, August 31, Mr. H. P. Hood conducted an outing to Kew Gardens, the members mustering in fair numbers.

Liverpool Amateur Photographic Association.—The usual monthly meeting was held in the Club Rooms, Eberle-street, on Thursday evening, August 29, Mr. Paul Lange occupying the chair in the absence of the President.—Eight new members were elected. At the conclusion of the formal business the meeting turned into a social for smoking and coffee, during which Mr. Paul Lange demonstrated the printing of the new platinotype C.C. (rough surface) paper. Numerous questions were asked, which were answered by Mr. Lange.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

ALUMINIUM LENS MOUNTS.

To the Editor.

Sir,—I have read with much interest Mr. Warburton's protest against the exorbitant price charged for aluminium lens and camera fittings. Permit me to quote a striking proof of the cheapness with which the metal may be worked. I have in my possession an aluminium cycle tyre pump about two feet long—it cost 6*s.* 6*d.* In brass the price is 5*s.*—I am, yours, &c.,

H. Graves,
Oxford University Photo and Bicycle Clubs.

Clay-next-Sea, Norfolk, August 28, 1895.

A YORKSHIREMAN IN LONDON.

To the Editor.

Sir,—This time last year, having business in London, I was asked by a friend to call on a few photographic stores and purchase the best half-plate camera that would take stereoscopic pictures as well, and be easily convertible; not but that we could get several in Yorkshire and Lancashire, but my friend was not satisfied with the division or septum, and thought he would get the latest in London. Will you believe it that I called at six large establishments and could not find one at all! Some had the old-fashioned $6\frac{3}{4} \times 3\frac{1}{4}$ cameras, but no others did I meet with. Some will think this impossible, but it is, nevertheless, true. At one place I told them I had had one twenty-five years. The manager said they did not cater for faddists, but made what they considered best, and their customers must follow them. At another they could make one to order; at another they believed two firms in Manchester, Chadwick and Chapman, made a lead of them, but they were never asked for them. Having followed photography since the early days of Roger Fenton and Francis Bedford, I must say I was astonished, as I consider a half-plate arranged for stereoscopic is the best investment you can have, as you can have half-plate, stereoscopic, or lantern slides all in one. Why this difference between North and South, as I could have got ten cameras in either Leeds or Bradford before starting, made this way?

Having been in the trade thirty-three years, it struck me there was a great difference in the dealings between buyer and seller. In London the buyer does not get into the confidence of the seller as in the North, and in the South he does not get as much information. In the North an assistant has to have a good all-round knowledge of photography, and impart what he knows; in the South, from my insight, if they have the knowledge they do not impart it. It occurred to me that a London salesman could not make a living down here.—I am, yours, &c.,

August 29, 1895. Medico.

STANLEY SHOW PHOTOGRAPHIC SECTION.

To the Editor.

Sir,—Will you kindly announce in your columns that at the nineteenth annual Stanley Show will be held the fourth Photographic Section, from November 22 to 30? Prospectuses, &c., will be ready shortly, and may be obtained from— Yours, &c.,

Walter D. Welford, *Manager.*

59 *and* 60, *Chancery-lane, London, W.C.*

Answers to Correspondents.

*** *All matters intended for the text portion of this* Journal, *including queries and Exchanges, must be addressed to* "The Editor, The British Journal of Photography," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* Henry Greenwood & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

Photographs Registered:—

John Terras, Lawhead View, Markinch, Fife, N.B.—*Portrait of the Rev. John Alexander Shannon; two portraits of the late John Balfour of Balbirnie.*

W. Dean.—We have an article on the subject in type intended for the forthcoming Almanac. It would be much better to wait till the beginning of December, when it will be published.

Celt.—Messrs. Furnival & Co. are the only firm we know of in England that make collotype power machines. We do not know their prices, but you can ascertain them, doubtless, on application.

AMATEUR (Northwood).—The lens seems to have performed its part of the work exceedingly well. But the seeming falling off in definition at the spots pointed out appears to us to be owing to a local defect in the film.

LEEDS.—The "phenomenon" is simply a flare spot, due to the lens. The simplest remedy is to return the lens, together with one or two of the pictures, to the makers of the instrument. They will then do the needful.

MR. W. GIRLING writes: "*Re* 'Venice' in 'Answers,' p. 544. Some time since I purchased an albumenised paper with a green tint of W. Watson & Sons, 313, High Holborn, London, W.C., which answers admirably for water and foliage."

H. J. (Carmarthen).—Accumulators are of no use for the electric light unless there are means at hand for charging them. We should advise you to obtain a cheap modern work on electricity, as you appear to be quite under a misconception as to accumulators or secondary batteries.

MR. ERNEST BROWN says: "In reply to 'Venice,' *re* some moonlight pictures which were printed on green-tinted paper, the result can be obtained by printing on sea-green carbon tissue, which can be bought from Elliott & Sons or the Autotype Company, or by sending his negatives to some trade printer who works the carbon process."

H. A.—We have made no experiments with the glasses you name. In orthochromatic work (trees and landscapes), we have, however, succeeded admirably by the use of colour-correct plates in conjunction with a pale yellow screen, such as that issued by the Britannia Works Company, Ilford.

T. REDWAY.—You have evidently misconceived the value of the stops. You say "there is not much difference in the size of the aperture of *f*-11 and *f*-22. Still, I gave double the exposure, and yet the negative is underexposed." Instead of double, four times the exposure is necessary with *f*-22 than what is given with *f*-11 to make the results equal.

J. MATHERSON.—No matter what brands of plates we employ, we always take the precaution to back them when taking interiors. Unless this is done, halation must be expected from the windows. The example enclosed is very bad in that respect, but is not a bit worse than might have been anticipated from such a subject on an unbacked plate.

F. W. A. C.—If the facts are as stated, and the verification of them reliable, we should certainly say have nothing to do with the concern; or, if you do, place yourself in the hands of a shrewd solicitor, telling him all that you have been told about the affair. The whole thing looks suspicious, more particularly the extreme haste.

BUILDER.—1. The ground plan of the studio will do very well, but we should advise it to be a little longer and a couple of feet or so wider. We prefer the design shown in sketch No. 1, but with the ridge in the centre. So much has from time to time been written on designs for studios, that nothing more remains to be said. It is not on the form of the studio, but on the ability of the worker, that artistic effects depend.

M. A. C.—We can offer no opinion as to whether ceramic photographs would "take on" in your business. You ought really to be a better judge of that than any one else. We should advise you to give it a trial. The experiment will not be costly, as you can get the work done for you. A few pounds' worth of specimens from your own negatives would enable you to form an opinion.

ROBIN HOOD.—Carbon prints, developed on glass and mounted with the full gloss, can be embossed as cameos in precisely the same way as enamelled albumen prints; indeed, the carbon process is the simplest method of making that class of photograph. Carbon prints can also be burnished in the ordinary way, the only precaution necessary is that they be quite dry before they are passed through the burnisher.

D. WALDEN.—The making of photographs copyright, under the International Copyright Law, is a very simple matter. All that is necessary is to make the picture copyright according to the law of the country of origin, and the copyright is secured in the other countries. Supposing the country of origin is England, simple registration at Stationers' Hall is all that is required to secure the copyright in all the countries that are signatories to the Convention.

F. G. H. (Huddersfield).—The so-called postage-stamp portraits may, of course, be printed by any process. Negatives can be masked either in the camera or in the printing. If the sheets are required to be perforated, suitable apparatus for perforating is necessary, but the gum can be applied with a brush. Marion & Co., as well as most other large houses, will supply all the necessary appliances and also quote prices. No work is published, or likely to be, on such a simple matter.

J. B. MEDLAND says: "Mr. T. N. Armstrong, in his article, *A Few Essentials*, &c., says, on page 538 of the number of your JOURNAL for Aug. 23, that he backed the plates with bitumen and chloroform as described in a previous article. I have searched back to the beginning of March, and cannot find anything respecting the backing of plates, nor an article of his. Will you kindly say what is the date of the JOURNAL in which it appeared?"—We are unable to trace the reference. Perhaps Mr. Armstrong will give the date.

ERNEST BROWN writes as follows: "In last week's JOURNAL you published the particulars of a patented heliographic process. I just want to mention I have a process of that name, although entirely different in working, &c. What I would like to know is, if Mr. Lake, having patented his process, can hinder me using that name?"—No, certainly not. It is a generic term that has been in use since the earliest days of photography. The patentee can, of course, no more claim the word than you or any one else can.

A. G. S. asks: "Would you kindly answer the following question? I intend purchasing a portrait lens working at about *f*-3 or *f*-4, out of doors, animal studies. 1. Could I, with an aperture of, say, *f*-8, obtain the same results as with a rapid rectilinear lens working at *f*-8? 2. Would it render distances at all? 3. Would it cause flare spots?"—1. Yes, practically the same. 2. The same as with a rectilinear of the same focus. 3. A portrait lens is more prone to give a flare spot than is a rectilinear.

F. HUGHES writes: "I have a studio on repairing lease, and above this is an office belonging to the landlord, which had some loose cement attached to the window, and has now fallen down on the studio and broken three windows. I wish to ask you who should replace them, myself or landlord, as he has refused to have anything to do with it?"—If the landlord will not repair the windows, we expect you will have to do so. If you had given him notice that his cement was in a dangerous condition, the case might have been different. However, three squares of glass are not worth a lawsuit.

LANGFIER & CO. say:—"We shall esteem it a favour if you will kindly let us know what you consider the best method of taking a film off a negative. The negative has been broken, but the film is intact, and we should like to keep it so."—Immerse the negative in water, to which a few drops per ounce of hydrofluoric acid has been added. In a few minutes the film will be loosened, and can be floated on to another plate. If the film expands, its immersion in alcohol will bring it back to its original size. Of course, if the negative has been varnished, the varnish must be removed before operations are commenced.

J. C. P. says: "Could you kindly tell me the cause of the yellow colour on the enclosed print, as I get a batch of prints now and again touched more or less in the same way? Also could you tell me any way of mounting backed P.O.P. prints without marking all round the edges, as I find them do when mounting with glue or gelatine?"—As nothing is said as to the method by which the prints were produced, we can say nothing definite. They look as if they were toned in a "combined bath," and that the toning was more due to sulphur than to gold. The backing paper should be thicker and less absorbent than on the prints sent.

MANCASTRIAN.—Take a lump of newly burned quicklime and slake it with water. Dissolve the carbonate of soda in half the quantity of water required in your formula, and pour the hot solution on the slaked lime and stir or shake the whole well together, and make up the bulk to full quantity with more boiling water. Set aside to settle, and decant the clear portion. This will contain a minute quantity of lime—less than one grain to the ounce—in solution, but this will not in the least affect the developing power. The quantity of lime to use will be, if pure and fresh, one-quarter the weight of the carbonate of soda if in crystals, or one-half the weight if anhydrous. To ensure the lime being "quick," a lump may be folded in a piece of thin sheet iron or tin, and raised to a red heat in an ordinary fire; but you must bear in mind that, by rendering the alkali caustic, the developing power is vastly increased, and also that it is imperative that some restraining bromide be used.

DIAGRAMMATIC LANTERN SLIDES.—Answering a correspondent of *The English Mechanic*, Mr. W. I. Chadwick writes: "You can draw or sketch a diagram on a plate coated with black varnish, which will show white lines on a black ground. Use a sharp steel point for sketching or drawing; but, of course, this won't do if you want to trace a diagram from a book. The best of all methods is to get a box of photographic lantern plates, open these in daylight, and immerse in an ordinary fixing solution (hypo 1 to water 4). This will remove all the silver, and after washing the plates they are as clear as clear glass, with a fine even surface of gelatine on one side when dry; they can be sketched upon with an ordinary pen, or a drawing pen may be used. Indian ink, crimson lake, or prussian blue may be used, and the drawing or diagram is now on a white ground. If it must be on a black ground, then expose a lantern plate in contact and develop it as for a lantern slide. We have then white lines on dark ground. Strips of thin coloured gelatine may be fixed over certain lines to give colours to certain lines—for instance, 'centre lines,' &c."

CONTENTS.

	Page
BINARY PICTURES	561
GOLD IN PHOTOGRAPHY	562
MOUNTING PRINTS OF LARGE DIMENSIONS	562
SOME REMARKS ON PLATINOTYPE PRINTING. By VALENTINE BLANCHARD	564
PHOTO-CHEMICAL NOTES. By G. E. BROWN, A.I.C.	565
WEATHER FALLACIES	566
THE FUTURE OF PROCESS ENGRAVING	569
TESTS FOR SODIUM THIOSULPHATE. By MATTHEW WILSON	570
THE CITY AND GUILDS INSTITUTE EXAMINATION IN PHOTOGRAPHY	570
THE COMBINATION OF NATURAL AND ARTIFICIAL LIGHT	571
HALF-TONE ENGRAVINGS BY THE ENAMEL PROCESS. By ROBERT WHITTET	572
OUR EDITORIAL TABLE	573
NEWS AND NOTES	573
FORTHCOMING EXHIBITIONS	574
RECENT PATENTS	574
MEETINGS OF SOCIETIES	575
CORRESPONDENCE	575
ANSWERS TO CORRESPONDENTS	575

THE BRITISH
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OUR FORTHCOMING ALMANAC.

The Almanac for 1896 being now in course of preparation, we take this opportunity of inviting our friends to contribute to its pages short practical articles descriptive of their recent experiences and experiments in photography. The popularity and value of the Almanac have always been largely due to the inclusion in its pages of many contributions from photographers of great ability and knowledge, a feature in which we cordially invite the co-operation of our readers in all parts of the world.

We shall also be glad if intending contributors will let us have their articles, sketches, &c., at as early a date as possible, so that the risk of their having to be omitted through lateness of arrival may be obviated.

Secretaries of Societies, and especially of those founded during the year, if they have not already done so, will oblige by at once forwarding lists of officers for inclusion in the directory of photographic Societies, so that this section of the Almanac may be made as complete as possible.

GARDEN AND GREENHOUSE PORTRAITURE.

It is, we think, pretty safe to assert that, out of every one hundred possessors of a camera, not half a dozen have, or even have access to, a studio in which to indulge their desire to take the portrait of a friend. Under such circumstances nothing is left for the amateur but to utilise his garden, and truly hideous are *some* of the portraits that are thus obtained. The light pours in upon the sitter from every direction, and every one knows what havoc, artistically, cross lighting makes of the face. Of delicate modelling there is none, and the face is represented as flat as the proverbial pancake.

Happy is the one who can find a sheltered corner, in which, by the aid of friendly trees or other expedients, the light can be so shut out as to leave one dominant light that will ensure a properly lighted portrait to be eventually secured.

We have known a skilful portraitist, who desired to take a portrait of a local celebrity, who had to be posed in a garden under the extreme of adverse circumstances, after giving a blank look at his surroundings, immediately setting himself to having them reconstructed by the aid of a tall clothes-horse, on which he suspended such dark-coloured fabrics as he could lay hands on, and by which one side of the sitter's face was thrown in some degree of shadow, assisted by a few boards appropriated from a neighbouring garden, produce a beautifully rounded, well-modelled face, the top light being modified by an opened umbrella being held over the sitter's head. The negative, when examined by expert friends, was declared to be a masterpiece so far as regarded the figure. When we saw the finished print, after having undergone treatment at the hands of a clever and somewhat unscrupulous retoucher, it represented the gentleman seated in his library with bookshelves in the background and ponderous tomes on the table. But it requires a really talented portrait artist to enact a scene of this character.

It is well known that, when that master of pose and expression, O. G Rejlander, visited Edinburgh for the purpose of taking certain portraits, some years before his death, he had to take these sitters under conditions well-nigh similar to what we have just described. Notwithstanding these disadvantages, he managed to produce portraits which were eulogised by contemporary local photographic artists of eminence, such as the late James Ross and John Moffat, who were loud in expressing their admiration of the genius of their brother—if for the time he was their rival—artist.

To return to the garden. Granted the sheltered corner already spoken of, and in which the lighting is found to prove all that is desired, there is still an all-powerful influence of an adverse nature that seems invariably ready to make itself felt just when it is not wanted. We refer to the wind. Imagine the annoyance it must prove to all concerned when some lady friends, taking advantage of the amateur's Saturday half-holiday, come by invitation to present themselves before their friend's camera! The light is good and all that can be desired; but the wind is strong, and blows about the curls, ribbons, and belongings of a well-dressed female.

This was our case the other day, and we felt chagrined at having to confess to the impossibility of getting a picture on that occasion. But the problem was solved by the agency of a partially used greenhouse, twenty-three feet long by seven feet in width, with a lean-to roof, all except the back being glazed, the front to within three feet of the ground. The height above the floor is sufficient to permit of a tall man standing erect at its lowest part, while the roof rises to ten feet at the back. By the time the lady friends made their return visit, the greenhouse had been converted into a passably good studio. At one end had been erected a plain background on rollers, while the direct rays of the sun were debarred access by means of blinds along the roof, one of these, imme

diately over the sitter's head, being black. A black screen and a white one, each portable and mounted on a stand, complete the appliances for controlling the light. These are made so as to slide up and down, so as to produce the best effect.

We give these details as a suggestion to those who may be similarly situated when they wish to vary their practice, usually landscapes, with an occasional turn at portraiture.

FOREIGN AND BRITISH PHOTOGRAVURE.

In recent issues attention was directed to the present state of some of the photo-mechanical processes, from a commercial point of view and quite apart from their technical aspects. There is, however, another process that perhaps, above all others, calls for comment, namely, the existing state of photogravure in this country. Whenever one sees a fine photogravure, the imprint upon it almost invariably shows that it was produced either in France or Germany. Even if the imprint is not there, it may fairly be assumed that the plate was made in one or other of those countries, as a large number of plates are made abroad, though they are printed here.

It is a lamentable fact that hundreds of pounds' worth of work goes every week to the Continent for execution which one would think ought to be done here. There is, doubtless, good reason for this, and it is certainly desirable to inquire as to what it is, for it is manifest that publishers would not be at the trouble and risk of sending valuable pictures, worth perhaps thousands of pounds each, abroad for reproduction, to say nothing of the time that, as a rule, the foreign houses take for the execution of orders, if they could get the same thing as advantageously done at home. Cheapness is usually accredited as the reason why so much work comes from abroad; but this certainly does not apply to photogravure, for the prices charged for plates by those foreign houses which send the most work here are far higher than those charged by the photo-engravers of this country. Taking these and other facts into consideration, we can only come to the unpleasant conclusion, that the foreign work is more satisfactory to those for whom it is done than is that of home production.

The Society of Arts, fully realising that, and with the laudable desire to stimulate British work in this direction, a little while ago offered a substantial prize for the best photogravure plate. This brought together a goodly number of competitors, and the winning plate, and the next best, were highly creditable productions as untouched plates, and untouched plates were a stipulation. The competition was an interesting one, but we cannot help thinking that it would have been still more so in a commercial sense if the competitors had been allowed to show, as well as a print from the untouched plate, another after it had been worked up by hand, so that the results might have been the better compared with the photogravures produced on the Continent. They are not from untouched plates, and many of them have been worked upon, perhaps for weeks, by the most skilful engravers.

Some years ago, in a paper at a Camera Club conference, Mr. Alfred Dawson strongly commented upon the limits of photogravure; but, if its scope is as limited as stated, then there is certainly no reason why the work should not be supplemented by the engraver, and that is just what the Continental workers do to an unlimited extent if found necessary to get the finest results. English workers of photogravure, for the most part, seem to look at the results from a photographer's standpoint. The French and German workers, on the contrary, look at them from an engraver's point of view, and they are right. Photogravures are not to compete with photographs, but with line or mezzotint engravings, which they are to take the place of, and the closer they can be made to resemble them, and the less they are like photographs, the better they will please the artists who painted the originals, the publishers, and last, though not least, the purchasing public. That is what the foreign houses aim at supplying. If the scale of tints, as rendered by photography, is shorter than it is in the original, then by all means let us have it extended by the scraper, roulette, or burin, and that is what the foreign houses give us. By that means they have, up till now, held the market against the home producers, who hitherto seem to have been, to too great an extent, sticklers for untouched plates.

Although so much hand work is generally expended on the foreign plates, it must not be assumed that the photographic work is not of the highest order in the first instance, for it is. No skill or trouble is spared to obtain the best possible result to begin with, as, of course, the better the plate is, the less will be the costly labour it will require afterwards. Many who have taken up photogravure have been photographers who have not known the requirements of an engraved plate. Others have been engravers who were not really photographers. The latter have generally been the more successful of the two. Amongst the most successful workers of photogravure in this country are those who were originally engravers. The winner of the Society of Arts' prize, and also the one whose work was "highly commended," are, we are told, both engravers who have learnt photography only to work photogravure.

Line engraving and mezzotint engraving are now practically extinct. The old hands have died out, and no young ones have been brought up to take their places. Still it must be admitted that the finest photogravures are not equal, at present, to a fine line or a mezzotint engraving, though some recent German work we have seen is running the latter very closely indeed; but it was not pure photography, and, what is more, the producers of it make no pretension that it is. Publishers, as representing the purchasing public, want the most saleable prints, and they care not how they are produced. They would prefer hand engraving altogether if they could get it, but, failing that, they obtain the nearest they can get to it in effect.

This, like some previous articles, is written in a strictly commercial spirit, for it is really grievous to see so much really profitable work going out of the country every day to flourishing houses abroad.

RENDERING THE CARBONATES CAUSTIC FOR DEVELOPMENT.

In replying to a correspondent last week we were struck by the possibility that, in making a suggestion on the above subject a few weeks back, we might perhaps be instrumental to some extent in misleading the less thoughtful of our readers, although at the time we gave the necessary warning. It may therefore be well if we append a few additional remarks with a view of making the matter perfectly clear.

At the close of an article on the use of the carbonates in development, on page 516 of our issue for August 16, we suggested that those who prefer to use sodium carbonate on account of its undoubted convenience might overcome one of the difficulties in its use pointed out in that article by rendering it

caustic by means of calcic hydrate, a substance very easily available almost anywhere, at the same time qualifying the advice by the reminder that that course would entail a complete "overhaul and alteration of the formula." From the tone of our correspondent "Mancastrian's" communication, we rather judge that he is, or was, under the impression that the change from the carbonated to the caustic condition would have no effect upon the developing value of the soda contained in the formula he is in the habit of using; but, that this is far from being the case, we shall show, not only from a practical but also from a theoretical point of view.

We may, first of all, quote actual experiments made with the formula published with one of the leading brands of commercial plates, containing sixty grains of sodium carbonate (crystals) in each ounce of water, to be mixed with an equal volume of "stock" pyro solution for actual use, and representing therefore thirty grains of the carbonate in each ounce of developer. A solution of the carbonate—ordinary washing soda, of the strength first mentioned—was made and treated with calcic hydrate in the manner shortly to be described more fully, in order to eliminate the carbonic acid and convert it into caustic soda. The precipitate of carbonate of lime was allowed to settle, and the clear liquid was decanted, and made up with sulphite of soda and water to the proper volume for use in the formula mentioned, and then constituted a solution of sodium hydrate containing precisely the same quantity of soda as the original carbonate formula.

A plate was exposed to an open view, with the lens at *f*·22, the time, with a slow shutter, being about one tenth of a second. This test was applied rather from curiosity than with any expectation of getting a printable negative, and a second plate was exposed at the same time, and under like conditions, for comparison, under treatment with the unaltered solution. This turned out a good negative, lacking perhaps a little in the strength of the detail in the deepest shadows. Upon applying the modified solution, mixed in equal proportions with the pyro "stock," the image flashed up instantaneously, and was, in fact, lost to view at one end of the plate before the other was covered with the developer. The result was not evidently merely fog, but chiefly excessive over-energy, as the details of the picture were momentarily visible, but rapidly disappeared from the nearly simultaneous development of the deepest shadows, followed by general veil. It should be observed that no restraining bromide was employed with either plate, which proves the vast power in that direction exercised by the carbonic acid.

Another exposure was made, and this time the proportion of alkali used was reduced to one-half, and an addition of one grain of potassium bromide was made to each ounce of developer. Even with this weakened and restrained developer, the result was scarcely altered. The picture remained visible by reflected light for a few seconds, but soon passed into general veil as in the previous case, the film presenting so little contrast that, in the red light of the developing room, it was quite impossible to distinguish any trace of an image. The plate was washed and fixed, when a very faint flat image, perfect in all its details, but utterly useless for any purpose, was left.

Gradually reducing the quantity of alkali, we succeeded at last with only one-eighth of the original quantity, and, using the same proportion of bromide of potassium—one grain to the ounce—in obtaining a passable and printable negative; but, in comparison with the one developed with carbonate, it had the appearance of being flat and over-exposed. In spite of the great reduction in the quantity of alkali, and the presence of a tolerably strong dose of restrainer, the development was still much more rapid than with carbonate, and suggested that, although the strength had been lowered as far as was desirable with any hope of getting vigour, still there was need for a freer use of the restrainer.

As an after-thought, a final exposure was made, substituting an equivalent of ammonia for the calculated quantity of sodium hydrate present; but, as this was much below the quantity recommended in the pyro-ammonia formula issued by the makers of the plate, we were not surprised to find the result little better, so far as vigour was concerned, than that obtained with soda.

In accounting for this result of the modification of the carbonate formula, we need, in the first place, only point out that in rendering the alkali caustic two atoms of soda are set free, with absolutely no restrainer to hold in check the excessive energy; whereas, in the case of the carbonate, one of those atoms is completely neutralised by the carbonic acid, and, if the other is considered to be in the free or active state, it is modified in its action by the presence of the acid carbonate which has been claimed, and which the experiments we have detailed prove, to be a strong restrainer. How strong, in fact, is to be judged by the comparative behaviour of the normal carbonate solution and of the modified solution at one-eighth the strength with the addition of a full proportion of restraining bromide.

Although caustic ammonia is the oldest, and with many still the favourite, form of alkali for use with pyro, the caustic-fixed alkalies have never been much used with that reducing agent, although their carbonates are so employed every day. With other of the newer reducers, and especially with hydroquinone, caustic soda and potash have long been used, and, in fact, form the best combination with the last-named developing agent, which is extremely slow when employed with carbonate. The difference in behaviour is, no doubt, due to the circumstance that hydroquinone, metol, para-amido-phenol, and glycin stand less in need of restrainers of any kind than does pyro, and, if the proper equivalent in restraining power of bromide as compared with carbonic acid can be ascertained, no doubt the hydrates of soda and potash would behave as well with pyro as ammonia, and be free from the objection of volatility that attaches to the latter.

But, in estimating the comparative restraining values of the two agents, we are met with the difficulty of the altogether different conditions that exist in the use of the caustic alkalies and the carbonates respectively. The former are intensely energetic in their uncurbed condition, and, in checking them with bromide or by combination with carbonic acid, we are applying two essentially different forces. The action of bromide is chiefly to *retard* development, and so give time for the high lights and gradations to acquire density before the shadows are fogged. In applying bromide in conjunction with the caustic alkalies, and especially in cases of over-exposure, we have, in proportion to the quantity used, a stoppage of developing action up to a certain point, after which, when the image begins to appear, it proceeds with comparative rapidity through all its stages, unless further additions of the restrainer be made.

In using, instead of bromide, carbonic acid the action is different. A portion of the alkali is neutralised, which, of course, converts the solution into a milder form, and a re-

strainer in the shape of the carbonate, or rather bicarbonate so formed, is applied at the same time, so that we have a development that proceeds from the outset with greater regularity and uniformity, and without the sudden rush that takes place with caustic solution when the temporary retarding effect of the bromide is overcome.

Our view of the possible utility of the caustic alkalies is that they should prove valuable in all cases of extremely rapid exposure, owing to their energy in bringing out obscure detail, but that before they can be considered really under command the use of bromide as a restrainer will have to be supplemented by that of a bicarbonate as proposed some years ago by a member of one of the Scottish societies. In fact, the developer will have to be treated in such a manner as to convert a portion of the alkaline hydrate into normal carbonate, in which condition it acts in a milder manner without being robbed of its developing power. The action of bicarbonate when used in this manner would be rather that of a restrainer in the strictest sense than of a mere retarder as in the case of bromide.

Those who desire to experiment in this direction can easily do so by following the instructions given to "Mancastrian" last week. Sodium hydrate is not readily obtainable at all chemists, and when obtained is not invariably beyond suspicion of being principally carbonate. In order to obtain it in definite form and strength, it is only necessary to dissolve 286 parts of washing soda in a small quantity of boiling water and mix this solution with an excess of freshly slaked lime. After some little time the clear liquid is poured off, and the sediment shaken up with a fresh quantity of hot water and again allowed to settle, the clear liquid being added to the first. This can be made up to any required volume, bearing in mind that 286 parts of the carbonate represent eighty of the hydrate.

JOTTINGS.

I VENTURE to remind my readers that the Exhibition of the Royal Photographic Society opens at No. 5A, Pall Mall East, on Monday, September 30. Exhibits will be received at that address on Tuesday, September 17, or up to September 14 at the Society's Rooms, No. 12, Hanover-square. On Saturday morning, September 28, a private view, quite in the ambitious and high-toned style of the picture galleries, will be held, and in the evening the usual *conversazione*, so beloved of many London and country photographers, will take place. Certain superior members of the Society are suspected of a desire to abolish this old-fashioned but thoroughly enjoyable function, the past success of which should, and it is to be hoped will, guard it from the meddlesome interference of these restless busybodies.

I would urge all those of my professional friends who have the opportunity of doing so to submit specimens of their work for exhibition at Pall Mall. In the past that Exhibition has undoubtedly been esteemed as the classic field on which the best professional work has been submitted to friendly rivalry and criticism, and it is the bare fact that some of the foremost professional photographers that we now have first earned name and fame in the historic Gallery at Pall Mall. To be "hung" there is an honour, to be medalled is a distinction, but, above all, the opportunity of publicly comparing and having one's efforts compared with those of other workers, is a source of profit and instruction which, in these times, a professional man would be wise to court.

A fortnight ago I drew attention to the advertisement of a Society which, on its own showing, simply existed for the purpose of gratuitously distributing photographic apparatus among aspiring novices. A lady, who dates from a remote part of Cornwall, sends the following question in reference to the matter:—"Seeing in your JOURNAL a fortnight back the generous offer of the 'Society for the Promotion of Photography' in giving away cameras complete to novices, I wrote to ask if it were really genuine, and if I were eligible, but have had my letter returned, with the words, 'Gone away' written outside the envelope, and should be glad if you could tell me where they are to be found, and if it is a genuine offer."

I do not know where the precious Society has moved to, and I should hope it is not necessary to say whether its offer was genuine or not. The peculiar nature of the whole business is apparent. The "Society" leads a wandering existence, and bobs up serenely in various parts of London from time to time. As the *Skibbereen Eagle* is alleged to have told a former Czar of Russia, I am "keeping an eye" on the Society, and I beg others to do the same.

Another correspondent also makes reference to one of those schemes which are rapidly getting photography an unsavoury reputation as a ready and obvious vehicle for the exploitation of all sorts of frauds and swindles. Says this gentleman, who writes from the south of London: "I beg to enclose an advertisement for 1000 babies to be photographed free of charge. This affair is worked much about the same as the free-photograph business, whose principals were prosecuted a year or more ago. This man says he will give to every mother who applies one large photograph of her baby; but I find that, when a mother applies to have her baby's photograph taken, he will not take it until she pays him the sum of 2*s.* 9*d.* for a frame to put the photograph in. Will they allow a man like this one to exhibit in the International Photographic Exhibition?"

Following my usual custom, I reproduce, with the omission of the name and address, the circular of this latest would-be "benefactor."

"1000 babies wanted!

"Monsieur ———, having decided to exhibit in the next International Photographic Exhibition his new instantaneous process for photographing children, offers to every mother one large portrait of her baby, size ten inches by eight inches, free of charge! The portrait will be beautifully finished in artistic and attractive style, ready to be framed.

"Please carefully read the following instructions:—

"1. Mothers only must call at the studios and obtain the *free* form, which is to be carefully filled up, and appointment made for time of sitting.

"2. Babies in short clothes, from six months to three and a half years, *healthy* and *fresh-looking*.

"3. Colour of dress should be cream, blue, or rose, trimmed with ribbon and lace, or, if in chemise, a fine embroidered muslin.

"4. Mothers wishing to obtain this free photograph must apply for the free form *at once*, as under no circumstances whatever will any be issued after the 15th September, 1895.

"Notice.—It is intended to select the nicest babies to make a baby show and competition of beauty, of which further notice will be given.

"Three prizes — (1) Gold medal; (2) silver medal; (3) oil portrait, natural size, in frame—will be distributed after the show.

"Competent judge and jury.

"In any case where the reader of this advertisement has no children, it is requested it be handed to relations or friends.

"No charge whatever will be made.

"Please cut out this advertisement and bring with you."

The expressed "decision" of Monsieur ——— to exhibit in the "next International Photographic Exhibition his new instantaneous process for photographing children" will, it is to be hoped, not be frustrated by any untoward attentions on the part of those who may not sympathise with the way in which he conducts his business, to which a London evening newspaper, of last week, applied a very ugly name, that, if correct, should assure Monsieur ——— an early interview with a magistrate.

Politics to a non-partisan, such as I myself prefer to be, often appear to be neither more nor less than a game of lying, in which the side that for the time being manages to lie more to the taste of the majority of the electorate secures that much-coveted side of the House of Commons which is to the right hand of the Speaker. Government by party essentially hinges upon the maintenance of the dual tradition that, according to the Tories, nothing good can come out of Liberalism, while Liberals are unable, or, at any rate, will not, see anything but what is bad in Toryism. Even on questions of fact, with which political strife can have little or no concern, the same subjection to party exigencies of truth or falsehood is perpetuated with a conscientiousness and determination such as is possibly unknown in non-political life.

That this view of the central principle upon which political warfare is conducted is not exaggerated may appear plain from an incident of which Dublin was recently the theatre. When the new Lord Lieutenant, Earl Cadogan, made his State entry into the Irish capital, the Unionist press described his public reception as unprecedentedly enthusiastic. The Home Rule organs, on the other hand, alleged that his Excellency had a chilly greeting. Fortunately, photography, if it does not enable us to positively declare whether or not the Dublin populace was demonstrative or cold on the occasion in question, at least places the English reader in the position of being able to judge between the conflicting reports of rival newspapers. In *Black and White* of a fortnight ago there is a reproduction of a photograph, by Messrs. Werner, of the Vice-regal procession passing by Kildare-street through two fringes of spectators, not more numerous than you could find in the Strand at almost any hour of the day. Two hats are raised; one is the Lord-Lieutenant's, the other belongs to a spectator; and the appearance of the crowd is such as to suggest to me that it was animated neither by enthusiasm nor hostility, but that it was engaged in giving a polite and utterly unemotional greeting to a newly appointed official, at whom there was some curiosity to have an idle stare. But I may be wrong, for, as I said before, I am no political partisan.

"Proof-faking" is a term that must be of peculiar interest at this moment, when the shortcomings of the half-tone process are undergoing such general examination and discussion. When blocks are delivered to an editor or publisher, it is the custom of the etcher also to submit proofs, and these it is needless to remark are usually of a nature calculated to show off the qualities of the *cliché* to the best advantage. I am informed by a friend, who is himself a photographic etcher, that the pulling of these proofs is by some etchers so artistically done as to deceive all but practical men as to the actual printing qualities of the block, which therefore may or may not be what is required. Hence the term "proof-faking" employed by my informant as a term of reproach against one or two excessively "smart" etchers whom he named.

My grocer is just now exhibiting outside his shop a large frame containing a dozen 12 × 10 prints from half-tone phototypes of familiar London and country scenes. He tells me that with each pound of tea I in future purchase of him he will hand me a coupon to a small value, and when I have accumulated a certain number of these precious vouchers I shall be entitled to an album of "beautiful views." I prefer to buy the album right out in the ordinary way instead of paying eighteenpence a pound for sixteenpenny tea, which is how my grocer—good man—no doubt proposes to recoup himself for his outlay. At this rate of progression downwards, how long will it be before phototypes follow oleographs into oblivion?

Hearth and Home, a delightful lady's journal, rejoices over the circumstance that, instead of there being only one lady photographer in London, there are two, viz., Miss Alice Hughes and Miss Kate Pragnell. My contemporary goes on to remark that both ladies are "sincerely to be congratulated on their success in a profession which seems peculiarly suited to women, and which surprisingly few of the fair sex have made their own." May I remark, in reply to this, that, to my knowledge, the number of lady photographers in London in business for themselves considerably exceeds two? As to the lament that so few of the fair sex have adopted photography as a profession, I would remind *Hearth and Home* that probably thousands of women find employment in photography as retouchers, printers, spotters, reception-room attendants, operators, &c., and that the number of married women who assist their husbands in their businesses is also very large. Again, in many of the photographic manufacturing establishments, numerous women and girls are also engaged, so that, on the whole, photography compares favourably with other professions in the facilities it gives women for finding occupation.

By nature I am a mild and peaceful being, whose chief delight it is to live in amity and cordiality with all men. My neighbours point to me as a Vessel of Sweetness and Light, and, whenever I pass through the thoroughfares that lie contiguous to my humble abode, I am half conscious of having a blessed and hosanna-marked reception such as that which the white-headed patriarch of *Little Dorrit* was in the habit of encountering in his occasional journeys through the slums and courts, the tenants whereof it was the dismal mission in life of lovable old Mr. Panks "to squeeze." It is only in these pages that I unwillingly collide with my fellow-men, and make enemies of them against my inclination and my principles.

I was flattering myself that the days of my differences with "The Shoptician," with "Zoilus," with Mr. Hector Maclean, with the "Linked Ring" and its apologists, and with many other foes, were all passed and done for, and that for the future I could look forward to a bland and unimpeded path of usefulness to my innumerable readers, when, lo! there falls across that path the dark shadow of one, "Ignotus," who, in the pages of our venerable contemporary, the *Photographic News*, appears to be deliberately courting castigation. In a recent number of that journal he indulges in a variety of veiled attacks on several individuals, who, no doubt, will square accounts with him in due course, and manifestly shows that he holds a brief for the "Linked Ring" and the Camera Club. I do not know who deserves the greater pity, clients or advocate. But the worst sin of which he is guilty is the attempt to sow the seeds of discord among the members of the Royal Photographic Society by trying, at this early date, to discount the result of the next election to the Presidency of that body. A more deplorable indiscretion could not have been committed.

COSMOS.

MECHANICAL AIDS IN PRINT-WASHING.

A good deal has been written lately on the importance of thorough and rapid washing in the case of gelatino-chloride prints, but little advance has been suggested in the methods of arriving at the desired end. A constantly changing flow of running water is, of course, theoretically a perfect way out of the difficulty, but it is easier to talk and write about than to put into practice even when an abundant supply of water is laid on at the main; but, when, as in numberless cases like my own, the water has to be pumped up as required, the constant stream becomes a matter of practical impossibility. Besides, this, although the regular flow of water may be kept up, some other means must be adopted of keeping the prints in motion, or of preventing their settling together in a mass in such a manner that the removal of the soluble salts becomes a matter of very great uncertainty.

The plan generally recommended, and which I have until recently followed, of changing the prints singly from one dish of fresh water to another, is, no doubt, perfectly efficacious so far as it goes; but it cannot be denied that it involves a serious amount of trouble, and, when more than a very few prints are concerned, it gives rise to a strong tendency to more or less shirk the work. The mere time occupied in changing eight or a dozen times so moderate a number of prints as a couple of dozen is very considerable, and still the difficulty remains of keeping them freely exposed to the full action of the water during the periods they are soaking. So far as my experience goes with the various automatic washing machines, many of which

are very ingenious in construction and perfect in action, is that they are scarcely adapted for use with gelatine paper, especially when large numbers of prints are treated, owing to the danger of injury from the friction of the surfaces against one another, and from particles of solid matter in the water itself.

Provided the gelatine surface can be kept freely exposed to the washing action of the water, the necessity for keeping the prints in motion disappears, for the removal of the soluble matters by diffusion will then proceed with all desirable rapidity, and all that is needful is to change the water at intervals, the more frequently the better, and an apparatus that provides for this without entailing an excessive amount of trouble, or occupying a great deal of space, appears to me to be in every way desirable. I have been experimenting in that direction with the most gratifying results, and a brief outline of the method adopted, which is simplicity itself, and within the scope of the humblest mechanic to get up for himself, will, I feel sure, prove acceptable to many readers of the JOURNAL.

The primary idea, I took from an apparatus introduced some years ago for the same purpose, but which was so absurdly cumbersome in its construction and mode of working, and, at the same time, involved an amount of trouble altogether disproportionate to the results that I never heard of the thing being actually used. In this, each print was confined in a separate cell, a system perfect in theory, and only failed in practice owing to the cumbrous manner in which it was carried out. The cells consisted of separate wooden frames about half an inch thick, glazed so as to form a series of glass-bottomed dishes; these were clamped together radially round a revolving axle placed in bearings in the side of a zinc-lined trough, passages being cut in the frames so that the water had access to their interiors when clamped together for use. The prints being placed in the trays, the whole were fixed in position, the spindle, which was fitted with a crank handle, placed in its bearings in the trough, which was partly filled with water, a cover placed over it in the vain attempt to prevent splashing, and the machine set in motion like a barrel organ, for such period as might be deemed requisite to produce the desire result. The apparatus as described, for, I think, eighteen prints 5 × 4, occupied the space of a one hundred-weight cube sugar-box, and, when set in motion, converted an ordinary-sized room into a sort of dismal swamp in a far less time than it could be expected to take in properly washing the prints. So far as the latter duty was concerned, I never tested it; but, as an efficient method of combining gentle exercise with setting the washing water in violent motion, I dare recommend it as fully equalling a barrel churn.

I am afraid this description will frighten my readers, but it need not do so, as the only feature I have retained is the separate cells, and, as I employ them, they may be easily constructed by any one; they may be of the roughest description, or, if preferred, may be finished with any degree of elaboration. I will describe my own plan, simply pointing out that the dimensions named may be altered at will.

In the first place, I construct a frame of three-eighth-inch wood resembling the body of a box without bottom or lid, and having an internal measurement of fifteen inches square; this is slit up with the circular saw into trays a quarter or three-eighths of an inch deep. If preferred, the trays may, of course, be made separately, but this is simply a matter of detail, depending upon the facilities available in the way of tools and workmanship.

The trays are provided with bottoms composed of cap muslin or coarse canvas. Mine consist of "paperhangers' canvas," a coarse, open material used for laying paper over uneven walls. This is stretched lightly over one side of the tray, and fixed with small tacks or "gimp pins." The trays are further subdivided, each into six partitions of thin wood, sawed out of Venetian blind laths, the inner frame being made removable so that the same trays may be used, when necessary, for prints up to 15 × 12. With the inner frame in position, each tray will carry half a dozen half-plate or cabinet prints in separate compartments, and may be adapted also for other sizes if such be worked. Six of these trays, capable of holding three dozen prints, form a block less than three inches thick, and should be provided with catches, or some arrangement for fixing the whole or any part of them moderately firmly together.

The only other necessary is a dish or other vessel large enough to take the block of trays, and this I construct of common one-inch deal flooring boards, tongued and grooved at all the joints and fitted together with screws. When well soaked in water, it will be found perfectly water-tight. The depth is that of the width of the flooring board, about six inches.

Now, it is obvious that, when the prints are laid in these cells, they are separated from one another by the canvas partitions, and cannot therefore cling together, and, though one surface may be in contact with the partition, there is a space of at least a quarter of an inch for the free access of water when the block of trays is immersed in water. It is also obvious that the water has free passage in and out of the block, through and amongst the prints, and that the very act of plunging the block into, or taking it out of, the water sets up a powerful current over the exposed surfaces of all the prints, and that therefore, with a very little exertion, a most perfect, and even violent, washing can be given without the least danger of friction or tearing. The partitions effectually prevent the prints floating one on to the other, and the narrow space between the canvas bottoms renders it practically impossible to get the prints doubled or creased.

In using this, the prints, after fixing, are passed through one or two changes of water to remove the bulk of the hypo, and are then laid one by one in the cells, and as many frames as may be filled in and fastened or clamped together and plunged to the bottom of the washing trough. The block will float, so some means must be taken to keep it immersed. I simply place a weight on the top of it. The simple lifting up and down of one end of the block at intervals sets the water in motion over the whole surface of the prints, which may thus be very thoroughly washed in the shortest possible time. Further than this, after the prints are once transferred to the cells, the one motion of lifting the block removes the whole at once, and thus the tedious changing one by one is entirely obviated, and the last excuse for neglecting the work is removed.

I find that, after half an hour's washing in six or eight changes of water, in this arrangement no appreciable traces of hypo are discoverable by ordinary tests; but, if it is desired to be quite safe, an hour will surely remove all danger. I use the same trays for washing after the alum bath, thorough washing at that stage being, I consider, quite as needful to permanence as after the hypo.

I think any of my readers who try this plan will find the advantage of it, and it may be as beneficially used for small as for large numbers.

W. B. BOLTON.

THE COMING EXHIBITIONS.

THE elect of business photographers and the gifted among amateurs are now busy selecting their best work of the year for public appreciation. Both the Royal Society and the Salon, says Mr. W. S. Bird in *Autotype Notes*, open their doors on the same day (September 30), the former remaining open till November 14—nearly a fortnight later than the Dudley Gallery.

Any surprising development of photographic art and practice is scarcely to be expected; there will probably be a greater sobriety of treatment at the Dudley, and a higher level of both technical and artistic merit at the Royal. The first can be achieved by mere repression of eccentricities; the second may be anticipated from the great increase of membership and general activity of the Society.

It would be absurd to suppose that the gentlemen of the "Linked Ring" generally approve the wilder examples that give a comic element to the Salon; but, in face of new enthusiasm in the direction of artistic photography, it may be judicious to allow considerable licence to its more ardent and fantastic devotees. Observers free from prejudice can at least be amused at the Salon by eccentric efforts, which, at their worst, teach what it is best to avoid. From the beginning there has been a large amount of beautiful work to admire, bearing the stamp of artistic feeling and of adequate performance. These qualities, cultivated by study and observation, engender originality, and, for its encouragement, Exhibitions have been invented, whose aim is also to educate the public—upon the whole, a very blind public, much needing enlightenment.

This general blindness to æsthetic impressions was impressed on me recently by looking through some 250 views, whole-plate size, representing the scenery, marine and landscape, round about Whitby, with

admirable examples of the lads, fishermen, and labourers of that interesting district. There was not a single print of the series that did not, in my opinion, bear the impress of a distinct personality, sensitive to the beauty and interest of nature, keenly alive to the harmonious intermingling of the life element, and capable of those delicate adjustments which convert correct representation into pictorial presentment. Nevertheless, the author (whose name needs no mention) informed me the series were essentially "pot-boilers;" and, although duly supplied to dealers, their fine quality was but rarely appreciated by the public.

The great use of Exhibitions is to educate this undiscerning public to some perception of the æsthetic element present in high-class photography, to open the eyes of the blind to the charm of artistic impression accomplished without sacrifice of veracity.

As to the R.P.S. Exhibition, a finer display than usual may be anticipated, from the great increase of its membership and the widening interest of educated persons in knowledge of photographic procedure and results. It has a noble gallery, of spacious and elegant proportions, well lighted, central in situation, and easy of access. The Society enjoys the good fortune of a President, sagacious, far-seeing, and of sound judgment; of Vice-Presidents, all of whom are accomplished, and one eminent; with an Honorary Secretary, not only capable, but willing to give important services; and twenty Councillors, a large proportion of whom mean active service. The Society is very much alive, and well-to-do photographers throughout Great Britain should, for the honour of their profession, decide for membership, although the expenditure may yield no direct individual advantage. At all events, they would get the *Journal*—in its present form well worth having—and obtain the satisfaction of contributing to the honour and dignity of their craft; in fact, be "twice blessed!"

Intending exhibitors will be wise to severely limit the number of examples. There is, every year, sent in twice as much material as can be utilised—much of it greatly below the present standard of excellence, which, year by year, gets shifted higher. This economy would save the Committee of Management a good deal of trouble, and the exhibitors some vexation and expense. Technical exhibits, unless possessing novelty, are not likely to be welcome; but any clear improvement in quality of trade production would, doubtless, be appreciated. There can be no doubt of the honour and competency of the Judges, and of a fair field for all competitors. Both the coming Exhibitions are likely to be visited by increasing numbers, and all photographers desiring of marching with the times will do well to examine both.

PHOTOGRAPHIC COPYRIGHTS.

[Effective Advertiser.]

Has a man a right to his own face—a copyright? It all depends upon certain conditions or legal interpretation of the law of copyright. And the law, or the construing of it—for the law sometimes is one thing and the construing of it another—applies to women as well as men, although might be thought that, considering, as the milkmaid said, "My face my fortune," a lady would have an inalienable right to her face and its presentation anywhere and everywhere. But that is not so. For a few shillings she may, unwittingly, in some cases barter away her rights to her own "face divine"—or demoniac—if the ugly ones, if such there be, ever face the camera, save when they cannot help it, as in the case of a stolen snap-shot or in prison.

The recent action against the publishers of the *Ludgate Monthly Illustrated Magazine*, to recover damages for reproducing in that magazine a portrait of Miss Mary Moore, taken by Mr. Ellis, a photographer, shows that a lady may not have the right to her own portrait if that portrait has been taken by a photographer under certain conditions. Miss Moore had given the magazine permission to reproduce the portrait which Mr. Ellis had taken of her; but, according to the interpretation of the law of copyright, that right lay with the photographer, and not with the lady, who had given the photographer a sitting at his request, and had received some "courtesy copies," but had not been paid anything for the privilege of reproducing and selling her portrait. It was held by Mr. Justice Charles that the photograph was taken by Mr. Ellis for himself, and not for Miss Moore, and that the copyright was Mr. Ellis's, and so the defendant had to pay a farthing a copy—nominal damages. The lady thus found that she had no right to her own features if she had gave the photographer a right to take her portrait for such a "valuable consideration" as a few or many "courtesy copies;" and if anybody reproduced that portrait, even with her permission to use it, he might be mulcted in something more than nominal damages. So reproducers of photographs must be sure that they have got, not the authority of the person who owns the face or the face depicted on the photograph, but of the person who took the photograph.

But one or two questions arise out of this interpretation that might be as troublesome to the photographers as this interpretation of the law will be to publishers. If a photographer has a right to reproduce, and, indeed, obtains a copyright in the portrait of a person when he gives a valuable consideration, whether of a few copies or a cash payment, has he any right to reproduce the portraits of people who have not had such consideration given to them, nor yet their permission been asked, as in the case of "snap-shots?" And could every individual in a snap-shot picture bring an action for damages against the photographer for such unwarranted use of his face and person? And has the owner of a beautiful view the right to claim copyright in its reproduction unless a good and valid consideration has been given for the right to reproduce it? Or do all the rights and privileges lie with the simple manipulator of the cap of the camera—the man who lets the light that carries the scene into the camera, and not with the person who owns the property—be it a pretty country side or a pretty face?

But, again, if a few "courtesy copies" give the sole right to reproduce, why should not the payment for a copy give to the purchaser a right to reproduce? The mere act of taking a photograph does not represent any very "valuable consideration"—even if it is given—for the same work is done by the travelling photographer for sixpence, or, indeed, in Farringdon-street for twopence! and a portrait and a dozen—not courtesy copies, but paid-for copies—can be got for a few shillings from many professional photographers.

But how is the publisher to know that he has the right to reproduce a photograph sent to him? Must he be compelled not only to receive the assent of the owner, but also make sure that the photographer has not a copyright in it? It appears to be so. But, if the photographer has a right to take and make sun pictures, has he a right to sell the reproduction of such photographs to the publisher of a newspaper or magazine without the consent of the person who undoubtedly owns the face or the place? Suppose some one like Miss Moore, who has sat for her portrait to a photographer with a view of his reproducing the portrait at a shilling a copy, say, but who found it was being sold in a reproduction in a periodical for a penny, were to claim damages against the photographer to whom she had given no such right, either expressed or understood—for the right to produce and sell a sun picture at a shilling is a very different thing to selling the right to reproduce it, it may be, in the *Police News* or the *Pall Mall Gazette* at a penny—would substantial damages be given, in law or in equity, against the artist? A shilling a copy on a few hundred thousands would be a nice sum.

The copyright in photographs is sometimes a valuable one. Of course, it depends upon the subject, and sometimes upon the age. Old photographs, like old books and old postage-stamps, old prints and old pictures, become valuable because they are old and cannot be replaced or reproduced as they were originally. First editions have a rare value, where any value is attached to the writings of the authors, and the recent rage in illustrated papers for depicting men and women of note at various stages of their existence, from the cradle to the grave, or as near to their last home as they have got, has given a copyright value to the photographs of people taken years ago, that neither artist nor subject ever dreamt of at the time when the photographs were taken.

Not a few men and women have thus had their likenesses in the seven stages of life, or as many as they have got through, given; and it is becoming as necessary, in these days of illustrated journalism, to show the physical as well as the mental development in the lives they give of the mighty dead, or noted or notorious living. And when a man either joins the "great majority," or is likely to do so, or has some new honour or office thrust upon him, the studios of the photographers are ransacked for the first, last, and intervening portraits that they have of the grand old man in politics or philosophy, in art or science.

Numerous as have been the photographs of Mr. Gladstone, for instance, the demand for copyright interest in his portraits is so great that they are at a great premium; and the publishers who seek to secure them are not confined to this country. Publishers in the United States have been, indeed, in some respects, the most eager to secure such rights, and have been most ready to pay, and pay handsomely, for them; and their example has been followed, where not anticipated, by English publishers. The retirement of Mr. Gladstone from active political life has, indeed, led to an extraordinary demand for copyrights of his photograph, and, although he has been nearly as ready to give sittings to artists and photographers as he has been to give his autograph on post-cards, or in more lengthy communications to those who have written him for the sake of having a specimen of his writing, in many instances to attach his autograph to his photograph, the cry is still for more. For portraits of the "Grand Old Man," a single photograph with the right to reproduce it in the pages of an illustrated journal, as much as 50*l.* has been given, and not in one instance only; while portraits of lesser stars in the political or social firmament, or of women of note in the world of fashion or on the stage, command, relatively, rates equally high from publishers of illustrated periodicals. In fact, what would have been considered fabulous prices at one time are given for a photograph with the privilege of reproduction. From two to ten guineas are common charges for the product of a sitting that a photographer has got some noted character to give him, perhaps years ago, and this is after the run on the sun pictures has long ceased. When death is playing havoc among the great ones of earth, or honours are being scattered abroad, some photographers reap a good harvest from the sowings of days gone by, and

sometimes beyond what they got from the sale of the photographs in the first instance. They send these photographs, of which they hold the copyright, certainly for reproduction in sun prints, to publishers, as the literary contributors do, on "sale or return," and after the manner of the publishers themselves with their wares.

If the photograph be reproduced without the permission of the holder of the copyrights, as in the case above referred to, then the publisher may look out for squalls, and, according to the greatness of the issue or the size of the reproduction, if a lithographic print, is the claim of the owner of the copyright therein. As much as a hundred pounds has been demanded in some instances for infringement of the copyright, and a twenty-pound note has been freely paid for a comparatively trifling encroachment on the copyright of a photographer by a publisher.

Some photographic artists make a point of getting "sittings" for the sake of securing copyrights in the portraits of eminent or popular personages, and they take care to make good their right. It is held that the owner of the copyright in a photograph is the man that takes it—that lifts the cap off the camera and lets the sun or electric light do its work. Some photographers make sure of their good subjects by doing this uncapping themselves, not allowing their *employés* to do it, and they have quite a collection of such copyrights waiting for events that require their production for the gratification of the public thirst for the face divine of the men of the hour, or the keen competition of the managers of illustrated journals for the latest or best or oldest likeness of the hero or heroine who is receiving the passing homage of the nation or the part of it represented specially by their readers.

Where photographs cannot be obtained of the public characters in their youth or manhood, portraits in oil or water are sought after to be reproduced by the photographic artist, who is now the chief illustrator of our pictorial literature, and nothing is too high or good for him in nature or in art, from the highest peak of the Himalayas, the Mountains of the Moon, not in Africa only, but the extinct craters in the moon itself or the invisible stars, which photography has revealed, beyond the ken of the keenest vision of man even when assisted by the biggest and best telescope—a fact and apparent paradox upon which Dr. Ball dilates with such effect, unction, and Irish humour. The works of the best artists are also reproduced by the photographic and zinco artists with a fidelity that is amazing, or once was, for familiarity with the process has bred contempt of the once marvellous. Not yet is anything too low for the snap-shot artist, and the privacy of home soon loses that character when the eye of the camera has been upon it and a speculative photographer has lifted the cap off his instrument and secured the scene with or without the sanction of the owner. One noble owner of pictures by the best artists allowed a photographic artist the privilege of reproducing any of his pictures in collotype, provided they were not sold at less than five shillings, not wishing his fine paintings to be hawked about, it might be in Cheapside, for the humble penny.

These new phases in the photographic business have helped not a few over the dull times which of late have come over the profession, so far, at least, as the ordinary portrait-taking in *cartes* or cabinets is concerned; and the selling of copyrights has been more profitable in some cases than the printing of sun pictures, which formerly was the sole work of the craft. The process which has played sad havoc with wood-engraving has given employment to many handlers of the camera who never were in the *carte* business, while the finest instruments are in the galleries of the process-block makers, who have not yet claimed a copyright in their productions after the manner of some foreign firms or photographic artists. The publisher who buys a block or a photograph has now some difficulty in knowing whether he has the right to produce, even after he has purchased, block or picture.

ON PHOTOGRAPHS OF THE MOON TAKEN AT THE PARIS OBSERVATORY.

[Nature.]

QUITE recently some negatives of photographs of the moon, taken at the Paris Observatory by MM. Lœwy and P. Pruiseux, were exhibited at the Academy of Sciences.

The negatives have been carefully studied, enlargements made, and specimens sent to all the principal scientific societies interested in them. These enlarged copies are of great help in the study of the moon, and have been the means of making clearer many uncertain points, for they allow every detail to be seen without difficulty. Their chief advantage, however, lies in the great expanse of surface which they embrace; many facts, hard to discover on the smaller negatives, have now been ascertained.

In their communication made to the Academy, MM. Lœwy and Puiseux gave an account of the results they have obtained in studying these photographs. Some of them are of great interest.

Considering, first, the moon's surface, they note that its markings are of a less varied type than those of the earth, and its prominences are chiefly of a circular shape. By the way in which the moon reflects, it is thought that its crust is of solid matter, similar to volcanic rocks. This agrees perfectly with Laplace's hypothesis, in which he states that the moon was thrown off from the earth when the latter was in a nebulous state. The moon's mean density scarcely surpasses that of the crust of the earth; its materials, judging exclusively from the exterior crust, are of a more uniform chemical composition. But, although we might trace its history from the time in which it was thrown off from the earth, it is clear that all the facts rest on a very uncertain basis; it is scarcely probable that the moon had the same appearance then it has now; it is only when the masses had become to a certain extent solid that the surface markings could have been formed which are now to be seen. A very long period must have elapsed between the nebulous state of the moon and its present fixed condition, the process commencing, no doubt, by the union of the particles of scoriæ. Owing, however, to currents arising from various sources, ruptures must often have taken place, causing lines to be left on the parts which were not quite solid.

The various lines, which can be followed on the photographs, may be quite easily described. They are valleys between huge mountains. One of the largest is the valley of the Alps, to the west of Plato; another one between Herschel and Hipparchus, between Bode and Ukert; and one to the south-west of Rheita. It would be absurd to imagine them anything like the terrestrial valleys; they are almost perfectly straight, do not branch off at all, and keep the same width almost the whole length. There is no sign of what has become of the materials out of them, and, when minutely examined, they appear to have flat bottoms; this fact seems to prove that they were once filled with some liquid which has dried up. As before stated, their origin is most probably due to currents, which must necessarily have developed in the mass of the moon when still fluid. These valleys are grouped about in various parts, and run parallel chiefly, especially near the equator, but they also go in other directions. There is nothing to show that the direction has remained the same.

So long as the revolution and rotation of the moon were not performed in the same time, the tides must have produced very considerable change of level, which would hinder the crust from becoming solid. The scoria, therefore, would gradually form itself into larger and larger islands, which, however, might often have got broken up owing to constant collisions. Still gradually gaining in thickness, they eventually constituted the oldest part of the moon, and at their expense the circular formations were formed which we now see. After a time banks of scoriæ of great length covered the moon, leaving only narrow passages for circulation. Continual collisions destroyed the projecting parts, which facilitated the ultimate joining of the islands.

The fluid masses of a body like the moon take part in the general circulation, but naturally have their tides under the influence of gravity. The combination of these two movements produces irregular rates in the floating masses, which more or less always impede their displacement. This irregular rate causes renewed collisions and rectilinear formations differing in direction from the first. After such various forces had been brought into play, it is not astonishing that the marks left are not absolutely regular and symmetrical. The parallel lines indicate the existence of similarly directed currents at the time the superficial solidification was going on. The lines running in different directions indicate changes in the direction of those currents.

Let us now consider the result of a huge boulder of crust getting detached and falling. If falling on a slope, it would naturally slip down, and in the matter, not yet solid, form, as it were, a path; thus ultimately a valley would be made. This explanation applies itself more especially to the valley of the Alps, because of its very precise shape. If, therefore, these valleys are imperfect joinings of ancient ruptures, they must form, on the hard crust, lines of less resistance. The lines of craters are now easily explained, also the various holes in the furrows, which may be looked upon as explosion outlets.

If, on the other hand, they date from superficial solidification, their presence must have influenced the subsequent formations. Admitting that, under a part of the crust already thick, a diminution of pressure is produced, capable of producing a cavity, these changes might be brought about by the gradual cooling of the moon, or by the movements of the interior tides. The cavities might take almost a circular form if the crust were homogeneous, having for the centre the point where the pressure was at a minimum. But, if there are other ruptures and lines, they would probably form the boundary to the cavity. We notice that the polygon form is most frequent after the circular; in many cases, also, the furrows form tangents to the circles.

MM. Lœwy and Puiseux remark, finally, that it is not for them to say which of the hypotheses is correct; they merely wish to call attention to the immense help the enlarged negatives may prove themselves to be. Eventually, no doubt, they will be the means of making a map, which may show us that the surface structure of the moon is very similar to our own.

We imagine that not every one will agree with all the opinions above expressed by MM. Lœwy and Puiseux, but it is clear that several important questions have been raised by the magnificent photographs we owe to their skill and industry.

HALF-TONE ENGRAVINGS BY THE ENAMEL PROCESS.*

The Dark Room.—The dark room should be arranged with everything so conveniently placed as to be readily found in the dim light necessary.

* Continued from page 573.

This need not be so very dim, however, as to become a source of confusion, the wet plate not being nearly so sensitive as the gelatine dry plate of the photographer; but the light must be made non-actinic in character by being strained through a coloured medium, either of glass, cloth, or paper, that it may not affect the sensitised plate while it is being taken out of the bath and placed in the camera-holder. If the light is taken from an outside window, it may be partly blocked out, while a portion may be covered with orange-coloured cloth or paper. A clearer light will be obtained in which to observe the action of the developer by placing a pane of ruby-coloured glass into a section of the sash. If dependent on gas or artificial light, it should be enclosed in a lantern or other enclosure, and protected by ruby or orange-coloured glass. The incandescent electric light is very convenient when it can be readily obtained. The sink and water tap should be so placed with relation to the light as to be readily accessible at the moment development is seen to have reached the desired amount of detail.

Sensitising the Plate.—The bath having been prepared and in working order, the next operation is to make sensitive to light the glass plate. This having been flowed with the collodion as described is laid on the dipper, and, with a steady, unhesitating motion, lowered into the bath, stirring it a few times, but not raising it so high as that any part of it will be out of the solution. This may be done with the full light up in the dark room; but in placing the plate into the bath let it be shaded by the person or otherwise until the cover is placed over it, otherwise "fog" may be the result. It should be allowed to remain in the bath until sufficiently sensitised, for which five minutes is about right, though with a bath that has been some time in use a few minutes more will do no harm.

In taking the plate from the bath, raise the dipper with the same steady motion as in inserting, as any stoppage will surely leave a mark across the plate. Allow to drain for a few seconds, and then set against the wall or other support, and wipe the back with blotting-paper, and place in the camera plate-holder, which has been previously set to fit the plate and screen. As heretofore arranged, the screen and its frame or holder is of size to fit the size of plate used; but recently a plate-holder has been invented accommodating any size of screen or plate, and with a device by which the separation of the screen and plate may be regulated to a nicety, which must prove a valuable adjunct to the working plant of the process worker.

The Screen.—At this point it may be well to consider the screen and its use. It is an indispensable accessory to half-tone work, for without its assistance it would be impossible to etch plates from photographs or wash drawings capable of being printed by the typographic process. By its influence the picture is broken up into minute points, which present a surface to the inking rollers of the press, without filling up the interstices between, and so preserving the picture. According to the fineness of the ruling of the screen will be the fineness of the resulting print; but, on the other hand, it will call for superior paper being used and greater dexterity in workmanship in the printing. The fineness of the screen should therefore be commensurate with the ultimate intention in the use of the engraved plate. If it is to be printed on a common quality of paper, then a screen of coarse ruling—say, of eighty lines to the inch—should be employed, while screens of from 132 lines and up to 175 will necessitate the finest-coated paper and the most skilful presswork. For more ordinary work screens of 120 to 124 lines to the inch will be found most serviceable, but, to get the best results out of these, a good coated paper and an experienced workman at press are needful.

Distance of Screen from Plate.—But a matter of much importance in working with the screen is the distance of separation between it and the sensitised plate. This distance will range from one-sixteenth to one-eighth of an inch, to be regulated according as the desire of the operator is to get the high lights up without using a larger stop or giving longer time of exposure. The use of the screen in this respect will be understood when it is pointed out that the influence of the wider separation is to allow the light so much more space in which to spread, and thus fill up the high lights. With this fact kept in mind, a wide field is open for experiment, and the acquisition of practical knowledge which can only be thus attained.

Cleaning the Screen.—It is of the utmost importance that the screen be absolutely clean, and to get it so is more difficult than might be expected, the smallest stain from the fingers or other source being observable on the negative. Perhaps the simplest way to clean is to fix in a screw vice, which is made for the purpose, and not costly. Keep a little of the finest French chalk mixed with alcohol at hand, and apply a few drops, rubbing over the surface, afterwards polishing with a little pure alcohol or distilled water, applied with some absorbent cotton, and lastly rubbing up with a clean bit of soft, old silk. It takes a close scrutiny to discover streaks, and a careful examination in all lights is necessary.

The Camera.—Having inserted the sensitised plate and closed the holder, the next operation will be with the camera. This should be of size to accommodate the screen and plate chosen, and be erected on a platform on which it can be made to slide far enough for considerable reductions being made. There must be perfect vertical alignment between the camera and the picture to be copied, and this is best attained by the copy-holder being placed on the same platform, and also made to slide on it. A platform about ten feet long will be found a useful length for ordinary work. It may be conveniently erected on a table with castors, that it may be readily moved about, and springs that may counteract any vibration that may occur during exposure. The camera and copy-holder being placed on the same platform, any vibration occurring will be imparted to both plate and copy alike. Another method of counteracting any vibration is to suspend the platform with camera and copy-holder from the roof; but, unless the operator's light is from a steady source, the former plan will be found most convenient, as it can be shifted about so as to suit the direction of light at any time of day.

The Lens.—The lens is perhaps the most important item of the process worker's outfit. There are many good lenses on the market, and those of any of the reputable makers will afford a guarantee of suitability. It will therefore be the truest economy to procure the best the intending operator can afford to purchase, and he has a wide choice. It should, however, be of the rectilinear class.

A lens that has met with considerable favour with half-tone engravers is the Steinheil Wide-angle Aplanat, Series VI. It gives perfect flatness of picture and sharpness of image, together with considerable field.

The Diaphragms.—The diaphragms—or stops, as more familiarly spoken of—are an important adjunct of the lens, and considerable judgment is necessary in the use of the several sizes, which can only be acquired by experience. It should be kept in mind that they are related to each other by regular gradation, and that the diameter of each is a proportion of the length of focus of the lens. The gradation followed, as a rule, gives a value double—*i.e.*, admitting double the amount of light—that of the smaller one immediately preceding. One or two general rules regulating their use may be laid down for easy remembrance: 1st, in copying a picture, and making a considerable reduction, use a small stop, commensurate with the amount of reduction. 2nd, A small stop gives greater detail in the shadows, sending the light rays more directly, or in straighter line, through the screen. 3rd, The larger stops allow the light to spread, and so have relatively a greater influence in filling up the high lights. Keeping these rules in view, it will be readily comprehended that the use of too large a stop will fill up the high lights of the picture before sufficient detail could be got in the shadows, and the inference naturally follows that, when a lack of detail is observed, a smaller stop should be used. The character of the picture to be copied has also to be judged, and, as a rule, should it contain much of dark shadow, a small stop and longer time of exposure is indicated, so as to get enough of detail. It is a good method, and will bring out the best results, to use several stops—say, two or three—and proportion the time with each as to give detail in the shadows by so much given with the small stop, so much more given with the next larger, and possibly a shorter exposure with a still larger for the high lights. It is well to aim for getting the high lights right, the detail in the shadows being more easily got by giving more exposure with the small stop.

Diaphragm Apertures.—The stops or diaphragms sent with lenses as purchased usually have their apertures round in form; but recent investigation has shown that other forms may be used with advantage. Square apertures, or square with the corners cut out, also diagonal, as follows, are each seen to have a varying influence on the shape of the dot, and through it on the picture resulting. Every square in the screen acting as a separate lens causes the dots to partake of the shape of the apertures used. This investigation has been very fully made by Dr. J. M. Eder, of Germany, and Mr. Levy, of Philadelphia. The latter gentleman gave the result of his investigations in a very interesting article in the *Paper and Press*, and has invented a form of diaphragm in which the shape of the aperture may be modified or changed. The elaborate writing of Dr. Eder has been translated and published in the *Process Photogram*, of London, England, and from it we extract the following paragraph, as presenting the gist of the whole:—

"With square diaphragm apertures the preparation of half-tone negatives is rendered easier and more certain than with round ones; the reason of this lies in the fact that the corners of the square negative dots in the high lights beautifully coalesce, by which means the dot remains open, so that the square stops—even if their ratio aperture may not be so great as that of the round ones—it is easier to obtain undulated half-tone

negatives. Square stops with the corners cut out act still more favourably under some conditions. A square stop with corners cut out I specially recommend for half-tone work; the beginner should commence his experience with such a stop. The influence of the diagonal aperture is to present the dots in lines, and this will be more readily observed if one half the time allotted to this form be given the one way, and the diaphragm turned round so as to give it in the other direction. These special diaphragms may be made in cardboard and blackened."

The Copying Board.—The copying board should be so placed as to be conveniently shifted to accommodate any reduction or enlargement that may be required, but at the same time retain its being in position perfectly vertical to the camera-holder. This is secured by being erected on the same platform as the camera, and running in the same grooves. The copy may be affixed in any way convenient, only where special means have to be adopted to keep it flat; perhaps the simplest way is to place a piece of plate glass over it, for which it is as well to make provision, so it may be readily fixed, and at the same time impinge with some pressure on the copy. With a couple of catches of thin brass at the bottom to support the weight of the glass, into which a wedge of folded paper may be pushed to keep it tight, and pieces of spring brass at sides and top, secured with a screw at end, so that it may turn in any direction and hold, it will be found all that is needful. In the use of a plate-glass cover, however, it should be seen that no reflections proceed from it, and, if there are, means must be taken to obviate them. And this leads us to the next important consideration, that of

Light.—If you have access to the skylight of a photographer's gallery, or can erect such, you are all right, and have at hand a most potent assistance in securing suitable negatives with greater certainty and with less perplexing judgment. But you may be dependent on a side light from a window, with every variation of cloud and sunshine, rain or clear weather, while volume and intensity will also vary with the season, and it will call for the exercise of much study and waste from many trials on plates and patience to secure the exact conditions of a good negative. A northern light will give the most steady, and have less variation, but more frequently one has to make the most of what he can get, and then it lies for the man of inventive parts to bring out good results from circumstances as he finds them. Direct sunlight may even be used, and good negatives secured by it with very much shortened time of exposure.

Exposure.—The varying circumstances of light—the fickle clouds and uncertain haze, the meridian glare and the slanting ray of the morning and evening, as well as the summer's glow and the winter's mist—render the time of exposure a matter of exceeding difficulty, which experience only can overcome, and enable one to attain to the exercise of a just judgment. It may be mentioned, however, that an exposure through a screen for a half-tone negative will take about four times that of a negative intended for line work. Before uncapping the lens, examine the conditions of the light, and determine what stops you will use, and mark down on a slip of paper the time you intend to give to each; then turn the hands of a striking clock to the time allotted to the first stop, and the instant of its striking will give a perfect warning the time is exactly up, when the lens may be capped and the stop changed, and the clock again set to keep its vigils for the fulness of time.

Exposure Example.—As an example of approximate timing, we will suppose a picture to be copied, and to be reduced to about one-half. Referring to what has been said regarding stop apertures, we would use that marked No. 1, or a round aperture of same size, say *f*-75, and give seven minutes; then change to No. 2, *f*-50, and give two minutes; change again to Nos. 3 and 4, same size, and give one minute each; being eleven minutes in all, with a fairly clear light, through a screen of 120 lines to the inch, and with a rapid rectilinear lens of a reputable make. The light, or other circumstances, may call for a different exposure, but this is given as an example that will be found nearly correct.

The Developer.—Make a saturated solution of the protosulphate of iron, of which take twelve ounces, and add to it two ounces of acetic acid and twenty-four ounces of water. Some add a little alcohol, but this is not necessary unless the silver bath is getting out of order from use, or the accumulation of iodide, alcohol, or organic matter in it, which may be known by a difficulty in flowing the developer over the plate, and may be accepted as a warning to see after a new bath, and an early rectification of the old.

The Fixing Chemical.—The agent used to fix the picture, or destroy the sensitive character of the plate, is the cyanide of potassium, made up in solution in the proportion of one ounce of cyanide to twelve ounces of water. It is highly poisonous, and should be carefully kept from any scratches or brasures on the hands, and so save any risk of blood-poisoning.

Development.—The exposure made, retire with holder to the dark room, which we have supposed to have been fitted up with sink, water, and the usual necessary equipment of such "dens." The developer and the fixing chemical are supposed to be lying convenient to hand. Take the plate from the holder, and, holding it by the corner in the left hand, flow the developer with a steady and rather copious sweep over it, yet permitting as little as possible, or none, to overrun. Flow back and forth until the appearance of the image, which, if correctly timed, should be in a few seconds, and watch for the coming of the details of the picture, and, on the instant that they are seen to be sufficiently full, stop further development by putting the plate under the tap and letting the water flow freely over it. Guard against over-development. If allowed to go too far, there will be a veil or fog over the plate, which it is difficult to get rid of, with great risk of spoiling the negative in the attempt.

Trimming the Negative.—The development having been carried as far as desired—*i.e.*, with the detail fully out, but no more—and washed with a generous flow of water, it is now ready for being "fixed," that is, the image rendered non-sensitive to the light, which is done by flowing over the plate the before-mentioned solution of cyanide of potassium, when the whole picture will be seen immediately to clear up. Before doing so, however, it is well to trim up the negative by scraping away with the thumb the film from the outer margin of the picture, allowing about an inch or so to remain. As the film is very rich in silver, a small receptacle should be provided, easily found in the dim light of the dark room, where that portion scraped off may be put and preserved.

Examination of the Negative.—The plate may now be taken into the light and examined through a microscopic focussing glass, and the attention first directed to the condition of the dots seen in the high lights, *i.e.*, the dark portions in the negative. These will have come right if they almost, but not quite, touch each other, while the dots in the half-tones will be of sizes varying as they tend to light or shade, and the deeper shadows will have smaller dots, but sufficiently pronounced to permit a little diminution in the after-process of clearing. Should the high lights not be closed enough, and instead show considerably wide cross lines, then a longer exposure with the larger stop, or possibly increasing the distance a trifle between the screen and plate, is indicated. If the dots in the shadows are not sufficiently strong, then a smaller stop, or a longer exposure with the smallest stop used, is the remedy. Keeping these rules in mind, with a little practice, the operator will soon master the principles and attain familiarity in working.

Intensification.—However well defined the image may appear on the plate at this stage, it is never so clear as that a satisfactory plate could be engraved from it. It requires to be "intensified." To do so, there are two methods that may be adopted, both of which have their advocates. One of these uses the bichloride of mercury as the agent, the other employs a solution of the sulphate of copper and bromide of potassium with nitrate of silver. The formula and operation with the first are as follows:—

Bichloride of mercury	2 ounces.
Muriatic acid	½ ounce.
Water	25 ounces.

Allow the plate to remain in this solution till it is bleached white, when it should be well washed in running water, and then flowed over with the following:—

Hydrosulphuret of ammonia	1 part.
Water	4 parts.

This will make the plate an intense black. After being well washed, it should be flowed over with a weak solution of nitric acid, in the proportion of one drachm to four ounces of water, well rinsed under the tap, and set aside to dry. It should be mentioned that the bichloride of mercury is the well-known corrosive sublimate, a deadly, irritant poison, and should be used with extreme caution.

The formula and operation with the other method are as follows:—

Sulphate of copper	25 grains.
Bromide of potassium	15 ,,
Water	1 ounce.

Flow this solution while the plate is held in the hand. It will at first discolour or darken the film, but in a few seconds will bleach to white. After it has whitened through, let the tap flow over it till thoroughly washed, which will take about five minutes. The washing should be uniform all over, and, if allowed to lie under the tap, the water should be directed in an equal stream over all parts. It should then be flowed over with the following solution:—

Nitrate of silver	40 grains.
Citric acid	5 ,,
Distilled water	1 ounce.

Under this application the plate will blacken over, when it should be again thoroughly washed.

Clearing the Negative.—It is more than probable that it will not yet have been sufficiently cleared to print, in which case it should be flowed with the following solution of iodine:—

Iodine.....	40 grains,
Water.....	4 ounces,

with iodide of potassium added in small quantities at a time, and shaken until all the iodine scales are dissolved. This will be of a deep brandy colour. After allowing this solution to act upon the film a few seconds, it should be well rinsed in water under the tap, and flowed with a *very* weak solution of cyanide of potassium, which will instantaneously whiten over the film, and the image will be seen gradually to clear up. Great caution, however, is needful in this operation. Should the cyanide be too strong, or allowed to act too long upon the film, it will sweep away the dots in the shadows, or cut away so much as to render the negative valueless. The tap should be kept running while operating with the cyanide solution, ready to stop its action the instant it is seen to clear up. If an examination reveals that it is not yet sufficiently clear, the operation may be repeated. Should any part be seen to require clearing more than another, a small stream of the cyanide solution may be so poured from the graduate as to be directed on the clouded part without reaching the rest, though to do so will require delicate handling and much caution, as, a little overdone at this point, the whole negative may be spoiled. When seen by examination with the focussing glass to be sufficiently cleared with the cyanide, it should be again well washed, flowed with the foregoing weak solution of nitric acid, and afterward blackened with the solution of sulphuret of ammonia mentioned above, flowed again with the nitric acid, washed, and set aside to dry. Wash well after flowing with all the solutions. ROBERT WHITTET.

(*To be continued.*)

THE MOSELLE: A CONTINENTAL BYWAY.*

By an Itinerant Photographer.

On our way to Trarbach we enjoyed the novel sensation of being *punted* on a steamer. The little vessel at one part of its course encounters for a hundred yards or so the full force of the stream, dashing, in veritable rapids, with a depth of but a few inches, over its stony bed. Full steam here only sufficed to keep us motionless in the water, and it needed the united efforts of two men and a boy armed with poles to get us into comparatively calm water again. We were over an hour in moving a distance well within a mile, figures which give a better idea of the force of the current than any mere verbal description.

At Trarbach is to be found one of the most comfortable inns at which it has ever been our fortune to rest, the Belle Vue. Herr Allmacher, the landlord, is just now full of the novel honour of being agent to the Mosel Dampschiffarts Actien Gesellschaft, the steamboat company, whose new pier is immediately opposite the Belle Vue. This pier which was formally inaugurated with many *Hochs* during our visit, will prove a great convenience to tourists, since before its construction the boats called at Traben only, the village on the opposite side of the river, and those who wished to stay at Trarbach were compelled to cross by the ferry, frequently a lengthy operation. The popularity of the pier was conclusively shown even during the few days we spent there.

High up upon the hills overhanging the town are magnificent pine forests, accessible from the Berncastel footpath, through which delightful rambles can be made in all directions. This high ground, which can be reached in about half an hour, affords a surprise to those who, having merely seen the Moselle from the boat, climb up its banks for the first time. The traveller finds himself almost instantaneously among scenery absolutely distinct and widely different from that which he has just left. The Moselle and its valley, the moment the hill top is passed, is out of sight, and a wide, rolling, and decidedly hilly country, well wooded but without a single vine, is to be seen stretching away apparently unbroken for many miles in all directions, the view strongly suggesting a Sussex landscape. Up here one is evidently at the former level of the entire country, the river having in the course of ages cut for itself a narrow channel down below, which channel any one on the upland quite overlooks, seeing the undulating corn land and woods beyond. It is only when an attempt is made to reach the distant scene that it is possible to realise that it is cut off by a deep and abrupt gorge.

On these uplands quite different work presents itself for the camera, and, given sufficient energy to drag the photographic paraphernalia up the steep paths from the valley, and sufficient skill to use it when this has been done, many pictures of the type familiar to photographers in the works of Colonel Gale, Karl Greger, and others, can be secured, or, at least, the raw material for such is to be found.

Trarbach possesses, in addition to its many other attractions, very good bathing in some river pools just above the town for swimmers; but, the bottom being irregular and stony, it is not so well suited for those who need to keep their feet down. This may be said indeed of all Moselle bathing places, that, while excellent for swimmers, they are not good for those who cannot swim.

The trip from Trarbach by river up to Trèves is a pleasant one of about nine hours' duration. The boat leaves at seven o'clock in the morning, and is due in Trèves at four, but it oftener arrives at six. Berncastel and Piesporter are the most important places *en route*, the latter being celebrated for the best wine of the district. A few miles below Trèves the hills, which until then have hemmed the river in between very narrow limits, fall back, and the rest of the journey is performed through a wide open plain. Here are to be seen several ferries working, as nearly all on the river do, by means of a wire stretched across from bank to bank. But in these few instances the wire, instead of being supported on a couple of iron or brick columns, passes from top to top of two quaint limewashed rectangular towers, with pyramidal roofs of slate—towers which, both by their design and from their situation, are peculiarly picturesque, and figure in many a picture of the neighbouring scenery. Trèves itself is full of antiquarian remains, and claims to be one of the oldest towns of Europe, long antedating Rome itself. Whether this is so or not, it is, at any rate, very old, and the Romans have left very marked traces of their presence in the shape of baths, a theatre, and other buildings, including the famous Porta Nigra. These, as well as the Cathedral and other churches, possess attractions for the archæologist and architect, but the photographer who aspires to produce works of art will probably devote more time to the portrayal of some of the nooks and corners in the old town, which date back merely a few hundred years or so. Passing up some of the alleys and byways, combinations of lines, caused by the overhanging roofs, leaning walls, and generally the semi or more than semi-ruinous buildings, are to be met with, over which the artists are accustomed to go into raptures. They certainly lend themselves to depiction by the pencil and brush better than by the camera, but the latter will be found, at any rate, to be better than nothing.

It was in Trèves that, driven to shelter from a violent thunderstorm, we entered the porch of a professional photographer, and found in his show-cases some of the finest instantaneous photographs of their kind we had ever seen. They were of large size, taken direct, and had for their subjects street processions, military manœuvring, &c., some views of cavalry swimming across the river striking us as particularly good specimens of work done under difficult conditions.

From Trèves Luxemburg is easily reached, and thence the Ostend-Basle express takes the tourist to Brussels and England direct. This route is the shortest; but, with time to spare, a far pleasanter one is that *viâ* Gerolstein and Düren, seeing the Eifel district in passing. To effect this, the luggage should be sent on by rail from Trèves to Gerolstein, and the same route taken, but only as far as Kyllberg. At Kyllberg the train is left, and, with no more baggage than can be comfortably carried, the fifteen miles of forest that lie between that place and Manderscheid travelled on foot. The forest is, perhaps, as fine as it is possible for a forest to be, as far as pedestrians are concerned—the ground soft and springy to the foot, the trees arched overhead to form one long avenue, the route to be taken (for there is no clear path) being indicated by splashes of paint on the trees, which answer to the colonial "blazing." The paint is, however, an improvement on the blazing, since a different colour is employed for each route out of Manderscheid, and a board in a conspicuous place in that village indicates the colour of the guiding marks along each path. The idea, and the thorough and careful way in which it was carried out, struck us as most forcible and eloquent testimony to the practical nature of the German mind. At Manderscheid are one or two inns of a comfortable if homely nature, and a night's rest obtained there, the next day the walk can be resumed for another twelve or fourteen miles to Daun. In the neighbourhood of Daun are to be found the best specimens of the peculiar and singularly beautiful crater lakes—pools of water of great depth, occupying, as their name implies, the craters of long-extinct volcanic mountains. The Eifel is essentially volcanic in its origin.

The new line of railway is now open connecting Daun with Gerolstein, and this can be employed for reaching the latter town, or the distance, about ten miles, can be covered on foot, which, for those who wish to see the district, is preferable. At Gerolstein the heavier luggage sent on

* Concluded from page 535.

from Trèves can once more be obtained, and the rail taken either to Düren or to Aix-la-Chapelle, both of which stations are on the Cologne to Brussels line, and so home by any of the numerous routes available.

As we said at the outset, the Moselle and Eifel district is not only singularly beautiful, but is characterised by an absence of the globe-rushing tourist, which is complete and delightful. Long may it continue so. As a place to secure "a change of scene and rest" of a milder and more temporary nature than that prescribed by his doctor to Bill Nye, it is almost impossible to surpass it, and when another year comes round we hope once more to find ourselves there. Readers of the JOURNAL might do worse than to "try it for themselves."

THE LATE MR. B. J. SAYCE.

WE have received the following circular from the Liverpool Amateur Photographic Association:—

"*Percy-buildings, Eberle-street,*
"*Liverpool, August*, 1895.

"B. J. SAYCE (DECEASED).—At a meeting of the Council of the above Association, held in the Club rooms on the 9th day of August, 1895, the following resolution was proposed by the President, Mr. G. B. Newton, and seconded by Mr. Paul Lange, and carried:—'That a Memorial Fund be started by the Association, to be called "The Sayce Memorial Fund," and that the proceeds thereof be handed to Mr. Sayce's widow, and that Mr. John Hargreaves be, and is hereby appointed Hon. Treasurer of the Fund.' The Council of the Association, in sending out this circular, take the opportunity of saying that they feel that the Association, and the Photographic World in general, are greatly indebted to the man who has probably done more than any other to render Photography practicable and simple by his early discoveries in the dry-plate processes, which have been the main basis of all modern photography. They recognise the fact that, although the researches and experiments cost him much time and money, Mr. Sayce has for over thirty years given the benefit of his discoveries free to all the world. It would be difficult to conceive what a revolution in the art of depicting scenes of every kind, and in the art of illustrating books and papers, has been wrought by photography, but to the simplification of the photographic processes for the vast number of amateur as well as professional photographers of every nationality the world is under a deep obligation to Mr. Sayce. Like many great inventors, Mr. Sayce's first object was, not to lay up a fortune for himself, but to give the benefit of his work to all who chose to profit by his experiences, and so it is now regrettable to find that at his death his means are very small. The Council of this Association (with which, of course, he was most closely identified locally), so soon as this state of things came to their knowledge, resolved to inaugurate a Memorial Fund: Firstly, as a testimony to their late fellow-member's genius, character and worth; and, secondly, as a fund for the benefit of Mr. Sayce's widow, it having been ascertained that such a fund would be most useful and acceptable to her. The Council feel assured that the foregoing facts need only to be made known in order to command a hearty response, not only from photographers, but from all others whose senses have been delighted, and who have been otherwise benefited by photography, much of which is the result, directly or indirectly, of Mr. Sayce's discoveries. Subscriptions to the fund may be addressed to the Hon. Treasurer of the Fund, John Hargreaves, Esq., at the Club rooms, when an acknowledgment will be sent."

Our Editorial Table.

THE PAGET PRIZE COLLODIO-CHLORIDE PAPER.

Paget Prize Plate Co., Watford.

WE have received from the Paget Prize Plate Company a sample packet of their "Special" collodio-chloride paper, which has lately been placed on the market. The film is of exactly the same nature and quality as that with which the "C.C." Rives is coated, but the "Special" paper is cheaper, the saving in the cost of manufacture being in the difference in price between Rives and Saxe paper, upon which latter the "Special" is coated. The "Special" paper, it should also be mentioned, is solely intended for the professional photographer, and is only supplied in gross boxes and sheets (quarter-quire being the minimum quantity).

Collodio-chloride paper possesses certain distinctive characteristics which will always commend it as the *beau-idéal* of a print-out surface. Briefly put, the chemical inertness of the vehicle itself interposes no discoverable barrier to the complete action of the toning, fixing, and washing solutions, which is equivalent to saying that collodio-chloride paper is not liable to give impure whites, and that impermanence may not be dreaded as with other papers, while it likewise follows in theory, and results in practice, that under suitable working conditions the silver image in collodion is amenable in the highest degree to uniformity and evenness of toning.

We were extremely pleased with our trials of the Paget "Special" paper, and do not doubt that it will become highly popular with the profession. It yielded us results which, toned and fixed in separate baths, were the perfection of surface prints, rich in colour, with exquisite detail, and entirely free from "double tones." Great care has obviously been expended in the preparation of the paper.

So useful and sound are the instructions for working the paper issued by the Paget Company that we here reproduce them:—

"*Printing* should be somewhat darker than the finished print is required; about the same as for our P.O.P., not quite so dark as for albumen.

"*Keeping.*—Both the unprinted pieces of paper and the untoned prints are best kept in a cool place, closely packed together, flat, and under slight pressure. If left loosely exposed to the air, the collodion film may dry and harden, becoming more liable to crack during the toning and subsequent operations. Toning should be done as soon after printing as convenient—the same day, or at farthest the next day if possible.

"*Washing.*—Before immersion in the toning bath the prints should be *very thoroughly washed* for at least five minutes in running water or in three or four changes. If running water from a tap be used, it should not be turned on too violently, as it may tear or injure the film.

"It was formerly recommended to use *hot* water for washing. A thicker paper, differently prepared being now used, hot water is no longer necessary, and should *not* be used, as it has a tendency to render the collodion brittle and more easily damaged.

"*Salting.*—After washing, it is advisable to place the prints, for about one minute, in a solution of common salt, strength unimportant, say, one ounce to a pint of water. This removes any last trace of silver and reddens the print, so that the progress of toning can be more easily judged. After salting, wash for about five minutes before toning.

"Salting is not absolutely necessary, and may be omitted if desired.

"*Toning.*—Any of the ordinary toning baths employed for albumen or gelatine may be used, but no bath gives such rich brilliant tones, either warm or cold, as the sulphocyanide. If a little care be taken to ensure clean dishes and clean fingers, there is no bath more simple or certain. We strongly recommend this bath in preference to any other:—

Sulphocyanide of ammonia	30 grains.
Gold chloride	2 „
Water	16 ounces.

"Tone to exactly the colour desired, judging the prints as they lie in the dish; but it should be borne in mind that the finished image will be slightly bluer and stronger when dry than in the wet state. Wash and fix in—

Hyposulphite of soda	3 ounces.
Water	1 pint.

"Allow at least ten minutes for fixing. Wash thoroughly in running water for at least an hour. Do not on any account wash longer than two hours; never leave in the water all night.

"The prints may be damped off on blotting-paper and left to dry or may be dried quickly in a moderate heat. They should *not* be left to dry *between* blotting-paper, unless the latter is known to be pure. Impure blotting-paper makes spots and mottled marks on the prints.

"*Mounting, &c.*—When finished, the prints may be mounted either wet or dry in the ordinary way with starch, and afterwards rolled, burnished, or enamelled, in fact, treated in every way in exactly the same manner as albumenised paper. If a *roller* burnisher be employed, no lubricant is necessary; if a *bar* burnisher be used, the prints may be rubbed over with flannel, which has been previously rubbed on a piece of *dry* Castile soap. No alcoholic lubricant may be used for collodion.

"*Enamelling.*—C.C. prints cannot be satisfactorily glazed by simply laying down on glass after the manner of gelatine, but may be easily enamelled with collodion in the manner usually practised on albumen pictures. The plate glass, which has been French-chalked, is coated with enamel collodion and the latter allowed to dry. The print is soaked for a few minutes in a warm solution of gelatine (one part of gelatine in twenty parts of water). Some of the gelatine solution is poured over the collodionised glass and the wet print laid face downwards on it, the surplus gelatine being squeegeed out, leaving no air bubbles between the print and collodion. The whole being left until thoroughly dry, the enamelled print can be easily stripped from the glass. Gelatine P.O.P. prints may be treated in the same way, and are then better protected against damp than when the gelatine surface is merely glazed."

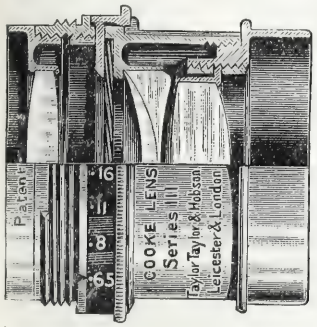
It is, perhaps, needless to say that the Company are continuing to supply the original "C.C." on Rives paper.

Altogether we applaud the efforts of the Paget Company to popularise collodio-chloride paper.

The Cooke Lens.

By Taylor, Taylor, & Hobson.

The intimation made by Mr. Willliam Taylor, on the occasion of the introduction at the Royal Photographic Society of Mr. Dennis Taylor's new "Cooke" lens, that his firm was about to manufacture and place it on the market, is now fulfilled. We have already published an account of this new optical instrument, of its construction and the principles underlying it, and now have only to report that in the commercial sense it is *un fait accompli*. Although science, as well as art, is cosmopolitan, yet will Englishmen as such feel some degree of gratification at the problem of anastigmatism with a flat field having been solved by one of their countrymen, by the adoption of means other than those employed by German mathematical opticians.



A "Cooke Lens"—for by this name it is to be known—having by Messrs. Taylor, Taylor, & Hobson been submitted for critical examination, we are enabled, after due trials, to give a brief report of it. In the first place, this particular specimen is small, and is externally characterised by that mechanical neatness and finish associated with the work of this firm. The front lens, which is double convex, is mounted in close proximity to a biconcave lens of compound formation, the separation space between the two being but small. Each of these two—the separated front and the central—nearly balance each other in visual power, so that, when looking through the pair, the net result is nearly akin to looking through plain glass with a tendency to diminishing. The back lens, a double convex, has its aberrations corrected and its focus slightly lengthened by those in front. Its diameter, one inch, exceeds that of the others. The glass is singularly free from colour, and no air bubbles are to be seen in the glass. The equivalent focus is 4·92 in.; it has an iris diaphragm, and it purports to cover $4\frac{1}{4} \times 3\frac{1}{4}$.

In trying the lens, circumstances compelled us to use it, at the time, in a 5×4 camera. Messrs. Taylor & Hobson may accept an assurance that the lens does them no discredit, when tackling this size, although larger than was bargained for. The defining power is really excellent, no astigmatism or flare is perceptible, and the field is flat. It works quickly, quite holding its own in this respect when tested against modern foreign lenses of the same relative aperture, when measured by our English method, although such Continental objectives purport to have a larger angular aperture, owing to the German and English methods not yet being assimilated, a task it would well become the Royal Photographic Society to get brought about. Let us hope that a commission will be appointed for such a laudable purpose.

The Tower Bridge.

Mr. Richard Ward, of the Victoria Photographic Company, Herne Hill, has, in this photograph, managed to include the Tower itself, showing very distinctly its relation to the bridge. The view is well selected and well photographed.

Hints on Drawing for Process Reproduction.

By Charles J. Vine. London: Lechertier, Barbe, & Co., 60, Regent-street, W.

This little work consists of some half-dozen chapters, written for the information of artists who prepare drawings for phototypic reproduction. Pen-and-ink drawings, scraper-board work, wash drawings, and drawings in oil, are each treated of in relation to their essential requirements by the process man. A final chapter gives some hints on the improvement or touching up of photographs that have to be reproduced. A number of illustrations are given in the *brochure*, which will, no doubt, be found useful by those for whom it is intended. Price 1*s*.

News and Notes.

Mr. A. J. Beaumont, of 6, Scarcroft-road, York, writes: "Having had my attention drawn to Mr. C. M. Hepworth's arc lamp in The British Journal of Photography of September 6, I beg to hand you enclosed circular of my Comme-il-faut arc lamp, which has been on the market since January last, and, so far as the screw and tangent wheel which Mr. Hepworth claims as a novelty, I have employed the same in my original Comme-il-faut lamp, which I am keeping off the market until I can obtain the finest quality carbons, which are of a special shape. The arc striking in my Comme-il-faut lamp is as follows: The thumb screw is raised to about 45 degrees from the horizontal position, and the carbons are placed in the holders. The arc is struck by pressing the thumb screw to its horizontal position again, and is fed just the same as Mr. Hepworth's lamp. It is my intention to fit an automatic feed arrangement for fixed voltages."

Cloud Effects.—"Critic," in the *Journal of the Photographic Society of Philadelphia*, says: "To a casual observer it would seem that the members of the Society have gone mad over lantern slides wherein pronounced cloud effects are the chief features; the more extreme the effect, the greater the seeming appreciation and applause. To point a camera at the sun just hidden by a cloud is no great feat, yet a really truthful and artistic result is seldom obtained *unless* the cloud effect is made subservient to the landscape, each aiding the other and tending to an harmonious whole. Even at sundown the darkest part of a cloud is far more luminous than the brightest part of a landscape, and should be rendered so, or, failing in this, all harmony of values is destroyed. In some much-applauded slides the shadow sides of the clouds were *almost black*, and out of all value with the rest of the picture. We all know that there is a certain amount of luminosity in the atmosphere at sunset—a sort of feeling of light which is so charming and restful. This effect is a marked feature of the works of Millet, and is striven for by others of lesser note. The absence of this in a photograph, or, in fact, any pictorial representation of nature, is a killing defect, and relegates to mediocrity any effort, no matter how exquisite the technique. Loud and garish effects, even in nature, are seldom artistic, and it requires the genius of a Turner to photograph cloud effects in a natural and harmonious manner."

Artistic Display Competition, 1895.—Report and Awards.—The widespread interest manifested in the above Competition has shown clearly that only a little encouragement is necessary to bring out the spirit of emulation among the members of the printers' craft. The number of specimens received amounts to 155, a number far exceeding that of any known competition of a similar character either at home or abroad. The specimens are very diversified in style and character, and show that in many instances considerable taste, skill, and ingenuity have been exercised in their production. We have every reason to be satisfied with the result, which far exceeds our most sanguine expectations, and have much pleasure in announcing the awards, which are as follows: 1st prize, *The Spook*, W. S. Wilson, with R. E. Thomas & Co., 24, White-street, E.C. 2nd prize, "O P Q," W. S. Wilson, with R. E. Thomas & Co., 24, White-street, E.C. 3rd prize, "No. 234," S. B. Lupton, printer, Parliament-street, Harrogate.—The Meisenbach Company, Limited, Photo-engravers, West Norwood. Judges: Mr. Robert Grayson (the *British Printer*), Mr. George W. Jones (the *Printing World*), Mr. W. John Stonhill (the *British and Colonial Printer and Stationer*). With a view of affording printers and others interested in the artistic display of advertisements an opportunity of seeing the results of this most successful competition, arrangements have been made for an Exhibition of the specimens to be held at the St. Bride Foundation Institute, Bride-lane, Fleet-street, London, E.C., from September 17 to 28, inclusive.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 16,467.—"Adjustable Tripod Head for Photographic Cameras." J. Lawton.—*Dated September*, 1895.

No. 16,516.—"Improvements in the Production of Coloured Photographs." H. S. Fearon.—*Dated September*, 1895.

No. 16,517.—"An Improved Optical Apparatus to Facilitate the Drawing and Colouring of Landscape and other Pictures." H. S. Fearon.—*Dated September*, 1895.

No. 16,548.—"Photography in Colours." F. W. Lanchester. *Dated September*, 1895.

No. 16,603.—"Improvements in Dark-room Lamps used in the Manipulation of Photographic Sensitive Surfaces and Substances." J. W. Hunter.—*Dated September*, 1895.

No. 16,628.—"Improvements in Spools or Reels for the Winding of Flexible Photographic Film." G. Dickman.—*Dated September*, 1895.

No. 16,640.—"Improvements in Photographic Lenses." H. L. Aldis.—*Dated September*, 1895.

Exchange Column.

*** No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange Griffiths' quarter-plate hand camera, leather-bound rapid rectilinear lens, iris diaphragm, time and instantaneous shutter, three special double dark slides, new last June, for Adams's Ideal hand camera, or one of good make, to carry twelve plates in sheaves.—Address, Henry Francis, 3, Trinity-street Hastings.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
16	Leeds Photo. Society	Members' Lantern Evening.
16	North Middlesex	*Clouds in Negatives and Cloud Combination Printing.* H. Stuart.
16	Richmond	
16	South London	Paper by J. A. Sinclair.
17-21	Ashton-under-Lyne	Exhibition of Pictures by Members.
17	Brixton and Clapham	
17	Gospel Oak	Carbon Demonstration.
17	Hackney	
17	Hastings and St. Leonards	
17	North London	
17	Paisley	
18	Brechin	
18	Bury	
18	Leytonstone	Monthly Meeting to judge Photographs taken during the August Outings.
18	Manchester Camera Club	
18	Photographic Club	
18	Southport	Lantern Night.
18	Southsea	
19	Bradford	*Compressed Gases for Lantern Work.* W. Morton Jackson.
19	Burslem	*Photo-ceramics,* with Demonstration. W. Ethelbert Henry.
19	Glossop Dale	
19	Greenock	
19	Hull	
19	London and Provincial	
19	Oldham	
19	Oxford Camera Club	
20	Cardiff	
20	Croydon Microscopical	Conversational Meeting and Results of Beddington Excursion.
20	Holborn	
20	Leamington	
20	Maidstone	
20	North Kent	
21	Birmingham Photo. Society	Exc.: Coventry. Leader, W. L. J. Orton.
21	Hull	
21	South London	Excursion: Streatham and Tooting Bec. Leader, J. Miller.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 5,—Mr. A. Mackie in the chair.

Messrs. Cowell and Parry were elected members.

Mr. T. E. Freshwater, acting in the Hon. Secretary's absence, read a communication from the Hon. Secretary of the Photographic Club, inviting the members of the London and Provincial to join the Club in their annual outing to Hampstead Heath on Saturday, September 21. Tea at the Bull and Bush at half-past five p.m.

Mr. W. T. Wilkinson had been announced to give a demonstration of the practical working of the collotype process. The press which was necessary to carry out this intention had, by some misunderstanding, not been sent, so that the programme could not be adhered to. Mr. WILKINSON, however, explained the method of getting a leather ink roller into working order, a proceeding which took some months to accomplish. He also showed the proper method of scraping the roller by passing the knife in one direction only, and that with the grain of the leather, stating that the life of the roller was very much shortened by wrongful treatment in this operation.

Mr. BECKETT said that metal plates had been recommended instead of glass. He asked whether they possessed any advantage.

Mr. WILKINSON replied, "None whatever. Both brass and copper plates were liable to buckle in consequence of the variations in temperature to which they had to be subjected. Workers in Birmingham might send them somewhere in the neighbourhood to be flattened, but elsewhere this was a matter of time and expense." Speaking of presses with a leather tympan, he said that brass was preferable, and for collotype work the scraper should be slightly rounded. With the Albion press there was the disadvantage that it was constructed to work only on a plate type high, and that it usually happens that to reach this thickness the plate had to be built up. A method of temporalily cementing two or more plates with this object by means of sheets of paper and varnish was explained.

Mr. W. E. DEBENHAM mentioned that M. Albert was accustomed to use a glazed roller in addition to usual inking roller.

Mr. WILKINSON said the glazed roller played the part of clearing up the higher tints; but a composition roller did the work equally well. The glazed roller consisted of an ordinary roller rolled up with varnish, which was allowed to dry upon it; successive coatings of varnish produced a glossy surface.

In answer to a question, Mr. WILKINSON said that much had been said about rolling up with both thin and thick inks; but, in practice, most collotypers used but one ink, suiting the consistence of the ink to the quality of the plate. With a flat negative there was not sufficient contrast if a thin ink were employed; but, with a negative with too much contrast, a thin ink should be used. The thicker the ink, the greater the contrast produced.

A member asked whether there was any remedy for an over-exposed plate. In reply, Mr. WILKINSON said that a solution of cyanide of potassium was used, which had the effect of dissolving chromated gelatine that had been rendered insoluble by the action of light.

It was suggested that acetic acid or a sulphocyanide might be equally efficacious.

After a vote of thanks to Mr. Wilkinson,

Mr. J. E. HODD said that, with a certain brand of plates, he had been quite unable to prevent frilling until he had hit upon the method of edging the plate with indiarubber solution, and, by means of this treatment, he had entirely overcome the difficulty. He found, subsequently, that edging of ordinary matt varnish acted equally well.

It was announced at the termination of the proceedings that Mr. Wilkinson's demonstration would take place at the next meeting.

PHOTOGRAPHIC CLUB.

SEPTEMBER 4,—Mr. M. L. Troup in the chair.

Mr. SINCLAIR asked for a reason for the mottling on a carbon transparency which he showed.

Mr. FOXLEE said that it was a very exaggerated case of reticulation. He also passed round one on the same tissue which did not show it. He said that one was collodionised and one was not. Answering a further question, he said that a German firm, with which he had been connected, thoroughly cleaned the glass and coated with gelatine and chrome alum. Mr. Foxlee thought that Mr. Sinclair had hardened the substratum too much; also, very hot water favoured reticulation.

Mr. SINCLAIR asked if it was better to allow the collodion to thoroughly dry or only to let it "set."

Mr. FOXLEE said it was better to let it dry. He also said that, when sensitising in hot weather, he preferred an old bath.

Mr. WILMER asked if, after mounting carbon tissue on glass or copper, it was left, say, for an hour or an hour and a half, would a continuating action take place?

Mr. FOXLEE said yes, but not very rapidly at first. If the bichromate was thoroughly removed, then the action would be slower.

Hackney Photographic Society.—September 3, Mr. R. Beckett presiding. Excursion reports were rendered and future announcements made. It was decided that the excursion for Saturday, September 14, should be either to Cobham Park or to Cookham. Members' work was shown by Messrs. A. Barker, Dean, Guest, Newton, Rawlings, and Westcott. In reply to a question, Mr. Rawlings said that, with good negatives, plenty of detail could be obtained on the C.C. platinotype paper, and he thought that clouds could be more easily printed thereon than with the smoother paper. A discussion took place as to the peeling of the film and blistering of matt collodio-chloride paper. Mr. Hudson said that he thought that the collodion was cracked at the edges in cutting before being sent out, and he found it an advantage to trim the prints by means of scissors, and cutting shape before toning. Acting this way, he found the film less liable to peel at the edges than if the trimming of the prints were left until after toning, fixing, and drying. Several members promised to experiment further in the matter. A discussion then was opened as to the advantages of backing plates to prevent halation. As a result, it may be stated that *with* backing, the evidence served to show that halation was prevented; but, *without* backing, halation might, or might not, result. Different makers of plates had different powers of resisting halation: some showed none; others, under similar conditions, showed plenty.

Sheffield Photographic Society.—The monthly meeting was held on the 3rd inst., when the President, Mr. Firth, occupied the chair. Mr. Jas. Leadbeater, of Rotherham, read a paper on *Photo-micrography* in which he referred to the great assistance the microscope has rendered to scientific research, more especially so when used in combination with the camera, the results being more accurate than drawings. Half-plate and 12×10 negatives of such minute objects as a cricket's tongue, bee's sting, &c., were passed round, and the method by which they were produced fully described, the lantern used being one of the lecturer's own manufacture. A number of microscopic slides were thrown on the screen and proved most interesting. A hearty vote of thanks was accorded Mr. Leadbeater for his lecture, which every one enjoyed, and will, no doubt, result in some members taking up this branch of photography. The award in the bi-monthly competition again fell to Mr. J. W. Rayner for a fine view in Whitby Harbour.

FORTHCOMING EXHIBITIONS.

1895.	
Sept. 23	*Leeds. G. Birkett, City Art Gallery, Leeds.
,, 23–28	*Westbourne Park Institute.
,, 24	*Royal Cornwall Polytechnic Society. Edward Kitto, The Observatory, Falmouth.
,, 30–Nov. 2	*Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 30–Nov. 14	*Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
Oct. 28–Nov. 2	*Southport. G. Cross, 15, Cambridge-arcade, Southport.
,, 29–Nov. 1	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.
Nov. 19–21	*Hackney. W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 28–30	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

IMPURE HYPOSULPHITE OF SODA.

To the EDITOR.

SIR,—It would be a mistake to suppose that hypo, as now made, is a by-product. Most, if not all, of that made in this country and on the Continent is produced by the action of sulphurous acid upon a solution of sulphide of sodium. The sulphurous acid, being usually generated from burning pyrites, the resulting hypo may contain as impurities the various constituents of that mineral. Thus I have found some samples of hypo to deposit yellow sulphide of arsenic. This impurity, when present, may be detected by dissolving the hypo in water, and adding, first a drop or two of weak acetic acid, then saturated solution of sulphuretted hydrogen in water. The sulphide of arsenic is formed as a flocculent yellow precipitate.—I am, yours, &c., J. H. PAYNE, F.I.C.

Mexbrough.

ALUMINIUM.

To the EDITOR.

SIR,—I quite agree with your correspondent's recent letter *re* prices of aluminium. That the metal is more difficult to work than brass is true, and also the greater difficulty of soldering would tend to keep the prices higher, but I do not think the high prices of makers are justified. I should like to warn fellow camerists against purchasing fittings of this metal without testing them first. Pure aluminium is very ductile, and is very far from being rigid; it is easily bent, and screws cut in it are easily stripped of their thread. I have used many samples of the metal for various camera fittings, and the best I have had is an alloy of four per cent. of copper. When hard rolled, the rigidity is increased, and it cuts and turns better, but I do not consider it even then comes up to the alloy. For plates—angle and sliding—and for struts, it is much superior to brass, but is better made a little stouter than the latter. I enclose three pieces for inspection—pure, hard rolled, and alloyed with four per cent. of copper. I am surprised it is not more taken up, as it need not be lacquered, and keeps its colour so well.—I am, yours, &c.,

Sutton-place, Devizes, September 9, 1895. G. C. PILE.

A SUGGESTION.

To the EDITOR.

SIR,—From the quality of many of the new illustrated weeklies, one is apt to infer that the idea of their respective organizers has been a pure mercenary one—taking advantage of the public's growing taste for pictures; and, if some of them don't either "dry up" or pay closer attention to the quality of what they publish, we shall soon see the public taste undergo a reaction.

Occasionally in these papers we find really clever studies by some of our ablest photographers, which often strike me as being somewhat out of place. In one of these weakly weeklies of recent date appears a very beautiful study of a religious character from a photograph by one of the best-known photographers; on the following page is a badly illustrated joke of a type bordering on vulgarity. It is the occasional sight of this kind of thing which has brought to my mind the following suggestion, which still leaves plenty of room for further improvement, and, when properly carried out, would, no doubt, prove a success financially.

Photographers are, or should be, ever on the look out for something new wherewith to vary and improve their work, to keep them or get them above the standing of the second-rate photographer. There will be no second-rate man in time, it will be either the first-class or a very much lower-class man who will succeed in business. Experience has taught us that an interchange of ideas amongst photographers—not necessarily through societies, but mostly through exhibitions—has done much towards mutual improvement in our work; therefore to meet this want a paper (8vo, for instance) might be published weekly or fortnightly, containing nothing but pictures and descriptions connected with the pictures; omit all formulæ, proceedings of societies, notes, &c. Space might be accorded to editorial purposes, and the cover might go for advertisements.

Instead of the usual prize-giving let the publication of one's own work be its own reward, by refusing all pictures which have no artistic value. The blocks might be sent to the photographers.

I think, if all photographers were invited to contribute, more pictures than enough would be forthcoming. Marks might be given for the quality of each picture, and those who obtained the greatest number of marks for a given number of pictures *might* be awarded a gold medal. Many excellent details which would enhance the value of the publication could be added by those more skilled in that direction than I am.

Such a magazine would not clash with any present one, as it would not be bought for news. It would also be an attractive magazine for those outside the profession.—I am, yours, &c., J. W. BEAUFORT.

Birmingham.

THE RISING FRONT *VERSUS* THE SWING BACK.

To the EDITOR.

SIR,—Reading carefully the LANTERN RECORD of this month, I find a very interesting notice from "Radiant" in reference to a most useful new camera, with an indefinite rising front. If I am allowed to express an opinion in regard to it, I would say that I approve very moderately the great superiority of square bellows as against cone bellows. The rising front, with cone bellows, can be used almost as much as with square ones, and the interference of the bellows is about the same, as the square ones may, and do often, sag in the centre, specially when a little outstretched.

As regards the lens, it is quite another matter. If you have a camera to take views of, say, 5×7, the lens usually is one to cover that size, and if you raise the front abnormally—which would be, say, three inches—your lens is of no use, as it should be one covering not 5×7, but 5×10 or 8×10, with a corresponding longer focus, and I think a swing back preferable to an indefinite rising front. For the same reason the rising front was deprecated as necessitating a larger lens, only one-half of it being used, and needing consequently to cover at least twice the size of plate.

I have been taking enough architectural views to know something about them, and the possibilities of rising fronts, swing fronts, square and cone bellows, and swing back. I am satisfied fully with a swing back and cone bellows and sufficient rising fronts, but always use lenses to cover plates one size larger than those exposed.—I am, yours, &c.,

Asnières (Seine), September 8, 1895. A. LÉVY.

ASKEW'S LANTERN BOX.

To the EDITOR.

SIR,—In your issue of August 16, 1895, on page 525 we note that you say "the manufacturing rights of Askew's lantern box, formerly brought out by Messrs. Newton & Co., have been secured by another firm."

This might lead readers to suppose that we no longer have "manufacturing rights," so we shall be much obliged if you will insert a notice to the effect that we *still make* and sell Askew's portable lantern box.—We are, yours, &c., NEWTON & CO.

3, *Fleet-street, Temple Bar, London, September* 7, 1895.

THE BRIGHTON CORPORATION AND CONSUMERS OF ELECTRICITY.

To the EDITOR.

SIR,—As many photographers may be contemplating fitting up their studios this season for electric-light portraiture, it would be advisable before doing so to have some agreement, signed if possible, with the Electric Supply Company or Corporation, or most likely they will find, when too late, their position will be similar to mine at the present time. It perhaps will be best to state the simple facts of my case. Over two years since, I fitted up an installation for "photography" by electric light at a cost of several hundred pounds, engaging a well-known firm to carry on the work. The whole, when finished, was approved of by the Corporation Electrician, and connected with their mains, meters supplied, &c. Things went on smoothly for the above time; but, to my surprise this season, I get a notice from the Corporation Town Clerk, stating unless I adopt the three-wire system, "which means another outlay of 20*l.* for rewiring the premises," they have power to cut off my supply; and, in fact, the electrician put in so small a fuse, that made it impossible to use the arc light. As few consumers wade through the Electric Lighting Act before falling into this trap, it seems the power is entirely in their hands, and consumers are at their mercy. To give up using the light after spending money on the installation is out of the question, so the game is a poor joke for photographers.

An extract from the Electric Lighting Act: "Before any installation can be connected to the Corporation mains, it must be approved and tested to the satisfaction of the Corporation's officers."

This in my case was done, and, after two years, I am compelled to adopt another system, the "three-wire method," which means using electricity through more resistent coils, and double cost on the demand bill. I may state, for the gratification of photographers generally, the number of sitters taken by the electric light has not been sufficiently good to pay the interest on the outlay; it has been more an "advertisement" than any substantial benefit.

The whole thing becomes a white elephant. In an interview I had with a member of the Lighting Committee here, he owned they would rather be without photographers' arc lamps; they were a positive loss. But this comes under the "queer side of things," in the nineteenth century, too!—I am, yours, &c., P. C. MORA.

Western-road, Brighton.

LEYTONSTONE CAMERA CLUB EXHIBITION, NOV. 28-30, 1895.

To the EDITOR.

SIR,—Will you you be good enough to make known through your paper that Messrs. Lyonel Clark, A. Horsley Hinton, and John A Hodges have kindly consented to act as Judges at our forthcoming Exhibition.

Entry forms &c., will be forwarded as soon as possible, but, owing to

the number of applications for same, I am unable to reply to each one individually.—I am, yours, &c., B. HARWOOD *Hon. Sec.*

September 5, 1895.

EXHIBITION AT HAMBURG.

To the EDITOR.

SIR,—At the request of Herr Ernst Juhl, President of the Society of Amateur Photographers of Hamburg, I have the pleasure to invite the work of British exhibitors for their Exhibition, which will be held in October next. There are no charges for wall space, and no entry forms or prospectuses, neither are any awards given. Every exhibitor, however, whose pictures are accepted by the Jury of Selection receives the Society's medal of honour. The closing day for exhibits is October 10, and the particulars for catalogue September 30. The address for all communications is Herr Ernst Juhl, Kunsthalle, but I shall be pleased to give any information required from the usual address, 59 and 60, Chancery-lane, W.C.—I am, yours, &c., WALTER D. WELFORD.

Amsterdam, September 7, 1895.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

PHOTOGRAPHS REGISTERED :—

The Victoria Photographic Company, Milkwood-road, Herne Hill.—*View including the Tower and Tower Bridge.*

A. H. De'Ath, Bank-street, Ashford, Kent.—*Portrait of James Niven, Captain of the Ashford United Football Club.*

W. J.—Send us the letter in a stamped envelope, and we will post it on to the gentleman.

A. J.—We are much interested in your experiments, and shall be pleased to receive the sample solutions for trial.

F. MILLER.—We know of no contrivance such as you mention at present on the market, and it might therefore be worth your while to introduce it.

W. N.—We are unable to say what is wrong, as it is not stated how the chloride of gold was made, or how the alloy in the scrap gold was got rid of, if at all. If it was not, that may be the cause of the trouble.

HERBERT GUNSTON.—You are using an unusually acid sample of chloride of gold. There is no objection whatever to the addition of a little bicarbonate of soda. Indeed it is, in your case, decidedly advantageous to do so.

SKYLARK.—Any good brand of plates will do quite well for the work; but, whatever kind is used, they should be backed to avoid halation, as the subjects are such as will be prone to give that in a somewhat enhanced degree unless precautions are taken to prevent it.

T. ROWBOTTOM.—As only a few ounces of the nitrate of silver are required, it will be found much more economical to purchase it than to make it. Although metallic silver is so very cheap now, the price of the nitrate is proportionately low. The price of the metal regulates that of the nitrate.

H. C. (York).—The only thing to do is to employ an extremely wide-angle lens, in which case the perspective must, of course, be very violent. From what we remember of the Minster, we think it will be impossible to get a lens to include what is required from the only standpoint that seems to be available.

WEYMOUTH.—The pictures are very good as photographs, but we cannot say the same from a pictorial point of view. We are afraid you will not be very successful in finding a purchaser for the negatives amongst any of the principal publishing houses, supposing, of course, that those sent are representative of the others.

R. & Co.—Whatever your assistant may say to the contrary, the negatives are not properly washed. The portions sent are highly charged with the hyposulphite. There is little wonder that the negatives stain while printing, even if they are varnished. More complete elimination of the hyposulphites in future will avoid the trouble.

T. JARVIS.—It seems that the paper is at fault, for, if the same negatives yield good prints with B.'s paper, they should do the same with another brand. Those sent on A.'s paper are certainly very bad, while the others are good. The latter paper seems to be deficient in silver, for, on exposing it to light for a long time, it does not take a deep colour, while the other, in the same time, bronzes strongly.

A. JAMES.—The form of studio, as we understand it, is very good. There is no need to cover the side light with tissue paper unless it is desired to stop out the view from the windows. The side blinds or curtains may be white or light blue, and the top ones dark blue or green. It will be as well to stop out all light below the part marked "3." In so short a studio you will find it an advantage to have two lenses, one for cabinets and another for *cartes*.

OPALINE.—Spot the prints when they are dry. Albumen prints must be mounted with gelatine or starch to make them adhere to the glass. A weak solution of gelatine will suffice, such a one as will set to a rather weak jelly when cold. No precise proportions can be given without knowing the gelatine in use. Use thin glue for cementing on the backs. If you cannot otherwise avoid air bubbles when developing the negatives, use a camel's-hair brush to remove them.

Mr. J. C. MUIR inquires for particulars of the developer used by Mr. Paul Lange, of the Liverpool Amateur Photographic Association.—We cannot say, but no doubt Mr. Lange will kindly enlighten our correspondent.

G. ROSS.—Any of the well-known antis ptics will prevent starch paste from becoming "putrid," though not from, to an extent, decomposing. If starch be used as a mountant for photographs, it should be used freshly made, instead of antiseptics being relied upon. What is simpler that to make a little fresh starch when some is required for mounting purposes? We do not know the composition of the cement named, so cannot, therefore, give any opinion as to "the effect it may have on photographs in after-years."

SWISS says: "1. Will you kindly inform me where I can obtain a regular supply of a leading Swiss photographic journal, circulating principally in the northern cantons or in the city of Bâle, and proper to enlighten me as to the condition of the professional trade in that country? 2. Can you inform me as to the prospects of an eventual establishment in that country?"—In reply: 1. The only Swiss photographic journal we know of is *The Revue Suisse de Photographie*, published at Geneva. 2. Sorry we are not in a position to offer an opinion.

S. C G.—We strongly suspect that nothing will be recovered from the Post Office for the broken negative, notwithstanding that the package was marked "fragile." Breakable articles must be reasonably protected, and a glass plate—the negative—simply enclosed between two boards, and tied together with string, certainly was not safely packed. Indeed, the surprise would have been if it had passed through the post without being smashed. The firm did what is usual under such circumstances, refused to receive the parcel in its damaged state. They thus relieved themselves from any responsibility in the matter.

THOS. PINDER writes: "I should be pleased to know how to transfer photographs on to furniture, tables, sideboards, &c., to have the appearance of inlaid work, the photograph to be made transparent to show the grain of the wood underneath (mahogany, walnut, &c.), and to allow of the furniture being French-polished without injuring the photographs."—The carbon process will be suitable. The image must be developed on a flexible support, and then transferred to the wood, which has previously been prepared with gelatine, to which a little chrome alum is added. Of course, the grain of the wood will only show through the transparent and semi-transparent portions of the picture.

FRANCO says: "Will you oblige me with answers to the following queries:—1. The names of some French photographic journals devoted to professionals, that is to say, in which I can see advertisements of retouchers, &c.; also where I can obtain any of these papers? 2. Wishing to start a business (photographic) over in France, in your opinion could a person with a good knowledge of professional work in all its branches stand a better chance at making it pay than in England, where it is so overcrowded? I am accustomed to speak French, and have lived there a good deal. Your opinion would oblige, however, as, if I thought it would not answer, I would have to try England."—In reply: 1. Roughly speaking, there are no French journals "devoted to professionals." You had better advertise in *Le Moniteur de Photographie*, 55, Quai des Grands Augustins, Paris; or the *Photo-Gazette*, 3, Rue Racine, Paris. 2. We do not think you would stand a better chance in France than in this country.

R. H. J. S. writes: "The latter part of my apprenticeship, so far, has been a 'successful failure.' I was bound in July, 1891, for five years, to learn 'the art, trade, and business of a photographer' (as stated in indenture). In July, 1894, I was considered competent in printing, and therefore had the privilege of a retouching desk, but all the spare time I could get to use it was, and is, an average of about one hour per day, sometimes not sitting down to it for a week together, having to resume platinum, carbon, and enlarging work, as well as the toning of P.O.P.'s, as my successor did not make much headway with it, being slow and indifferent. I have continued thus till July, 1895, when he (the silver printer) took to the platinum work. This summer I have worked more than half my time at amateur stuff—developing, printing panorama pictures, scrap-album work, toning and enamelling all the amateur work, and thus I am supposed to be learning 'the art, trade, and business of photography.' I should like your advice as to my learning retouching, of which I only know a little, and operating, having only eleven months left."—This seems to be another of the many unsatisfactory cases of apprenticeship. Our correspondent appears to have been given plenty of experience in the minor branches of the business, but, as is very frequently the case, none in the most important ones. Some employers take apprentices not for the purpose of fulfilling their obligations—teaching the apprentice his trade—but to get their work done for nothing, or for a merely nominal wage. As to the remedy, that is a question for the magistrate, who can order the apprentice to be properly taught, or can cancel the indentures. In a superior court damages can be recovered for the loss of time, &c. Of course, if an apprentice appeals to the law, he will not get a very comfortable time of it with some employers. In the present case a little mild remonstrance will perhaps be sufficient.

CONTENTS.

	PAGE
OUR FORTHCOMING ALMANAC	577
GARDEN AND GREENHOUSE PORTRAITURE	577
FOREIGN AND BRITISH PHOTO-GRAVURE	578
RENDERING THE CARBONATES CAUSTIC FOR DEVELOPMENT	578
JOTTINGS. By COSMOS	580
MECHANICAL AIDS IN PRINT-WASHING. By W. B. BOLTON	581
THE COMING EXHIBITIONS	582
PHOTOGRAPHIC COPYRIGHTS	583
ON PHOTOGRAPHS OF THE MOON TAKEN AT THE PARIS OBSERVATORY	584
HALF-TONE ENGRAVINGS BY THE ENAMEL PROCESS. By ROBERT WHITTET	584
THE MOSELLE: A CONTINENTAL BY-WAY. By AN ITINERANT PHOTOGRAPHER	587
THE LATE MR. B. J. SAYCE	588
OUR EDITORIAL TABLE	588
NEWS AND NOTES	589
RECENT PATENTS	589
EXCHANGE COLUMN	589
MEETINGS OF SOCIETIES	590
FORTHCOMING EXHIBITIONS	590
CORRESPONDENCE	59
ANSWERS TO CORRESPONDENTS	59

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THE ENJOYMENT OF COPYRIGHTS.

Concurrently with the pronouncement of legal judgments on photographic cases adverse to certain publishers' interests, there have appeared what might almost be termed manifestoes from the same quarters to the effect that photographers are ethically to blame for making any money out of copyrights.

It would almost appear like concerted action to influence the public mind prejudicially to photographers, and to create an opinion adverse to the continuance of a copyright Act that includes photographs. To whatever cause may de due the inception of this campaign, it is quite possible that the indicated end may be brought about unless the other side of the question be put fairly on record. We purpose to put dispassionately the publisher's arguments and those of the photographer. But, first, any question of fraudulent demand must be excluded from our purview. If a photographer possess a picture in which no copyright exists, no honest man can excuse him for claiming a fee for use of copyright.

Bearing upon this aspect of the subject is the problem whether the copyright of a picture registered in due form really belongs to the person who registered it. There are so many ways in which this intricate question may be answered, both from moral and legal standpoints, that it will be better to leave it untouched, and pass on to the simple consideration of whether a photographer has any right at all to possess a copyright in a photograph he has taken.

We will first deal with it as affecting a portrait taken and paid for. In such a case the producer cannot possess a copyright unless the sitter, in writing, permits him to have it. It would appear that the sitter, being a free agent, no one ought to have a word to say in the matter, for or against. But, says the publisher's side, "if a few courtesy copies give the sole right to reproduce, why should not the payment for a copy give the right to reproduce?" The answer is simple, There is nothing in the law to prevent any one reproducing an unregistered photograph, and that is felt to be a hardship by photographers.

Next, we are asked, "How is the publisher to know that he has the right to reproduce a copy sent to him?" Equally simple is the reply, By the same means that he would have to adopt if he wished to reproduce a painting or music-hall song, however worthless from a literary point of view—or a metal tip to his boots—by referring to an official registry. If he choose to take the risk rather than go to the trouble, he has only himself to blame if he gets punished for the unauthorised use of the production of other people's brains.

We next have to consider the case of a photographer who takes a view, or a portrait, without payment, gives away a few "courtesy copies," and registers the photograph at Stationers' Hall. Many publishers and editors seem to think this an entirely improper act, and some of them are willing to reproduce a picture on the chance, first, of a legal quibble upsetting any claim for damages; and, next, of the photographer not caring to risk a prosecution of the infringer lest he lose a hundred or two pounds through such quibble going against him. Their point is that a photograph is such a machine-made production that it is absurd, if not immoral, to put a value on any copyright in it, and decidedly wrong to ask a big price if the subject of the photograph should become notorious, and so in demand for illustration purposes through no virtue or effort of its producer. It is not necessary to discuss this latter point. An "unearned increment" attaches to many things besides photographs; and whether it be shares in a gold mine that rise in price, a judicious investment in old books, or the like, the world has decided on the propriety of the ownership of the increment.

Again, an objection is made when payment is asked for use of copyright when the original of the portrait has given a copy to an editor for reproduction in his paper. Surely no editor would publish a portrait without such permission; we should assume that to be a preliminary before treating with the photographer, and, if the latter has taken the original portrait without charging a fee, he is entitled to all the benefit of his production, design, invention, or arrangement, be the photograph looked upon as a piece of mere handicraft, the result of brain work, or the product of a trained intellect. We believe that the public and the publishing minds are so possessed of the idea of "you press the button and we do the rest" that it is found impossible to understand that a man can put in a photograph work that shall separate his pictures by a wide gulf from those by men of no training and no artistic knowledge. We have no desire here to discuss the well-worn question of whether a photograph is a work of art or not; we would merely point out that a man who is an artist, by training or profession, will in his photographs be able to make use of that knowledge and that training and show it in his photographs. To sum up in a few words, the way to make all publishers believe in the ethics of photographic copyright is to uphold the status of photography by producing the highest examples of its capabilities.

THE INTENSIFICATION OF PROCESS NEGATIVES.

In the handling of negatives intended for reproduction by "process," in many respects the treatment differs essentially from that requisite in ordinary half-tone work, and in none more than in intensification. To such an extent is this the case, that even experienced wet-plate workers, in the ordinary way, often find themselves in difficulties, if not altogether at sea, when it comes to a matter of intensifying negatives representing simply black and white. If we turn from wet collodion to any of the emulsion processes, the difficulty is perhaps even more pronounced, as the conditions prevailing in these methods vary materially from those of the wet plate.

If we start with the statement that a process negative, whether intended for pure line work or for half-tone etching or photogravure, should consist only of opaque high lights and clear glass shadows, we have expressed the true state of affairs, for the gradations that exist are, or should be, due entirely to the mechanical breaking up of the image into lines, dots, or grain, by whatever means employed, and the perfection of that gradation depends, in a very great measure, upon the absolute adherence to those conditions, opacity and clearness. In the case of a half-tone negative, on the other hand, perfect clearness of the shadows is a matter that affects the rapidity of printing rather than the final result, and, provided the different gradations are rendered with proportionate values, the shadows may possess a very decided amount of deposit without robbing the negative of its printing qualities. In fact, we think, as a rule, those negatives which exhibit little or no clear glass in the shadows are usually considered the best printers.

It will be seen, then, that the processes or methods which work most satisfactorily for half-tone negatives—we mean negatives in natural half-tone—so far from being equally applicable to "process" requirements, may possibly be, and frequently are, the very reverse, and, in fact, the most unsuitable, the conditions, in short, that favour the production of softness and delicacy of gradation in the ordinary negative being precisely the ones that militate against the crispness and brilliancy of the "process" image, and *vice versâ*.

Thus, to commence at the beginning of the task, the process worker uses an old and ripened collodion and an acid bath; whereas, to obtain the best results in ordinary portrait or landscape work, a tolerably new and slightly coloured collodion is used, and a bath either neutral or very faintly acid. The object in the former case is not, as in the latter, to get out the very faintest radiations from the darkest portions of the object, but rather to hold in check, or keep back, some of the superfluous or abnormal action in those parts. For instance, all who have had any experience in copying fine line work are aware of the difficulty that exists in keeping clear the finer portions of the subject; the coarser lines may stand out sharp and clear, but the finer gradations partake more or less of the character of a pseudo half-tone, produced by the opaque and transparent lines practically merging one into the other, the transparent lines, in fact, being partially filled up by the spreading or thickening of the opaque ones, as well as by, perhaps, a certain amount of general veil impossible to be avoided except by the use of a collodion and bath that would be useless where the highest class of half-tone result was desired.

The filling up of the lines is due to a mixture of several causes, but is mainly a sort of halation—a spreading of the action both of the light and of the developer from those portions of the image where the deposit ought to exist to those which should be clear, and, as a matter of necessity, this effect is the more pronounced in proportion to the delicacy of the subject to be reproduced. Another condition, too, that must be taken into account is the reflection from the surface even of the black lines of the engraving, and, finally, the general veiling, more pronounced in a line reproduction than in a half-tone subject, produced by reflection from the back surface of the glass. As a means of overcoming these difficulties, the first step is practically to take such measures as are calculated to annihilate the very finest gradation of the negative if it were in natural half-tone, or, in other words, to prevent the translation into a visible form of the faintest radiations of light.

If these conditions prevail in connexion with wet plates, they exist in even a more pronounced form when dry collodion is used, partly by reason of the greater transparency of the film in the latter case, and partly also from the different nature of the development. The wet-collodion film, consisting, as it does, chiefly of iodide of silver, with a comparatively small proportion of bromide, is not only dense and, in a measure, opaque to the passage of light rays, but, from the yellow colour of the iodide, it is still further proof against the passage of those rays, either directly through its thickness or laterally by internal reflection from the particles composing the film; but the pure bromide of silver dry-plate film is not only much more transparent, but it lacks the non-actinic colour of the iodide, and, as a consequence, the light passes through it much more readily, and is subject in a far greater degree to reflection, both internally and from the back surface of the glass.

If we add to this the consideration that, from the fact of the dry-plate image being formed by the actual reduction of the silver salt contained in the film, and not, as in the case of a wet plate, by the deposition of silver on the surface, it is not difficult to understand that the defects mentioned in connexion with wet collodion are found to be vastly increased when dry plates are used, for the simple reason that the action of the developer is more directly upon the actual particles of silver salt impressed by light, whether it be direct or by reflection. In the wet plate the action is upon the surface only, whereas in the dry plate it takes place through the whole thickness of the sensitive layer.

Before discussing the question of intensification, therefore, it is evident that such measures should be taken as will present an image that will *bear* intensification—that, in fact, shall not only be free from all visible deposit in those portions that ought to be clear glass, but that shall be also, as far as possible, free from any light influence that may be within the power of the intensifying solution to translate into visible form. To the experienced worker in this particular branch of photography these conditions are not very difficult ones to work to, but to the tyro they may, at first, appear insurmountable, and the first step in the direction of overcoming them will be to altogether throw over all associations connected with half-tone work and to start on the entirely new lines of pure black and white.

Now, we are accustomed in ordinary portrait or landscape work to associate certain conditions, as of bath or collodion, with rapidity or the reverse. Thus, as already stated, a newly iodised collodion and a neutral bath are usually identified with rapidity of exposure, and the reverse conditions with extreme slowness; but, in reality, the actual difference in exposure *in a*

good light may, perhaps, prove to be little, if any, the fact being that acidity of the collodion and bath chiefly, if not altogether, rule the sensitiveness to very feeble radiations of light, and the conditions that would bring about the production of an apparently much under-exposed half-tone negative—because deficient in the very finest details—might have no appreciable effect on the sensitiveness, though much on the character, of the result when applied to mere black-and-white reproductions.

It is easy then, bearing this in mind, to start on a fair basis, with an image that, if it requires it, will bear intensification, and then we are in a position to consider the different methods available.

A New Source of Silver.—We are accustomed to hearing of the presence, and the probability of the economical extraction, of silver in a variety of directions, notably, for example, in sea water, but we were scarcely prepared to hear of the presence of both silver and gold in ordinary bar iron. Yet such is the case, for Mr. H. N. Warren describes the results of an examination of large masses of iron for the purpose of ascertaining the amount of silver and gold they contained. Pieces of iron, four pounds in weight, were treated, so that this is no fancy laboratory work, and the result was an estimation of silver varying from ·8 to ·055 in the carbonaceous residue. As this is only a small percentage of the weight of the metal, it is obvious that there could be no economical extraction of the precious metal (gold also being present), but the fact of their presence is well worth placing on record.

Bursting of a Gas Cylinder.—Another cylinder of oxygen has exploded, but this time from a cause that, up to the present, so far as we can remember, is unique. Last week a fire occurred at the West Bromwich Theatre, which was eventually destroyed. In a portion of the building was a cylinder charged with oxygen. When the fire reached this, the heat expanded the gas, and thus brought about an explosion, which is described as shattering, and bringing down a portion of the wall, at the same time blowing the burning *débris* over the surrounding buildings and setting fire to an adjoining house. The cylinder is said to have been of wrought iron; but, of whatever it was, it would have burst under the conditions in which it was placed. So it would have done had it been charged with air, or even with water. During the pantomime season there are often quite a large number of charged cylinders in theatres, and it would always be a good plan to store them, when out of use, in some place where they will be safe from heat in case of a conflagration. Gas cylinders, of late, have acquired an unenviable notoriety, and it is very undesirable that it should be increased.

A Costly Album.—The Shahzada has left us. We mentioned, at the time when he was more in evidence than he was at the latter period of his stay, that a photographer was to accompany him to take photographs of the places he was to visit. Amongst the presents His Highness takes back with him is a large case containing these photographs, and others, of the places of interest which he visited. The mounting and binding of these photographs alone cost, it is said, nearly five hundred pounds. This costly album is a present from Her Majesty. We are informed that the Shahzada also takes back with him some photographic apparatus, and we know that, while he was here, he was much interested in the art, and even went so far as to insist in making a "snap-shot" or two himself. The young man is said to have a scientific turn of mind, and it is not, therefore, surprising that he should be interested in what he saw here of photography.

Something Worth Knowing.—One frequently meets with extraordinary statements in business announcements. Here is a case in point. We have before us a circular and price-list of an enterprising caterer for amateur photographers in a western suburb, and in it mounts are made a feature of. A speciality seems to be "green cabinet, gold-bevelled edge," for there is a foot note to it which we quote *verbatim* for the edification of our readers: "I have bought an immense stock of these mounts; they are of exceptional quality, *and green is the only colour which does not affect the print sooner or later.*" The italics are ours. We doubt much if the above startling announcement will cause any great rush by experienced photographers, or fairly well-informed amateurs, upon mount makers for this protective (?) tint, or at least, with past experience, on the strength of the above statement. They are not quite so verdant, some suspect.

The Lay Press and Technical Subjects.—An evening contemporary that frequently indulges its readers on scientific and technical matters enlightened them one day last week on the subject of guttapercha. In an editorial column it gravely informed the reader that "guttapercha heated in hot water to about 100 degrees Fahrenheit becomes plastic, and will take fine impressions with slight pressure." It goes on to say that, when it is soaked in benzole or naphtha, it becomes swollen, &c., and winds up with the information that guttapercha "is specially adapted to electrotyping." We fancy it would be as difficult to find any one at the present time that did not know that guttapercha was softened by heat as it would be to produce any manual on electrotypy, published within the last fifty years or more, that did not give this substance as one of the best mounting materials that can be used. It would almost seem that the majority of the lay press that essay to deal with technical matters are those who know least about them.

Photographic Evidence in the Yacht Race.—It has more than once, in these and other columns, been suggested that photography might well be used as a means of deciding racing and similar events. So it might, but only under certain conditions, namely, that the camera be pointed directly in a line with the winning post, but not otherwise. In the recent yacht race in America photography has been much in evidence, both by English and American workers, and, as a matter of course, a large number of negatives have been secured. These, taken at the moment of the collision which led up to the fiasco, are cited as proving that each vessel was in the right, and, on the contrary, that each was in the wrong. The correspondent of the *Standard*, writing on the divergent opinions on the matter, says, "Even the photographs taken at the instant the boom struck the shroud differ, one showing that there was room for an ocean steamer to pass between the mark boat and the *Valkyrie*, while another shows the *Valkyrie* almost close enough to leap from it to the mark boat." This is not at all surprising when the different pictures were taken from different standpoints.

Frilling in Gelatine Negatives.—As a remedy for this, a member of one of the societies, at a recent meeting, mentioned that, with a certain brand of plate, he could not get on until he adopted the method of edging the plates with indiarubber solution, or with matt varnish. This had proved a perfect remedy. As equally good a remedy, in our hands, is to rub a paraffin candle round the edges of the plate. The paraffin is highly repellent of water, and thoroughly protects the edges of the film from its action. In hot weather, if the plates have any tendency to frill, this will be found a simple safeguard, and it is extremely easy of application. If we have occasion to intensify or reduce a negative after it has been dried, we almost invariably rub round the edges of it with a piece of paraffin wax to avoid all risk of frilling.

Reticulation in Gelatine Films.—At one of the late meetings of the Photographic Club a carbon print was shown that was badly reticulated, and a discussion ensued upon it. Dirt has been described as simply matter in the wrong place, and reticulation may as well be described as a valuable property in gelatine films in the wrong place, when it occurs in carbon prints or in negatives.

Reticulation may be described as incipient frilling, or a puckering up of the film, and is the basis of the collotype process. The collotype grain is simply a reticulation of the film, which at one time was a great trouble in the carbon process. The skilful collotyper is, of course, able to modify the fineness, or coarseness, of this "grain" or reticulation at will. Here we have a familiar example of what may be a bane in one process, yet is the most valuable property in another process of photography.

JOTTINGS.

THE size of hat I usually wear is $6\frac{7}{8}$. By a notable coincidence this is also the size of a cap which, with some adroitness, was last week flung into the air by "G. D.," an editorial contributor to *Photography*. The cap fits me perfectly, and I will wear it a while.

"G. D." is dissatisfied with the criticisms of photographic Exhibitions, and complains that they are often entrusted to those who happen to be routine workers on the staffs of the papers—dabblers in the chemistry or optics of our subject—without much critical perception for pictorial qualities, and without practical experience in art production. He pleads for criticism of the higher class, discriminating of the motive, aim, and feeling of the artist. He also favours the demand for artist criticism, and is of opinion that the principal autumn Exhibitions deserve a more knowing art criticism than the photographic journals as a rule publish; also, the criticism seems too often done by one who never produces any picture whatever that is in danger of being hung; and so on, and so on.

I am sure that the foregoing sentiments will be shared by a quite considerable number of photographers. I know of at least three who will hail with delight the opportunity "G. D." has given them of agreeing with him. That the editor or proprietor of a newspaper should entrust the task of reviewing a collection of photographs to a man who knows something about chemistry and optics, upon the laws and applications of which the preparation of most photographs to some extent relies, is a proceeding against which a disciple of the new movement is entitled to protest, while few will gainsay "G. D.'s" contention, granting that "pictorial quality" is only to be found in such works as the photographic critics have hitherto failed to appreciate, that a more "knowing" (!) art criticism than the photographic journals usually publish is urgently needed.

Dissatisfaction has been termed the root of progress, and I for one devoutly hope that "G. D.'s" search after the criticism of the higher class will be satisfied to the full. But artist critics of the style of Mr. W. F. Yeames, R.A., who, at the Camera Club Conference a couple of years back, said some unkind and pungent things about the sham and shoddy "pictures" that photography is sometimes seduced into producing, would naturally not be welcomed by these yearners after comments that lead to "a current of true and fresh ideas," and equally so they would not be over-eager to have their creations passed under notice by accomplished painter critics like "Palette," who, at pages 719 and 737 of this JOURNAL for 1893, wrote dispassionately, but by the light of great critical powers and judgment, about the first Salon Exhibition. "G. D.," of course, does not plead for *these* kinds of criticism.

No, he "requires a critic who can place himself in the position of the artist, enter into his feelings, and see his meaning"—a critic who, when standing before a blurred and formless mass of light and shadow printed on a rough fabric, would not commit the vulgar mistake of insisting that what purported to be a study of sheep in a lane really looked like a piece of a dirty and demoralised blanket set in a green frame, but would ecstatically see in it a pastoral poem, instinct with subtle tonality, breadth of effect, and feeling! He wants a critic who can see soul and sentiment in a smudge, beauty in a blur, and art in astigmatographs. He wants a critic who would see in what is photographically known as fog, "atmosphere," in over-printing or over-exposure, "harmonious effects," in under-exposure, "decision of treatment," in poverty of subject, "simplicity of theme"—in short, a critic who would and could only see in bad photography "art!"

But, pending the arrival of this automaton critic, made to order, I suppose "G. D." and his fellow-mourners will have to rest content with the criticisms of the unsympathetic dabblers in chemistry or optics, just as the British public, which occasionally works itself up into a rage over the costliness and incompetence of its civil servants, soon settles down again into a placid toleration of things as they are. In the mean while, why do not "G. D." and those who look with such contempt on the critical deliverances of the dabblers in chemistry or optics occasionally club together and engage the services of a tame art critic to "place himself in the position of the artists, enter into their feelings, and see their meaning?" If my suggestion is adopted, I would respectfully urge that the man be paid by the job, and not by the hour; otherwise, from my recollection of certain "art" productions shown last year in Piccadilly, it would turn out to be a long and costly affair. Then, failing this plan, is there not *The Amateur Photographer*, a charming paper, the editor of which keeps an art critic on hand for the special instruction and improvement of those photographers who sigh after a "knowing" criticism?

"G. D.'s" next objection to the critics is that they are "dominated by a few fixed elementary standards, and judge year by year accordingly." "There is," says he, "the good old standard of brilliancy, up to which every picture must be brought, no matter what the subject;" and then, in proof of this, not the least exaggerated of many exaggerated statements, he goes on to say: "As an example, we may quote the sapient critic who writes of a tree-study, 'It is scarcely forcible enough in the scale of gradation for our taste.' My readers may be interested to know that this "sapient criticism" appeared in this JOURNAL's review of last year's Salon. The sentence looks to me as if the writer meant to gently characterise the particular "picture" as a weak and wishy-washy one; but, whether he did or did not, "G. D." fails to make it clear that gradation and brilliancy are convertible terms, and, in his succeeding observation that "such critics as these are utterly incapable of recognising any truth of effect in representations which are at all new and original in selection," obviously courts the retort that "truth of effect" and "newness and originality in selection" are phrases to which a variety of plausible meanings may be attached, as he makes very plain in his next sentence, where he pathetically complains that "a quiet evening effect, natural and truthful, is to them a 'flat smudge.'"

I reproduce "G. D.'s" next two paragraphs in their entirety, because directly and by inference they politely hold me up as a marvel of journalistic depravity:—

"Unfortunately, too, criticism is very greatly log-rolling. It lacks honesty as wells as knowledge. It is just as much log-rolling when the criticism is trimmed for policy or friendship as it is when it is shaped to please or purchase advertisers, or to keep in with the proprietors of the papers. As an example of such prejudiced and unreliable criticism we would object strongly to such disingenuous use as that recently made by an anonymous paragraphist in a photographic contemporary of a criticism written in the *Studio* upon Mr. George Clausen's painting. The writer of the paragraph in question addresses himself to young would-be artist photographers, and attempts to use George Clausen's example and influence to bolster up one of his frequent outcries against want of definition in art work. He says the mystical, the weird, the vague, do not lie within the province of photography, as though these qualities or effects were not met with in nature, and were inconsistent with simplicity and fidelity in representation. The idea of making use of Clausen's name to decry vagueness of definition is amusing to those who know anything of his work. There is, indeed, no vagueness of impression or suggestion, for the suggestion is most forcible; but the fuzziness or blurriness of much of his work is of the most marked order.

Either the anonymous writer sins through ignorance or is not more scrupulous in his methods than he is refined in his language. On the very next page of the *Studio* to that quoted from, the critic must have seen the reproduction of Mr. Clausen's picture, *The Mowers*, from which, as a text, a fair homily could be read on the useful application of the very broadest treatment in definition and even of astigmatic effect."

I need only trouble myself about one of the various strange accusations levelled against me in the above extract, and that is the one which says that I "attempted to use George Clausen's example and influence to bolster up one of his [my] frequent outcries against want of definition in art work." This is a misstatement. I simply quoted from an article by Mr. Dewey Bates on George Clausen and his work some sentences in favour of simplicity of theme and fidelity of representation. I myself made no reference to Clausen, with whose work I am only slightly familiar; but I may remark that Mr. Bates's observations might just as well have been applied to the work of Leader, William Stott, Stanhope Forbes, Boughton (I am quoting quite at random), or anybody else without affecting their photographic appositeness, and that is why I reproduced them. For the rest, I congratulate "G. D." on the success of his evident determination to brand me guilty of breaking the critical decalogue.

When a man takes up his pen and selects art in photography as his theme, we are not, as a rule, too censorious of his utterances, and he is usually allowed to unburden himself of a fair amount of ridiculous nonsense without incurring reproach. But "G. D.'s" theory, that because a man dabbles in photographic chemistry and optics he is therefore incapable of entering into the aims and feelings of a brother photographer, is not more grotesque than the kindred suggestion would be that a writer on art is an untrustworthy paragraphist when taking optics and chemistry as his themes, which, if tenable, would possibly discount the interest and value of some excellent *résumés* of the progress of photographic science that periodically appear in the *American Amateur* and the *Journal of the Photo-Club* (Paris) over the signature of Mr. George Davison. As to the supplication that a "higher" kind of critic should be turned on to gratify and pander to the conceited whims of three or four gentlemen whose wild and grotesque burlesques of the capabilities of photography have only succeede in eliciting the contempt of artists, the scorn of art critics, and the laughter of photographers, the most charitable thing I can say of it is that I refuse to believe it is seriously made. But, still, even "G. D.," like lesser journalistic luminaries, has, I suppose, "to keep in" (his own phrase) with the proprietors of papers, which, being admitted, leaves no further mystery as to why this very entertaining article was written.

In reference to my remarks last week on a baby "free portrait" scheme, inaugurated by a South London photographer, I have received the following communication from M. A. Jarchy, artist photographer, of 45, Union-road, Rotherhithe, S.E.:—

"Will you kindly have the enclosed inserted in your next 'Jottings,' so as to clear my name from the dreadful accusation made in the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY, page 580? I have the pleasure in referring you to the undermentioned gentlemen, where I have been previously employed as operator and retoucher:—In Paris: MM. Eug. Piron, Ladrey, Benque, and Pannelier; in Plymouth: Messrs. Heath & Co.; in London: Mr. Walery (Ostrorog), Regent-street."

This is what M. Jarchy says:—

"I presume the gentleman who wrote from the south of London is one of those 'pirate' photographers in my neighbourhood who describes himself as the Greatest London Photographer, and whose business is carried on by the system of 'half-a-crown all round the year,' and who has not the knowledge of understanding how a good artist can conduct his business in offering free photographs to introduce his work without being paid. My scheme of giving 1000 portraits away is without any intentions of selling a frame. My idea is to organize a baby and photographic show in the district Town Hall, whereby my name and work will be advertised. Up to the present time I can produce over 400 baby portraits, which have been given free of charge to mothers who engaged themselves to bring their babies and their portraits to the Town Hall on the day arranged for the show. I have obtained their signatures and testimonials, and I can safely say they are highly delighted with my work, given to them free of charge. To make the show appear attractive, I considered it advisable that each of those free portraits should be exhibited in a uniform frame, and the sample of such a frame is submitted to every mother before the photograph is taken, giving them the option to buy the frame where they like as long as it is of the same pattern, or of purchasing one of me. The frames, highly finished, with a leather case and stand, are supplied by Messrs. Porter & Co., of Aldersgate-street. If you will only refer to the *South Bermondsey Recorder*, which I am sending, you will find an account of my high-standing character and my abilities in art. My object is specially directed to obtain re-orders from those parents to whom the free photographs have been presented, and I have already succeeded in getting eight re-orders out of every twenty free photographs. This, I find, is the only way to struggle against the cheap photographic factories, which infest the whole neighbourhood with the all-round half-a-crown work, and it is the duty of every 'real' photographer to try to clear out the parasites or pirates of the art.

"A. L. JARCHY."

The extract from the local paper is of a highly eulogistic nature, and should make M. Jarchy feel proud. M. Jarchy, in the letter reproduced above, says that he gives the mothers the option of buying the frames where they like; but Mr. W. Hill writes to the *Southwark Recorder*, stating that M. Jarchy informed him that he could not have the (free) photograph without buying the frame off him (M. Jarchy), and also that the latter told the same to other witnesses. I have only one observation to make in conclusion, which is, that in allowing this conflict of testimony to remain uncleared up M. Jarchy is doing himself an injustice far greater than that which any one of his opponents has fastened upon him. COSMOS.

THE GENESIS OF A RESIDUE JAR.

THE illustration appended represents a most useful utensil that I have designed and had in use for some time; it is referred to in an article over my signature in the current BRITISH JOURNAL PHOTOGRAPHIC ALMANAC. For more than a score of years I have used a form of collector resembling in form the glass precipitating jar, with wide base and sloping sides, sold by the dealers in chemical apparatus. *En passant*, I may say that this glass vessel is most useful for precipitating gold in. The base is about twice the diameter of the mouth, thus giving an outward slope to the sides, causing even the finest precipitate to fall entirely upon the bottom, and so rendering it so much more readily collected than when, as in the ordinary beaker, the sides have to be washed down to gather together the whole of the deposit. So with the larger residue vessels, which are made of oak and hooped with iron, and when well constructed and supplied with a pair of side handles for easy moving will last almost a lifetime, if occasionally painted or black varnished. I have only quite recently put one aside which had been in daily use for nearly thirty years. It might be thought that so good a thing could not be improved; but it so happened that I desired to increase the number of these precipitating jars in use, and the question arose: "Could they not be improved upon?" One disadvantage they had was, that the precipitate naturally collected in the groove or channel formed at the junction of sides and bottom, and whenever the vessels were emptied for gathering together the precipitates, much time was lost in getting away the last trace, and similarly with the oak bottom itself; it was not sufficiently smooth to part with all the valuable "mud" that would cling to it.

It occurred to me that a similar jar made of Doulton ware would be an improvement in every way. Further thoughts led to an important alteration of design—making the jar of such a form that there would be no channel for the precipitate to lodge in. I decided to have the bottom of the jar saucer-shaped, and the sides starting from it in a gradual upward curve. This gave a typically perfect precipitate collector; but still, as I was aware that the bulk of the

solutions dealt with by the photographer is greatly beyond the requirements of those of an analytical laboratory, the objection arose in my mind that the handling of a twelve or fourteen gallon jar of this stoneware would be awkward and liable to lead to disaster. It should be noted that these various forms have a provision in the form of a spigot for running off the supernatant fluid when the silver has been thrown down, the spigot hole being made some inches above the surface of the possible layer of precipitate, that there should be no danger of the outflow carrying any portion of it away. When this liquid was to be run off, the vessel would be thoroughly shaken, the argentous deposit well mingled with the remaining solution, the vessel tilted, and the creamy liquid finally poured into a suitable vessel, to be afterwards collected on a filter and dried. It was evident that some different provision must be devised for removing the deposit without tilting the jar. After making a number of sketches of sundry expedients, and having one or two jars made by Messrs. Doulton in accordance, the final shape of the vessel was arrived at, as here illustrated. It will be observed that, an inch or two below the tap, and with its lower portion level with the floor of the jar, is a rather wide orifice closed with an earthenware screw plug, made to fit tight with an indiarubber washer. The jar would, when in use, be kept on a raised stool or bench, and, when it was desired to collect the chlorides or sulphides, it would be only necessary to place a suitable receptacle under the orifice, unscrew the plug, and receive the precipitate, which might be swept forward easily by a small brush or split cane.



In the course of the manufacture of the trial jars, the difficulty arose that some one had actually almost exactly copied the conformation of my original vessel in wood and registered the design in earthenware. Of course, the legality of such a registration could not be upheld if it came into a court of law; but the thing was not worth that trouble, and the pottery-makers did not care to risk an infringement. Hence, to protect myself against further appropriation of my ideas to my detriment, I was compelled to register this new form. This I did, and put it into the hands of Messrs. Houghton to deal with commercially as they thought best.

G. Watmough Webster, F.C.S.

PHOTOGRAPHY IN THE CHINO-JAPANESE WAR.

[Shashin Hinpiokwai.]

Representing Messrs. Ogura, Murayama, and other members of the Photographic Staff of the War Department, I shall speak briefly about the first founding of the Photographic Staff to be sent to war, and their works in the war.

Last year, as soon as the Imperial declaration of war had been made, the Surveying Department of the War Department decided to arrange a complete Photographic Staff for the occasion, and, as it seemed that the military authorities would order a part of the Photographic Staff to set off at once with the First Army Corps, we were ready and waiting for orders. But at this stage of the war, for some reason, the Government decided not to permit any to go to the war except the men in actual fighting service. We were all disappointed, and all the preparations seemed to be in vain. In all Korean conflicts, and on the Yellow Sea, on land and on water, our country was constantly victorious. At this time the Second Army Corps was prepared to take the field; his Imperial Majesty's headquarters were removed to Hiroshima, where all military movements were decided on. At this time, and without warning, we received a telegram from headquarters to send to Hiroshima a Photographic Staff, consisting of not more than ten persons. The preparations had to be hurriedly made, and we took only 12 × 10, and a cabinet outfit, with all necessaries for developing, printing, &c. The Staff was nine in number, Messrs. Ogura, Murayama, Tabuchi, Yenuma, myself, and four coolies, hurried to Hiroshima. Thence we expected to be sent off along with Second Army Corps. There were many difficulties, of which the first and greater was that, as photography is not recognised as a department of an army in the field, it was that photography was considered by military men, with a few exceptions, as a matter of no importance in time of war, being merely an amusement. Besides, only a few knew that we constituted a Photographic Staff of the army; most took us to be a party of professionals. However, this last-mentioned misunderstanding gradually melted away, and the importance of photography in connexion with war was at last recognised.

Although the first transportation of the Second Army Corps took place in the three days from 17th to 19th October of last year, the transportation of Staff was put off until the 23rd of the same month, when the second transportation took place, and on the 28th we arrived and landed at Hwayuan-kow, China, where we met the Army Commanding Department. From this Department we received what it was necessary to carry along with us, namely, one day's supply of uncooked rice, three days' supply of ready-made food, blankets to protect from the cold, a tent, some waterproof paper, and three meals besides. All these provisions, with the photographic apparatus, were, of course, too heavy for our four coolies to carry, so we made an application to the Commanding Department for four track waggons and eight extra coolies. Our application was favourably received, and at last we had all convenience for movements.

Getting two days in the front of the Commanding Department, we started from Hwayuan-kow, and at Hishikwa we came up with the First Division, and had the pleasure to be present at the engagements at Kinchow and Port Arthur. After this, we were attached to the Second Army Corps, and forwarded towards Weihai-wei. During all our movements, we kept our equipment as light as possible, by carrying nothing besides the apparatus actually needed for photography. We penetrated into the actual engagements, where we were under showers of bullets. We regret that, in spite of making all possible efforts, the results are not so good as we had hoped. The reason is that we had only one camera, 12 × 10 size, to be relied upon, and nearly all of the engagements were in the early morning, before dawn, and the durations were so short that they were finished before the break of day. Besides this, the strong wind and feeble light during the severe cold season were a great source of trouble, which very often compelled us to be satisfied to take a very limited portion of space. After the capture of Port Arthur, I made a proposal to the Headquarters for a further extension of the staff, and sent Mr. Ogura back to Japan to prepare another photographic outfit for 12 × 10, so as that could divide the Photographic Staff into two parties. But we were too late, for the day when Mr. Ogura came back to China with the new outfit, and arrived at the Commanding Department, was the day when the Chinese Northern Squadron surrendered, and some time before that Weihai-wei had been totally reduced.

I wish to say a few words about the development of negatives and printing during that time. The difficulties we found in these two manipulations were greater than we had ever dreamed of. The exposures were made in feeble light—in most cases quick exposures being, of course, necessary—and development was carried out in a room severely cold with imperfect apparatus, so, in the case of shutter exposures, two to three hours were occupied in development. During this time the developer froze into ice, as we had not much fuel to keep the room properly warm. All daytime was occupied by us taking pictures and printing, so that we were compelled to develop and tone in the evenings, and not seldom we worked through the whole night. As to printing, many hours were needed in the poor light we had. Moreover, it was very difficult to obtain any pure water, or even nearly pure water. To get water we had to send some miles up the mountain, or to melt ice from the neighbouring ponds. The water froze very rapidly, so that at times manipulations were almost altogether beyond our control. In some cases, the prints after toning and fixing, being spread out to dry, froze, small grains of ice forming all over them; and this in spite of the room being warmed as much as we could warm it. In short, the effect of cold climate resulted in such difficulties as we have never imagined.

On the other hand, one thing very convenient was the dark room. We added a dark tent to our equipment, but used it only twice—once at Hwayuan-kow, and once at Kindiow. Ordinary Chinese houses are made of stone or brick, and to each room there is only a small window, and half the room has no flooring, and these we made drains for waste water. By shutting the window, and hanging a blanket at the entrance, we had

a quite comfortable dark room, or rather the Chinese houses are dark rooms in themselves.

What I have described is a few of the experiments we met with during the war. Concerning details, I hope the two experts, Messrs. Ogura and Murayama, will write to you at some future time.

In any case, though we got no good result, it may be worth while to make it generally known that our army had a regular staff of photographers, organized to make photographs during actual battle. The fact will testify to the progress of the photographic art in our country, and will have record of this historical war, for all times.

SHYOZABARO TOTANI.

CRITICS.

[St. Louis and Canadian Photographer.]

IT seems easy to criticise photographic productions. You have only to put a lot of work on exhibition, whether by amateurs or professionals, and critics spring up promptly to have their say. One says the whole display is fine, everything lovely, excellent in execution and artistic to an allspice. Another does not find a redeeming quality in the display. The work of one man is too weak, another too strong. One has too much foreground, another not enough. The photographers have no taste, or they would have selected the points of view the said critic would have advised. Had they consulted him, a very different result would have been produced. But, alas! they had not asked his advice, and of course the result is a complete failure. Now, it might be well to ask what some of these critics know about photography, any way. Somebody must be wrong. One finds fault with the landscape by showing how much more artistic the picture would have been if the stream had been wider, the trees in a different position, and more clouds in the sky. Now, it is doubtful whether it would have paid the photographer to have gone to the expense of having the stream widened, or the trees moved, or to have waited a week for the clouds to get just right to suit the critical critic. Just as well find fault with one of Walter D. Welford's street beggars because the poor tramp's clothes are not cut in the latest fashion, and bag at the knee or —elsewhere. The photographing mortal is compelled to take stream, tree, and clouds as they are. I have my doubts as to the said critic's ability to improve on nature to any considerable extent. Some of them, without doubt, could supply nature with wind, should she find herself short of that whistling commodity. I do not think some of them are capable of furnishing much of anything else. One good thing about their criticisms is, they do not hurt much, as they fall dead and are not worth an autopsy. Critics and others may as well understand the fact that, in making photographs, many things combine to produce a success, and many things beyond control tend to injure the production. The man does not live who can always produce exactly what he desired in every instance. The circumstances under which a picture is taken should always be considered. Unavoidable circumstances sometimes absolutely prevent success. A man trying to get a view at the bottom of the ocean might have his work spoiled by a passing whale just at the moment of exposure, or a shark, some eight feet long, might show a disposition to be too familiar just at this critical time, in which case the resulting picture might show the effect of a hurried exposure. Of the why and wherefore the operator is aware, while the critic is nowhere in his estimate of the picture. No doubt the operator meant to secure a picture of great depth in tone, and without the presence of the time-worn studio accessories. He must have felt a strong desire to rise above his surroundings on that occasion, anxious for exaltation; he knew success depended on a short exposure, self-exertion, and careful manipulation, and was well aware that future developments would reveal the success or failure of his experiment. Whether the picture should show an upstart sponge, shells of the ocean, or an under-exposed coral reef, was a matter of little or no consequence to him in such an emergency. He probably had deep objections to attempting a resitting, and was willing to waive all the critics might say. Other instances might be mentioned where an operator is exposed to formidable, certainly undesirable, molestations not mentioned in the latest "Book of Instructions for Beginners." The fact is, a man cannot always hold possession of the point his judgment had selected. A short-horned Durham bull in a pasture lot has lifted the operator above all responsibility as to foreground or background. The man was only too glad to stand on any safe ground, regardless of what surface-view critics might take of the situation so hastily accepted. A waiting bulldog or a slip in the mud has been the cause of changing a man's entire course of procedure, or causing him to reverse carefully planned intention. A competent operator has his reasons for making a picture as he did. They may not appear to you or me. Therefore, Mr. Critic, do not be too severe in your denunciation of a picture until you know what formidable surroundings attended the execution of it. Some headstrong, lawless members of the "varmint" kingdom, armed with fin or arrayed in fur, like some humans, have yet to learn that they are under the moral obligation of allowing others to pursue their pleasure or fire their cameras unmolested. Put yourself in his place, Mr. Critic, and you will see more than your spectacles enable you to behold on that 4 × 6 piece of paper.

Sometimes a fresh amateur has not been content until he has exposed his plate on three different objects, and then gives the man developing them a piece of his mind (small) because three of his best shots are developed into such a jumble. Skill (!), money, plates, and time wasted. on this world there is sometimes a difference of opinion as to who is to blame for spoiled work. It is most always the other fellow.

Reading an extract from an English publication in your July number reminds me of an instance remembered in my experience. I had a negative of an aged, well-known clergyman of New York, who had just died. He was the paster of a large congregation, a man beloved and respected, always welcomed at the sick-bed, and ready with consolation for the afflicted. I also had the picture of a noted pugilist and prize-fighter, who had been killed in a brawl by an opposing gang. Pictures of both were offered for sale during the same montb. I received seven or eight dollars for pictures of the grand old man, and sold upwards of fifty dollars' worth of the bruiser. No accounting for tastes in cosmopolitan New York.

Photographic literature continues to abound, some of it within uncut edges. Some writers give us every-day sense in plain language; others, to give vent to their feelings and to show their vast knowledge, mystify their communications with as many long, hard words as they can command, and sometimes coin words they do not know the meaning of themselves, no doubt thinking they exemplify profound learning, and suppose the reader will stand amazed at the amount of incomprehensible wisdom they condescend to portion out.

ABRAHAM BOGARDUS.

COLOUR PHOTOGRAPHY.

[Springfield Republican.]

THE Session of the Physics Section of the American Association for the Advancement of Science, yesterday (September 2), was undoubtedly the most interesting of the whole meeting so far, but by far the most popular, and one of the most valuable, of all the papers presented, was that of F. E. Ives, on *The Reproduction of Colours by Photography*, which occupied the afternoon. Mr. Ives has produced wonderfully good results by his method, and those who saw the photographs which he threw upon the screen were astonished at the beauty of the colouring, and the accuracy of reproduction which he has obtained in photographing nature. A large number of spectators had been drawn to Evangelist Hall by the announcement of the subject, and they lingered long after the paper was finished, looking at the pictures which Mr. Ives exhibited. The most wonderful were the pictures of the glorious scenery in Yellowstone Park, with its wealth of colouring, no whit of which was lost in its reproduction by photography. The rich brown of the Geyser minerals, the azure of the pools, the green of the foliage, all were brought out with a truthfulness which surpasses the art of the painter, with nothing raw or crude about it. It was not a picture that spectators looked at, it was the real object.

This was shown even more strikingly in the photo-chromoscope. With this, by looking through a double eyepiece something like a stereoscope, you see the photograph of the object before you in its exact colours, but so accurate is it that you can hardly be persuaded that you are not looking directly at the object itself.

Following is an abstract of Mr. Ives's paper:—

"Three methods of reproducing the natural colours by photography are now attracting public notice, One is a direct process in the camera, known as the Lippmann process. Another is a composite process in which photography produces a record of colour in monochrome, which record is afterwards translated into colour again, either optically or by superposed colour prints; this is represented by the photo-chromoscope and the natural-colour lantern slides of Ives. The third, known as the Joly process, is based upon the same fundamental principles as the photo-chromoscope method of Ives, but is an attempt to arrive at the result by a short cut.

"The Lippmann process is based upon the theory that, if the light which forms the image passes through the sensitive film to a perfect mirror which is in contact with it, the reflected rays, encountering the direct rays, produce the phenomena of interference within the film, the waves of light propagating in opposite directions causing the vibrations at certain intervals to be neutralised, while at others they are intensified, with the result that the photographic image is made up of strata of black silver deposit separated by clear spaces, the separation of the strata

everywhere depending upon the wave-length of light acting in that part of the film. At the critical angle such a photograph will reflect light the colour of which depends upon the thickness and separation of the silver lamina, as the colours of the soap bubble depend upon the thickness of the soap film. In practice, a 'structural' film of bromide of silver in gelatine or albumen is used, backed with mercury. Very long exposures are necessary. Although thousands of exposures have been made within the past three years, I believe not more than one dozen good photographs of coloured objects have been obtained, and, in some of these, June foliage reproduced with all the variegated tints of autumn. It has been proved that this process can be made to produce all the colours of the rainbow by the action of monochromatic light, by simply varying the exposure; and this and other facts make it appear extremely doubtful if the results ever are, or can be, in strict accordance with Lippmann's theory.

"The photo-chromoscope system is based upon the established fact that all other colours can be reproduced to the eye by mixtures of three spectrum colours—red, green, and blue violet. Three negatives are made, each by the joint action of the respective spectrum colour, and all others into which it must enter in the reproduction, and in due proportion, as indicated by physical laboratory measurements of colour mixtures. This is accomplished by making the exposures through selective colour screens, adjusted to yield photographs of the spectrum having density curves like the curves of a diagram showing in what proportion the respective primary colours must enter into the mixtures representing the other colours in the spectrum. Such a set of negatives of any object constitutes a record of the colours of that object, and a positive from this negative record can at any time be translated in colour by triple lantern projection or in the photo-chromoscope. In the triple lantern the record for red is projected with red light, the record for green with green light, and the record for blue-violet with blue-violet light; the images are superposed on the screen, and these three colours are then found to be mixed in such proportions as to reproduce every colour and every gradation of light and shade shown by the object photographed. In practice, the complete colour record is now made on a single sensitive plate at one exposure, and the translation of the record in colour is most readily accomplished in the photo-chromoscope, a small table instrument not much larger than a hand stereoscope. In this instrument one appears to see, not a picture, but the object itself. Permanent colour prints can also be made from the photo-chromoscope negatives, lantern slides or machine prints on paper, but the production of such prints involves complications and compromises which add to the difficulties and cost of carrying out the process, and subtract from the quality of the results.

"Joly, in place of three separate colour screens, employs one parti-coloured screen, which may be described as a mosaic of the three screens of the photo-chromoscope system. Such a screen, made up of narrow strips of red, green, and blue colour, when removed so far from the eye that the lines are not separately perceived, shows no colour, but a uniform grey tint, which may be made to appear white under certain conditions of illumination. Theoretically, a single photographic image, when made through a suitable selective parti-coloured screen, and then viewed through another (somewhat different) parti-coloured screen, properly registered, should show the same results that are seen in the photo-chromoscope. In practice, very serious difficulties are encountered. With parti-coloured screens of 300 lines to the inch, which I believe is much finer than they can be made really perfect, though not fine enough to permit of using the pictures successfully in the stereoscope, a lateral movement of 1-600 of an inch of the screen upon the photographic positive will change a pure red to purple or yellow in the reproduction. Used as lantern slides, under conditions which approximately fulfil theoretical requirements as to colour reproduction, at least five times as much light is required to project them as to project the colour-print lantern slides made from photo-chromoscope negatives; and the colour lines showing up separately give the effect of a coloured picture on ribbed paper."

HALF-TONE ENGRAVINGS BY THE ENAMEL PROCESS.*

Features of a Good Negative.—It is to be hoped that the result of so much labour, necessitating so much careful handling and the exercise of so much judgment, will be a good negative. If it is not satisfactory, it will be but labour lost to proceed further, and it will be well at this point to describe what constitutes a good negative. Give it a minute examination under the glass. The darkest portions of the negative, which will be the high lights in the finished picture, should present a small, clear, transparent dot. The effect of the intensification should have been to close up the black dots which, after development, almost touched. If there are cross lines of white instead of the small dot, the high lights in the finished picture will be correspondingly dark, and the whole effect will lack contrast and pluck. The black dots in the half-tones should vary in size down to the very small in the deeper shadows, and where strong contrast is wanted they may in some portions be down to nothing. Should the finished negative not present these features, it were better, in the spirit of *nil desperandum*, to throw it aside and begin again at the beginning, hoping for "better luck next next time."

The Marginal Line.—The resulting negative proving satisfactory, the further operations may be proceeded with, and the next, unless a vignetted effect is wanted, a marginal line should be run round the picture, giving it a finished appearance, and affording a guide for the router in mounting. With a square or straight edge laid along the margin of the picture, run the point of a graver along; this will make a clean cut through the film, which will print black in the finished picture.

Turning the Film.—The film has now to be prepared for turning, otherwise the picture would appear reversed in the after-printing. Though to turn it is by no means a difficult operation, it requires delicate handling, and is most interesting. To enable its being so turned it is first given a coating of indiarubber dissolved in benzole, made as follows: Cut half an ounce of pure virgin rubber into small pieces, and place in a bottle with about eight ounces of benzole, giving it a good shake occasionally. In a few days it will dissolve. It should be about the same consistency as good collodion, and if found too thick it may be thinned by the addition of more benzole. It must not be too thin, however, otherwise it will not be sufficient to resist the action of the collodion which is to be afterward applied and which would eat away and destroy the film. After the benzole has evaporated and left the rubber in a thin layer dry over the film; it must be flowed over in the same manner with "stripping" collodion, made after the following recipe:—

Alcohol	4 ounces.
Pyroxyline	60 grains.
Sulphuric ether	4 ounces.
Castor oil	30 drops.

The castor oil is added to make the film adhere to the glass after being turned. It is ready for turning any time after the collodion has set and dried.

At this stage the film should be cut through with a sharp knife about a quarter of an inch from the line marking the margin of the picture. It is now to be placed in a solution of acetic acid, of quantity sufficient to cover well, and proportioned as follows:—

Acetic acid	1 ounce.
Water	8 ounces.

In a few minutes the film at the outer edges will readily be picked away by raising it at the corner with a penknife. After stripping away the outer portion, and leaving only the picture on the glass, put under the tap and wash well, but carefully, and lay on a table, with plenty of water upon it. Now take a piece of stout common printing paper, somewhat larger than the picture and within the size of the glass; wet it by drawing it through water, and lay it over the film; next squeegee the water from it till smooth, raise the corner, and with the point of a penknife pick up the corner of the film, just enough to catch hold of it between the finger and thumb, keeping the paper for support, and gently pull both together from the glass. It will readily come away. Lay it down upon the glass, film up, and smooth out gently with the squeegee, or the point of the fingers, any wrinkles that may have come on it. If the wrinkles are numerous, or the film too delicate to handle with the squeegee or the fingers, a gentle flow of water will expedite the operation, being cautious, however, not to flow so sharply as to float it off. Now draw another piece of paper through water, and lay it over the film, squeegee again, and lifting both papers, having the film between them, from the glass, turn right over, and remove the first piece of paper, which will now be uppermost. The film may now be lifted with its paper support and set aside, and the glass thoroughly cleaned under the tap. So cleaned, lay the glass on the table with plenty of water, lay the film, with its paper support uppermost, in the centre, and squeegee the water from it. The paper may now be lifted and the film examined and smoothed out gently with the squeegee and the paper replaced over it. With two or three layers of blotting-paper over it, it should be placed under a board and a weight for about half an hour, when it may be taken out and set aside to dry.

Preparations for Etching.—The negative is now ready for being printed from, and the student's attention will now be directed to the preparation of the metal plate for etching. This may be either of zinc or copper, the choice being determined by circumstances, it may be, of economy or otherwise. It has been maintained by many excellent operators, especially in England, that one metal is as good as another, so far as the final results are concerned; but an examination of the work in America will satisfy an unprejudiced scrutiny that finer effects have been obtained on copper. It is possible that different ideas of what constitutes excellence in an engraving may account for the preference. It will be noticed that the American

* Continued from page 587.

workman seeks after strong contrasts of light and shade, and, not content with that which his negative can supply, has recently resorted to putting the strong lights in with the graver, and by rubbing down the dots has strained after deeper blacks in the shadows. Our cousins on the other side evidently seek after softness of general effect, and by their writings on the subject show that they esteem this as the acme of attainment. Whichever metal is chosen, however, it must be perfectly polished. It may be purchased in several grades of preparation, rough, machine-polished, or highly buffed. We think it the best economy to get at least machine-polished, and we will assume that it has been so procured.

Polishing the Metal.—If the metal chosen be zinc, it may be brought to a good polish under charcoal and water, but with copper it is necessary to give it a fine grain with emery and charcoal and water, and lastly with charcoal and water alone. In polishing on either metal, let the rubbing be done all one way, to and fro, not in circles or across. After a partial polish, it is well to put it for a few minutes into a strong lye, to overcome any greasiness; and the hands should be perfectly clean, and the fingers not allowed to touch the polished surface of the plate for the same reason.

The Enamelling Solution.—The plate being well polished, it is now ready to receive the enamelling solution. For this there are various formulæ, each supposed to have merits of its own, and hedged around with all the importance of mysterious secrecy; but the basis of all is a glue or gum, preferably Le Page's fish glue, which is now specially refined and clarified for the purpose, while the sensitising element is the bichromate of ammonia. To these most operators add a proportion of albumen, and the varying proportions of these ingredients constitute the virtues of the so-called secrets. Some, however, discard albumen; and, as the presence of this prevents the keeping quality of the solution, it should only be made up in small quantities for early use, or not more than will suffice for a week or two's work. That made without albumen may be made up in larger quantities, as it will keep indefinitely; but it necessitates more careful washing out after development, the albumen, when used, washing out more readily. We give both formulæ, that the operator may take whichever, after practical experiment, he is most successful with:—

Le Page's clarified fish glue	2 ounces.
Bichromate of ammonia	120 grains.
Albumen	2 ounces.
Water	6 ,,

The whites of four eggs of medium size will yield the above quantity of albumen, which take, carefully excluding the yelk and the germ, and thoroughly beat up and set aside to settle. Grind the bichromate with the water, mix with the glue and add the albumen, and beat up the whole again. A common domestic egg-beater is very suitable for this purpose. Make the mixture up in non-actinic or feeble light, and set aside for several hours, when it should be filtered through a small piece of fine sponge in a large funnel, and put into a stock bottle, and again filtered in the same manner before using.

The formula without albumen is as follows:—

Clarified fish glue	3½ ounces.
Bichromate of ammonia	80 grains.
Water	10 ounces.

The directions for making given above will apply equally to this. They should be tested with litmus paper, and will more than likely be found acid. Neutralise with a few drops of concentrated ammonia.

Sensitising the Metal Plate.—The plate having been cleaned and polished, let water from the tap freely flow over it, and, slightly draining the surplus, pour a portion of the solution on at the upper right-hand corner, when it will sweep the water from before it. The solution will have been filtered through a sponge and convenient at hand in a graduate. Flow a second and a third time. Let the surplus at the first flowing run into the sink; if that of the succeeding flowings is thought worth the saving, do not catch them in the graduate from which the solution was poured, but in some other, because so doing will cause air bubbles to form, which will be sure to cause trouble afterward. At the last flowing retain enough to flow back over the plate, and, keeping it in a level position, put it into the "whirler," and whirl, at first with a slow motion, and gradually increasing in rapidity for a minute or so, when it should be examined for any specks or air bubbles that may appear on the film. If there are any seen, it is a misfortune; should they be air bubbles, they may be pricked with a needle, and in the after-flowing they will disappear; but, if they arise from dust, the easiest way is to polish over again and begin from the bottom. These specks are sometimes unaccountably troublesome, and may result from acidity of the solution, so that it is well to prove it with litmus that it is in a neutral condition; if from air bubbles, the best preventive is to keep the point of the funnel through which the solution is filtered resting on the bottom of the graduate; if they are from dust, it is obvious that the room requires sweeping out, or even the floor mopped and washed out, and to remember that cleanliness is an essential to success. If there are no such manifestations, flow again with the solution, and this time let the whirler be so arranged that a gentle heat may be applied, so it may be dried as quickly as possible. This may be conveniently done by holding the whirler over a gas stove, or other cleanly heat, and whirl in the same manner as before, which should take about three minutes. Care must be taken, however, not to expose to extreme heat—indeed the less the better—otherwise the albumen may become coagulated, in which condition it would not wash out in development. The plate may now be set aside to cool, and others coated and sensitised, or made ready for printing. Of course, the coating of the plate, it will be understood, is to be done in the dark room, or with subdued light, and until time of printing set in a dark cupboard or other receptacle.

The Whirler.—The whirler may be of any form that will impart to the plate a rapid circular motion, the idea being to obtain by centrifugal action a perfectly equal distribution of the solution over the plate. Perhaps the simplest form of whirler we have ever known being used was that of a cord suspended over the stove, and twisted till the strain, on being relieved, gave the desired motion, on the principle of an old-time cook's roasting jack. Such make-shifts, however, should only be resorted to by the genius who finds himself in a corner, and, nothing daunted, is determined never to stick. We give in the following diagrams the forms of two of the most frequently used. The working of the first will be readily understood from the drawing; that of the other we may describe as being made of hard wood, the long arms of thin hickory about $18 \times 4 \times \frac{1}{4}$ inch, round which is placed a broad rubber band. Being of such thin material, the arms will spring out to suit almost all-size plates within its capacity. The plate is held within its capacity. The plate is held within grooves at the extreme end, or, what is better, by small screws placed on the outer edge, the heads of which, holding the plate outside, allow the solution to flow uninterruptedly away under the motion. [A diagram explains how the motion is imparted, and it is also seen that this form of whirler is very convenient for holding in the hand over the heat, and at the same time whirled rapidly by the small handle at the upper end.]

Preparations for Printing.—The plate is now ready for printing. To this end let the thick plate glass of the printing frame be seen to as being thoroughly clean; also the negative. Frequently moisture will collect on the glass of the negative, to obviate which let it be held over the gas stove for a few seconds. As to the printing frame, it is scarcely necessary to describe it more than in a general way, that it is a square frame about four inches deep, in which is placed a piece of plate glass of from three-quarters to an inch in thickness, of sufficient strength to withstand the pressure necessary to secure complete contact between the negative and the metal plate. This pressure is got from screws. The frame must be purchased any way, and its construction and working will be readily understood when practically examined.

Loading the Printing Frames.—Take the sensitised metal plate and rest on the points of the fingers of the left hand, and place the negative over it so as the picture will fall exactly in the centre; or lay the negative in the printing frame, film side up, and lay the sensitised plate over it. Let this be done gently and without moving about, so as to save any risk of abrading the film of the negative. Turn over and convey to the printing frame; place over them one or two pieces of felt; put on the cover, and proceed to screw down. This must be done very carefully so as not to break the negative. The safest way is to bring a gentle pressure to bear upon the centre screw, and on the others radiating from the centre, and lastly on the corners, repeating this gently, always beginning at the centre, and going over the others until close contact between the negative and the plate is obtained.

The Printing.—The plate is now ready for exposure, with a view to printing; and here judgment and experience, the outcome of experiment, must be the best guide of the student. There are two elements on which he will have to bring his judgment to bear: first, The density of the negative, and, secondly, the intensity of the light. It may take anywhere from one to ten minutes. If a bright sun is out, and the negative of medium density, one minute may be ample, varying with a cloudy sky or a hazy atmosphere. A few practical experiments and the waste of a few plates will afford better lessons than any written words can convey, and knowledge will come as the reward of patient perseverance.

Development.—Having given what is deemed to be a sufficient exposure, remove the printing frame into the dark room, unscrew and take out the plate, and place in a dish of slightly warm water, and rock for a few minutes. At this point it may be examined as to whether a correct

exposure has been given. If so, the enamelling solution will be found a little tough when raised by the finger nail at any of the margins. If the time given has been too short, it will have washed away under the action of the water, especially when placed under the tap to wash out, which should now be done. If correctly timed, it will stand considerable washing without injury. The effect will have been to wash out those parts of the solution which have been protected from the light by the denser portions of the negative, and the half-tones in varying proportions.

Drying after Development.—Having been sufficiently washed, the drying may be accomplished by being set aside and allowed to dry spontaneously, or, as the manner of some is, to reach the end more expeditiously, the plate may be flowed over with alcohol, and, held in tongs or pincers, a flame set to it, when it will be dried at once and be ready for the next operation, which is the burning in.

Burning in.—This operation is best performed over a small gas stove, and requires a pair of large pincers, about twelve inches long, with broad point that will hold a good grip of the plate by the margin of the picture. It must be kept moving over the flame to and fro, so as to distribute the heat gradually and regularly over all the plate. In a few minutes it will be seen to change colour, and the picture to develop out more plainly. At this point it is safer to lay aside for a few minutes to partially cool, as a great heat too quickly brought to bear upon the enamel may cause it to crack; meanwhile, other plates may be proceeded with, and brought to the same stage. The burning should be continued until it assumes a rich deep brown, when it should be laid aside to cool gradually, when it is ready for the etching.

Corrections on Film.—Specks and other imperfections will now probably make their appearance, which had before been unsuspected, brought to light by the burning in of the enamel. The plate should therefore be examined under the magnifying glass and these corrected with a fine graver. They will appear most injuriously in the high lights, and the remedy is to trim away the film between, and so relieve the dots. This is rather a delicate operation and takes careful handling.

The Etching Fluid.—The etching fluid for copper is a solution of perchloride of iron. It is advisable to use it at full strength at first, gradually diluting. It is a curious fact that the strength of the solution is to a certain extent increased by the addition of water. Make up sufficient to cover the plate well, but not so deeply as to prevent seeing its action in etching. A serious objection to using the fluid full strength is, that it is so opaque as to prevent the process of etching being observed and watched.

The Etching.—Pour the solution of chloride of iron into a shallow dish, and insert the copper plate. The action of the iron will be at once seen in a change of colour, resulting from the accumulation of sediment from corrosion. Brush this off with a soft camel's-hair brush, and do so with a light circular motion rather than broad sweeps over the plate. Do so every half-minute or so, when it is seen to accumulate over the plate. Occasionally blow the liquid from some part of the surface and keep a keen watch whether any of the dots show signs of etching away, when it must be at once stopped. Should the enamel give way too readily under the etching, it was probably too acid, or the exposure under the printing frame had been too short, or the burning in not carried far enough. It may etch deep enough in five minutes to print well, but it is better, for giving greater ease in making ready at press and better printing results, to give a deeper etch, and, if the enamel does not show signs of giving way, fifteen minutes may not be too long to give it. The progress and depth may be examined by the finger nail upon the margin, and stopped when it is judged far enough, then taken out and brushed well with the camel's-hair brush under the tap, then dried by gentle heat over the stove.

Enamelling the Zinc.—Should zinc be the metal chosen to work with, nitric acid is employed in etching. Zinc plates, ready-polished and prepared for engraving purposes, may be obtained, and it is greatly preferable to so purchase them than undertake the labour and trouble of polishing. It must, however, get a final polish with engravers' charcoal before flowing with the enamel solution; and, to eradicate any greasiness on the surface, it may be placed for a few minutes in the lye used for cleaning the glass plates, and then giving the final polish. The process of flowing the plate with the enamel solution is exactly similar to that described above for copper; but, in burning in, the zinc, being a much softer metal, will not stand the amount of heat that copper does, and so the enamel cannot be burned to so deep a colour, and therefore greater caution is required to burn to a degree sufficiently hard and yet not bring the zinc to the melting point.

Etching on Zinc.—A very weak solution of nitric acid is all that is necessary in etching half-tone work on zinc. A solution of one drachm acid to ten ounces of water, which will to taste be about the strength of vinegar, will be found right. It is usual to use a rocking tub, in which the plate is placed and the solution flowed over from end to end, while the oxidised zinc is gently brushed away; it may be done quite as well, however, in a small porcelain or other flat dish as with the copper plate, and the same watchfulness of the film under the action of the acid must be exercised.

Recapitulation.—We might here rest our description of the process; but it will be desirable to recapitulate shortly the various stages and restate the different formulæ, so as to save reference to the larger treatise and present the whole in succinct form.

1st. The Glass.—To be procured flat, clear, and without scratches or blows.

Steep in strong lye for several hours and wash out.

Steep in solution of nitric acid and water. Unless the washing water is very clear, rinse in distilled or filtered ice water.

2nd. Albumenise the Glass.

Formula.

The white of one egg in forty-eight ounces distilled or ice water.

Filter three or four times till perfectly clear. Set on rack to dry facing one way.

3rd. Collodionise the Glass Plate.

Formula for Collodion.

Alcohol, 95 per cent	8 ounces.
Iodide of ammonia	48 grains.
Iodide of cadmium	24 ,,
Bromide of cadmium	16 ,,
Pyroxyline	120 ,,
Sulphuric ether	8 ounces.

Dissolve the salts by trituration in a mortar, each separately in a portion of the alcohol; add the pyroxyline and let soak a few minutes; lastly, add the ether, shake well, and set aside to ripen for about a day.

4th. Sensitise the Plate.

Formula for Silver Bath.

Nitrate of silver	40 grains,
Pure distilled or purified ice water	1 ounce,

of sufficient quantity to fill the holder. Neutralise with concentrated ammonia, and stand in the sun to purify; then filter. When thoroughly clear, put into holder, add C. P. nitric acid, drop by drop, till blue litmus paper is turned to red. Iodise by allowing a collodionised plate to remain in it over night, when it will be in working order.

Shield the bath from light when inserting the plate.

Five minutes in bath will be enough to sensitise the plate.

Take out, drain, and wipe back of plate with blotting-paper.

Put the plate into the camera-holder, close, and attach to camera.

5th. The Screen will have been carefully cleaned and adjusted in the holder.

To clean, use Paris white or prepared chalk in alcohol, afterward pure water, rubbing dry with an old, soft piece of silk.

6th. The Camera.—See the camera correctly set to suit the size of picture to be copied, and the focus perfectly sharp.

Determine what diaphragms to use, and the exposure with each, beginning with the smallest.

Draw the slide, uncap the lens, and set the clock to strike at end of time given to first stop.

Cap the lens and change stops, giving time of exposure with each.

Having given time determined upon for exposure, cap the lens, close holder, and take to dark room.

7th. The Developer.

Formula for Developer.

Saturated solution of protosulphate of iron	12 ounces.
Acetic acid	2 ,,
Water	24 ,,
Or,	
Photosulphate of iron	1 ounce.
Water	16 ounces.
Acetic acid	2 ,,

Dissolve the protosulphate of iron by trituration in a mortar in the water, add the acetic acid, and filter.

Take the plate from holder and flow with above.

Stop development instantly the detail is seen to be fairly out by washing under the tap.

8th. Fixing the Image.

Formula for Fixing Solution.

Cyanide of potassium	1 ounce.
Water	12 ounces.

Flow the plate with above, when it will be seen instantly to clear up.

Wash well, take into the light, and examine under a magnifying glass The dots in high lights should almost touch; those in deepest shadows should show sufficiently strong to stand clearing down a little, or any fuzziness round their edges cleared away.

9th. Intensification.

Formula for Copper Solution.

Sulphate of copper	25 grains.
Bromide of potassium	15 ,,
Water	1 ounce.

Flow with above solution till bleached white, then wash thoroughly.

Flow with solution of nitrate of silver.

Formula for Silver Solution.

Nitrate of silver	40 grains.
Citric acid	5 ,,
Water	1 ounce.

When seen to be blackened through, wash thoroughly.

10th. Clearing.

Formula for Iodide Solution.

Iodine	40 grains.
Water	4 ounces.
Iodide of potassium	*quant. suff.*

Add the iodide of potassium, a small portion at a time, sufficient to take up or dissolve the iodine.

Of this solution take enough to make three or four ounces of water a deep brandy colour; flow this over the plate two or three times, then wash.

Flow the plate with a *very* weak solution of cyanide of potassium, and wash well.

Formula.

Water	4 ounces.
Cyanide solution prepared for fixing negative ...	1 drachm.

Examine with magnifying glass whether the dots in high lights are clear glass, or black dots in shadows have lost their fuzziness. If not, repeat.

Watch carefully the action of the cyanide, that it is not allowed to go too far.

Flow with a weak solution of nitric acid.

Formula.

Nitric acid	1 drachm.
Water	4 ounces.

Flow with solution of sulphuret of ammonium.

Formula.

Hydrosulphuret of ammonium	4 drachms.
Water	2 ounces.

Wash well and flow again with the nitric acid solution above.

Set aside on rack to dry spontaneously.

After drying, cut marginal line with graver.

11th. Turning the Film.

Formula for Rubber Solution.

Virgin rubber	½ ounce.
Benzole	8 ounces.

This solution should be thinned with benzole to about the consistency of good collodion.

After the rubber solution has dried, flow with turning collodion.

Formula for Turning Collodion.

Alcohol, 95 per cent.	4 ounces.
Pyroxyline	60 grains.
Sulphuric ether	4 ounces.
Castor oil	30 drops.

After quite dry, cut the film through with a sharp knife, about a quarter of an inch from the marginal line.

Place the plate in a solution of acetic acid and let lie for about five minutes.

Formula.

Water	8 ounces.
Acetic acid	1 ounce.

Remove the film outside the cut line.

Wash the film under the tap, gently but thoroughly, and lay on table with plenty of water on surface.

Wet a piece of strong printing paper and lay on film and squeegee.

Pick up corner of film with penknife and lift with paper support, and lay on glass, film up.

Wet another piece of paper and lay on film, and squeegee.

Turn over, take off first sheet of paper, and lay aside.

Wash the glass thoroughly under the tap and lay on table with plenty of water.

Lay the film on centre of glass with paper support over it, and squeegee.

Remove paper and examine for any wrinkles; smooth out and replace paper.

Place two or three pieces of clean blotting-paper over it, and put under a weight for about half an hour, take off the paper, and set aside to dry.

12th. Enamelling the Metal Plate.

Prepare the sensitive solution for enamelling the copper or zinc plate.

Formula for Enamelling Solution.

Le Page's clarified fish glue	2 ounces.
Water	6 ,,
Bichromate of ammonia	120 grains,
Albumen	2 ounces.

Formula for Enamelling Solution without Albumen.

Clarified fish glue	3½ ounces.
Bichromate of ammonia	80 grains.
Water	10 ounces.

Polish the copper plate, first with fine emery, and lastly with charcoal and water alone.

Zinc needs no emery in polishing.

Flow with sensitising solution twice and put in "whirler," and put in motion for about a minute; then flow again with solution, and this time hold over a gentle heat till dry, then set aside in the dark to cool.

13th. Printing the Metal Plate.

Prepare the printing frame, in which lay the negative and plate, lay over them one or two thicknesses of soft felt, then the cover, and screw down.

Begin screwing down with centre screw, gradually going over the whole, the corners last and most gently.

Set in the sun, and expose the time judged needful—one to three minutes; in cloudy weather, from three to twelve minutes, according to density of negative.

Remove from printing frame in dark room and place in lukewarm water; rock for about three minutes and wash thoroughly under the tap.

Set aside to dry spontaneously, or flow over with alcohol and burn dry at once.

14th. Burning the Enamel.

With the plate held in pair of pincers, hold over a gas or other clean burning stove till it comes to a rich dark brown.

15th. Etching.

Formula for Copper.

Solution of perchloride of iron	1 ounce.
Water	6 ounces.

Formula for Zinc.

Nitric acid	1 drachm.
Water	10 ounces.

Place solution in a shallow dish and insert the plate, gently brushing away the oxidation which occurs, with a camel's-hair brush, going over the plate in small circles.

Etch from five to fifteen minutes, carefully watching for any break in the enamel.

For zinc a tub may be used, flowing the solution over the plate by rocking.

Wash well under the tap, and dry somewhat quickly over the gas stove.

Mount on wood, prove on press, and *rejoice at your success!*

Conclusion.—Our task is ended. We have endeavoured to describe the process with the utmost plainness—indeed, so plain that "he who runs

may read;" and, if our directions are attended to with ordinary intelligence and care, there cannot be a doubt but that the result will be a gratifying success. It will only remain to finish the work by mounting on wood, to the height of type, to suit it for printing by the typographic process. To do so, however, will require machinery of an expensive character, and the use of power for its operation; and, unless the student purposes going into the business on an extensive scale, it will be found more economical to engage that this part of the work be done by some electrotyper already possessed of the appliances; but if he has determined on having a perfect outfit, the manufacturers of such machinery will only be too glad to furnish him with reliable data concerning it.

ROBERT WHITTET.

Our Editorial Table.

PHOTO-LITHOGRAPHY.

By GEORGE FRITZ, Vice-Director of the Imperial State Printing Works at Vienna. London: Dawbarn & Ward, Limited.

THIS work is what appears to us to be an admirably executed translation from the original German, by Mr. E. J. Wall, who, on receiving the book for review, was struck with the thoroughly practical manner in which it was written, and thought that an English translation would be acceptable to the large and ever-increasing class of photo-mechanical workers who might not otherwise have an opportunity of reading it in the original. The result of this "thought" is the excellent work now before us.

In the introduction the author devotes a few pages to the theory of printing from stone, showing the fundamental principles on which photo-lithography rests, and in course of it imparts information with which it is necessary every practitioner of this process should be well acquainted. Then follow detailed particulars relative to the various approved methods of carrying on the work, and these, we take occasion to say, ought to be carefully studied by the aspirant after ultimate success. The book is educational in a marked degree, and has our best wishes for its commercial success. Price, 3*s.* 6*d.* net.

ILLUSTRATED CATALOGUE OF ASTRONOMICAL INSTRUMENTS.

By Sir HOWARD GRUBB, F.R.S.

IN the preface to this large and imposing catalogue Sir Howard says that the almost universal adoption of the photographic method for astronomical observations has introduced a totally new set of conditions into the necessary instrumental equipment of observatories where satisfactory results are desired. This has in many cases necessitated the remodelling of the designs of instruments that have been, up to the present time, "standard." It has rarely been found possible to remodel existing instruments to fulfil the new conditions, which are much more exacting than the old, and the best results can only be obtained with those instruments which have been constructed from the very beginning with a view to the special work required of them. Concerning optical glass, it is his hope that some time in the future improvements may be made in the manufacture of optical glass which will render it possible to construct object-glasses that will unite most of the rays of useful refrangibilities, and at the same time prove to be sufficiently permanent to enable its adoption to be recommended; but, even if it were possible to obtain large discs of such glass at the present time, it would not be prudent to recommend the adoption of the same for large-size objectives until the experience of years has proved its permanence. The catalogue, which is of large dimensions, is illustrated with drawings and designs of telescopes, observatories, and the appliances of the astronomer.

WE have received from Messrs. McGhie & Co., St. Vincent-street, Glasgow, a sample packet of "Solar" collodion printing-out paper. This paper is prepared in mauve, light pink, and matt. We have tried it, and find that it prints quickly and tones well.

MESSRS. G. W. WILSON & Co., Aberdeen, have issued a series of comprehensive and well-arranged catalogues of their works, both on paper and as lantern slides. These should be in the hands of every dealer.

News and Notes.

WE are sorry to learn of the death, at Greenock, of Mr. Robert Urie, of Glasgow, one of the oldest photographers in that town. A few years ago he patented a machine for rapidly printing bromide prints.

THE HACKNEY EXHIBITION.—The forms are not yet quite ready, but we are able to notify that the open classes will be: General (no restrictions), unmedalled work; Champion Class; Lantern Class (set of four). Entry fee for first two, 2*s.* 6*d.*; Lantern, 1*s.* each set. The Earl of Crawford has consented to open the Exhibition.

PHOTOGRAPHIC CLUB.—The joint outing of the Photographic Club and the London and Provincial Photographic Association will be held on Saturday afternoon next, the 21st inst., at the Bull and Bush, Hampstead Heath. Tea will be served at six o'clock. Members and friends (whose presence will be welcomed) are asked to advise the Secretary, Mr. Sinclair, 26, Charing Cross-road, W.C., of their intention to be present in order that there may be a sufficiency of tea and toast.

THE "Gem" Dry Plate Company, Limited, of Willesden Green, N.W.—registered on January 17 of this year with a capital of 2000*l.*—has made such excellent progress during their first season that the shareholders have now increased the nominal capital to 5000*l.*, the shares being retained exclusively by the original subscribers. New plate and film machinery is being erected, and more extensive laboratories are being fitted. By the middle of October these alterations will be completed, when the output will fully meet the demand that has been difficult hitherto to supply. The Directors of this progressive Comsany are now Messrs. R. G. and C. H. Modera and Mr. T. E. H. Bullen, who is also the General Manager.

PHOTOGRAPHING A WHALE.—A photographer recently asked Mr. Dickinson's advice at the Thames Police Court under the following circumstances: A few weeks since he photographed a whale that had been captured off Cubitt Town, and a man said, if he could let him have two prints, he would be able to get him a considerable number of orders. Applicant did so, but failed to receive any further commissions. Applicant ascertained that the man, instead of attempting anything in that direction, took the prints to the editor of the *Illustrated London News*, who paid him a guinea for them. On applying to the man for payment, he simply laughed at him, and applicant now wanted to know what he could do. Mr. Dickinson said he could sue the man in the County Court.

MESSRS. RIDDELL & RAE, of 134, St. Vincent-street, Glasgow, write: "Referring to a notice, intimating the retiral of Mr. Andrew Riddell from the firm of Riddell & Rae, dealers in photographic materials, and lanterns and lantern slides, 134, St. Vincent-street, we desire to intimate that the business, in all its departments, will be continued by us in partnership, in the same premises, under the firm of Riddell & Rae. With the large stock which we have on hand, of all the newest requisites and appliances, we are in the best position to execute, with promptness, all orders which may be entrusted to us. We will do everything in our power to give the fullest satisfaction to those who may be kind enough to favour us with their patronage and support." The circular is signed, "John G. Rae, George G. Rae, Riddell & Rae."

A MENAGERIE HORROR.—A Man being Photographed Pounced on by a Lion.—In a menagerie situated on the Cours de Midi, Lyons, a young clerk named Leon Eissette, employed at the Perrache railway station, had the *entrée* and was on very friendly terms with the staff of the show. On September 11 he made up his mind to be photographed in the central lion's cage, and about six o'clock the next morning he went to the menagerie without the knowledge of the proprietor, in order to carry out his intention. He entered the cage, which was, of course, empty, and, while the photographer was getting ready his camera, he approached the neighbouring cage, in which an enormous lion, named Romulus, lay sleeping. He did all he could to excite the animal through the bars, and, while pressing against the partition, inadvertently opened the trap door which separated the two cages. The lion bounded through the opening, and, springing upon the unfortunate clerk, seized his head in its mouth, crushing it terribly. The young fellow must have been killed almost instantaneously. The lion then dragged the body to a corner of the cage, where it crouched upon the corpse. One of the boys employed in the menagerie, awakened by the cries of the photographer, tried to make the lion release its victim, but he only succeeded in infuriating the animal still further. A tamer was at once fetched, and, after great difficulty, he managed to make the lion return to its own cage. It was found that the clerk's head had been completely crunched, and his body was in a terribly mutilated condition. One of his ribs was gone, and his right hip was fearfully lacerated by the lion's claws. The deceased was only twenty-four years of age.

THE SCOTTISH PHOTOGRAPHER AND THE ENGLISH OPERA SINGERS.—A Cockney Yarn.—An English operatic company, whose members recently returned to London after a tour in Scotland, had (the *Daily Telegraph* says) a curious experience in one of the inland towns where a performance was given. It was one of those places where, among certain classes, the animus against theatres is almost as great as the consumption of whisky. As it was the last halt in the tour, the members of the troupe agreed to have themselves photographed, and accordingly went to the local photographer and explained their intention. "Verra weel," replied the Scotsman, "I sall be verra gled to tak yer portrets, for ye seem a douce and respectable set o' leddies and gentlemen." "And as we are artistes," suggested the principal tenor, "and there are a lot of us, perhaps you would see no objection to making some reduction from your usual prices?" "Ertists are ye?" said the photographer. "I dinna ken what that may be, but what dae ye dae, may I speer?" "Oh!" answered the tenor, who fortunately understood the Scottish language, "we are singers." "In the kirk?" queried the camera manipulator. "Oh, no!" replied the other, "we are the opera company who are performing at the theatre." The Scotsman took a step backward, raised his arms into the air, and cried, "Awa with ye! Awa with ye! Ye are the deevil's bairns, ye are, and I wadna photograph ye for naething—I mean, for onything ye waed offer me—no, not for a' the money ye had in a week for playin' Satan's antics on the broads. Ertists ye ea' yersels! Ye are children of the deevil, ye are." And he ordered them out and shut his door against them. This is the reason why no authentic photograph of that opera troupe will be handed down to posterity, for next day the tour ended, and the members dispersed to their homes.

A. H. B. writes: "To show you there is a deal of truth in the article you were good enough to publish in this week's JOURNAL *re* free photographs, I send you a cutting from a local paper: 'Mr. Jarchy's Photograph Frames. To the Editor of the *Southwark Recorder*. 62, Eugenia-road, Rotherhithe. SIR,—Judging by your paragraph *re* 1000 babies, I beg to state that it is a falsehood to say that it is optional to purchase a frame. In fact, he told me that I could not have photograph without I bought a frame off him, and also told the same to other witnesses. I also told Monsieur Jarchy that I could get the frame for 1*s.*, which I can do. What I say is, he ought to put about the frames in advertisement. I said, being in the trade, that I would bring frame as he has, but he again said that I must have one off him for 2*s.* 9*d.*, or have photograph alone for 5*s.*, and not be included in the show. Trusting you will correct this error, yours, &c., W. HILL. [In reference to this matter, we can only say that we have reproduced Mr. Jarchy's representation, and, as a disputed point is raised between his patrons and himself, we must decline to adjudicate thereon.—ED. *S. R.*].'"

THE TELE-PHOTOGRAPH.—The tele-photograph is the name of a new Swedish invention which claims to do for the eye something like what the telephone does for the ear. It is based upon the peculiarity of selenium, that its resistance to the transmission of electricity to a great extent depends upon the strength of the light to which it is exposed. The construction of the tele-photograph is simple enough. A fine point of selenium is made to move in a plane by a mechanical arrangement in such a manner that it, moving within a limited compass of this plane, repeatedly forward and backwards, describes a spiral consisting of very close windings. An electric current passes through the selenium point, and the power of this current will vary according to the light to which the point at any given moment is exposed. The receiver is constructed in a similar manner to the above, except that a very susceptible incandescent light has been substituted for the selenium point. The intensity of this light varies in harmony with the light to which the selenium point is exposed. When the incandescent light is made to move in a similar manner to the movements of the selenium point, it will produce lights and shadows on the plane similar to those through which the selenium point passes in its plane. The despatching apparatus is enclosed in a case, something like a photographic camera, fitted with an objective, which can be so adjusted that the picture of the subject to be tele-photographed is formed in the movement plane of the selenium point. The lights and shadows produced by the incandescent light of the receiving apparatus will then produce a picture identical with the one at the dispatching station. This picture can be made visible in various manners, either through photography or by being directly looked at through some magnifier, or in a similar manner to the one used in a magic lantern. The rapidity of the movements of the selenium point through any one point of the picture must not allow of a greater interval than about one-eighth of a second, so that the corresponding impressions upon the eye of the beholder form a continuous complete picture.—*Engineering*.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 16,810.—' Photographic Enamel." C. P. DOUGLAS.—*Dated September*, 1895.

No. 16,876.—"An Improved Adjustable Support for Photographic Cameras, Surveying and other Instruments and Articles requiring adjustment." F. G. LYNDE.—*Dated September*, 1895.

No. 16,901.—"An Improved Limelight Lantern for Illuminating Purposes,' &c. W. BUTCHER & SON (W. Butcher and W. F. Butcher).—*Dated September*, 1895.

No. 16,902.—"Improvements relating to Stands for Cameras and other Scientific Instruments." W. BUTCHER & SON (W. Butcher and W. F. Butcher).—*Dated September*, 1895.

PATENTS COMPLETED.

AN IMPROVED OPTICAL LANTERN.

No. 15,643. JOHN AIRS, 152, Farringdon-road, W.C.—*August* 3, 1895.

To simplify the working of a single or multiple optical lantern by having a hinged frame on the forward end of the lantern, upon which the front or fronts are mounted, and by suitable mechanism can adjust the planes of the front or fronts together or separately, so that the discs of light occupy the same position on a given space. The object of the frame being hinged to the forward end is to give access to the inside of the lantern and to the condensers.

IMPROVEMENTS IN THE MANUFACTURE OF MINERAL AND ENAMEL COLOURS FOR USE IN THE PRODUCTION OF CERAMIC AND OTHER PHOTOGRAPHS.

No. 3356. GEORGE JONES ATKINS, 1, Moselle-gardens, Tottenham. *August* 17, 1895.

IT is well known that attempts have been made to substitute mineral and enamel colours for the carbon and other pigments used in the ordinary carbon process of photography, but hitherto, so far as I am aware, without success.

The carbon process is based upon the use of a mixture of gelatine or other analogous colloid used as vehicle and carbon, such as Indian ink, for example, or other pigment. This mixture is spread upon paper, and forms what is called carbon tissue, which is made photo-sensitive by means of a solution of bichromate of ammonium, sodium, or potassium, and, when dry, is placed under a suitable photographic negative, and exposed to the action of light. This brings about a chemical action, by which the gelatine is rendered more or less insoluble, where the light has passed through the negative. The tissue, after suitable exposure, is then transferred, and subjected to the well-known process of development, that is, to say, the gelatine that has not been rendered insoluble by the action of light is washed out with hot water.

When ceramic or vitrifiable pigments are substituted for carbon, it is found that, on sensitising the tissue and drying it, there has already been brought about a similar chemical action to that produced by light, which renders the tissue or compound unfit for photographic purposes.

Of the metallic compounds constituting these pigments, those which are most acted upon in this way are the oxides of iron, manganese, copper, lead, and cobalt, and these are the principal ingredients employed in producing the various dark-coloured pigments used for vitrifiable colours, and are of the greatest commercial value.

The object of the present invention is to obviate the above-described premature action of the mineral pigments upon the mixture of gelatine and sensitising salt. For this purpose, I treat the mineral or enamel colour preferably with solutions of soluble chromate in such manner as to bring about saturation of the constituents of the enamel mixture with chromic oxide (CrO^3), thus preventing the reaction above described when the compound is brought into contact with the gelatine, or other colloid substance, in admixture with the sensitising salt.

This combination, and consequent change, may be effected in a variety of ways; for example, according to one method, I grind the mineral or enamel colour to a powder, and then treat it with a solution of chromic acid, or bichromate of ammonium, potassium, or sodium, of a sufficient strength to satisfy the metals or minerals in the colour under treatment. This saturation of the metal or minerals with chromium oxide can always be secured by having a slight excess of the chromium salt, which excess is indicated by a yellow tint imparted to the solution. The resulting compound is then dried, or not, according to circumstances, and may be mixed with the gelatine or other colloid, and made into tissue or film without fear of any premature action taking place when it is afterwards treated with the sensitising agent.

In the case of the enamel colours, the preliminary combination of the chromium salt with the metallic oxide may be effected in the crucible in which the fluxes and minerals are fused together, but the colours are generally somewhat changed by this method of treatment.

The salt of chromium may also be combined with the mineral or enamel colour in the grinding operation.

I prefer the humid method of treatment first described above, as the excess of chromium salt can be readily washed out, and the colour can be used in the wet state, or dried and kept for subsequent use.

What is claimed is:—

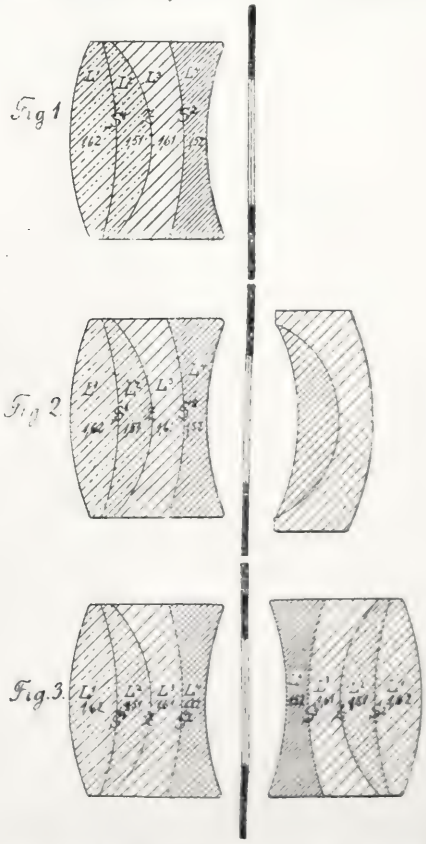
The herein-described method of rendering mineral and enamel colours suitable for photography by treating them with chromic compounds sufficient to saturate their metallic components before mixing them with the gelatine or other colloid substance for forming films.

IMPROVEMENTS IN OBJECTIVES FOR PHOTOGRAPHIC PURPOSES.

No. 13,162. CARL PAUL GOERZ, 140, Hauptstrasse, Schöneberg, and EMIL VON HOEGH, 20, Prinzregentenstrasse, Wilmersdorf, both near Berlin, Germany.—*August* 17, 1895.

OUR invention relates to objectives for photographic purposes.

Objectives of high illuminating power which are used for photographic purposes have nearly of all them astigmatic errors, so that only the central part of the image is sharply defined. Moreover, the illuminating power of such



objectives is reduced when the astigmatic errors are corrected, so that their use in those cases where considerable illumination is required is limited.

Now, the object of our invention is to provide an objective of high illuminating power and free from astigmatic error.

To enable our invention to be fully understood, we will describe the same by reference to the accompanying drawing, in which—

Figure 1 is a vertical section of our improved objective,

Figure 2 is a vertical section showing the objective combined with a single objective, and

Figure 3 a similar view, showing the objective in use as a double objective.

According to our invention we form the objective of four single lenses cemented together. The first lens, L^1, is a double convex lens of high refractive index (1,62), the second lens, L^2, is a concavo-convex lens of low refractive index (1,51). Next come two negative lenses, L^3 L^4, the first of which, L^3, is a concavo-convex lens of high refractive index (1,61), the second being concave and having a low refractive index (1,52).

With this arrangement the cement surfaces, S^1 and S^2, converge the light rays, and the surface Z acts divergently on the same. The astigmatic errors, occasioned by the surface Z, and which have a detrimental effect on the definition of the margin of the image, are equalised by the surfaces S^1 and S^2, which produce an opposite effect; whilst the spherical errors, occasioned by the surfaces S^1 and S^2, and which have a detrimental effect on the illumination and definition of the middle of the image, are equalised by the opposite effect of the surface Z.

Our improved objective can be employed either as a single objective or it can be combined with any other single system, as shown in figure 2, or it can be used as a symmetrical double objective, as shown in figure 3.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—An objective for photographic purposes built up of four single lenses cemented together, two adjacent lenses being positive and of different refractive indices, the other two adjacent lenses being negative and of different refractive indices, so that a lens of low refractive index is always in contact with a lens of high refractive index, substantially as described.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
23	Ashton-under-Lyne	Last Day for sending in Lantern Slides for the Special Society Competition.
23	Camera Club	Smoking Concert.
23	North Middlesex	*Photo-Ceramics*, with Demonstration. W. Ethelbert Henry.
23	Richmond	
24	Birmingham Photo. Society	*The Chemistry of Photography: the Theory of Development, the Preparation and Preservation of Photographic Chemicals and Solutions.* M. O. Suffield.
24	Hackney	*Various Applications of the Dusting-on Process*, with Demonstration. W. Ethelbert Henry.
24	Halifax Camera Club	
24	Lancaster	
24	Leith	
24	Paisley	
24	Rochester	
24	Royal Photographic Society	
24	Warrington	
25	Ashton-under-Lyne	Exhibition of Lantern Slides.
25	Burnley	
25	Leytonstone	Discussion on Negatives produced on Gem Dry Plates and Prints on Criterion P.O.P.
25	Newton Heath	*A Trip to the Channel Islands.* J. Fortune.
25	Photographic Club	
25	Southport	*Stereoscopic Transparencies.* D. G. Wilkinson.
26	Bradford	Members' Quarterly Competition.
26	Camera Club	*Views of the China-Japanese War.* D. S. Brearly.
26	Glossop Dale	
26	Halifax Photo. Club	
26	Hull	
26	Leeds Camera Club	*The Chemistry of Photography.*—I. Dr. J. T. Thresh.
26	Liverpool Amateur	
26	London and Provincial	
26	Oldham	
27	Cardiff	
27	Croydon Microscopical	*Lantern Slides by Reduction.* J. H. Baldock, F.C.S.
27	Holborn	
27	Maidstone	
27	Swansea	
28	Hull	
28	North Middlesex	Excursion: Surrey Commercial Docks.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

SEPTEMBER 12,—Mr. A. Haddon in the chair.

Mr. R. A. Parry was elected a member.

Mr. A. COWAN showed a negative of a group which was fogged, and also an unexposed plate out of the same box, which was also fogged, and asked the opinion of the meeting as to the cause of the fog on the latter.

The CHAIRMAN, referring to the unexposed plate, said it had evidently been in a slide for some time, as it showed the mark of the rebate as well as of the spring and hinges.

It was also the general opinion of the meeting that the fog was caused by the slides.

Mr. COWAN was glad to hear this confirmation of his own views, and he referred to a communication from the user of the plates, in which it was denied that the fogged unexposed plate had been in a slide. The writer also twitted him (Mr. Cowan) with lack of knowledge on the subject, at which the assembled members of the London and Provincial indulged in considerable merriment.

COLLOTYPE.

Mr. W. T. WILKINSON prefaced a practical demonstration of collotype by describing the process. The first essential, he said, was a glass plate, the surface of which should be ground, for several reasons, chief of which was that the surface might not be free from scratches. The grinding was effected by rubbing the surfaces of two plates together, with flour emery and water for five minutes. The ground surface having been well cleaned, a substratum of beer and silicate of soda was applied to it. He recommended the silicate of soda sold by Hopkin & Williams. When the substratum was dry, the excess of soda was washed out, and the plate again dried. It was then ready for the sensitising solution. That which he was then using consisted of—

Gelatine	100 grains,
Water	2½ ounces,
Powdered bichromate of potash	25 grains,

the bichromate being added when the gelatine was dissolved by heat. A hard gelatine was best for collotype, and he recommended that sold by Kreutze. With a soft gelatine the grain was exaggerated, but with a hard kind it was difficult to get. For hand-press work he recommended the addition of spirits of wine to the gelatine mixture, it being stirred gradually in. The addition of the bichromate to the gelatine before dissolution tended to have a hardening effect. He did not advise the use of bichromate of soda as a sensitiser. The mixture should be maintained at a temperature of 110°, and, after filtration through two thicknesses of old flannel, applied to the plate, which had been previously levelled on top of the oven, the temperature being 120°. As regards the quantity of solution to be applied, he recommended five minims for each square inch. The plate, having been coated, was placed in the drying cupboard; it took an hour and a quarter to dry. A plate to the gelatine film of which spirit had been added would only take three-quarters of an hour. Coming to the negative suitable for collotype work, he said it should be full of detail, dense without being hard, and soft without being flat. He showed two which had been masked at the edges with tinfoil; this allowed perfect contact, and did not absorb moisture. As to the question of exposure, he said it varied in duration, according to the season of the year. When all detail was visible at the back of the plate, it was removed from the frame, and the excess of bichromate washed out. The next operation was the etching of the film, this being done by means of a solution consisting of—

Glycerine	1 part,
Water	5 parts,

and a little ammonia added.

Mr. Wilkinson then proceeded to scrape the roller he was about to use, and, having prepared the ink by mixing a little varnish with some stiff ink, inked up two or three plates, and produced several proofs in a Voirin press that had been lent for the occasion.

Both the lecture and demonstration were highly appreciated, and Mr. Wilkinson, having answered one or two questions that were put to him, was heartily thanked by the members, several of whom testified to the full and unreserved manner in which he had treated his subject.

PHOTOGRAPHIC CLUB.

SEPTEMBER 11,—Mr. R. P. Drage in the chair.

The Hon. Secretary read a circular from the Liverpool Photographic Club respecting a memorial fund which had been started on behalf of the widow of the late Mr. B. J. Sayce.

Mr. BEDDING suggested that a special general meeting of the Club be called to consider the matter, and the Hon. Secretary was instructed to draw up the necessary document, and to obtain the requisite number of signatures.

The matter of appointment of Judges for Mr. Watkins's competition was considered.

Mr. BEDDING proposed Mr. Bridge, and Mr. TOTTEM seconded.

Mr. TROUP proposed Mr. Wellington, and Mr. FOXLEE seconded, and it was duly agreed that Messrs. Bridge and Wellington be the Judges.

The CHAIRMAN drew attention to the number of binocular cameras which appeared to be used on the Continent, and also at the numbers of hand cameras generally.

Mr. Fry showed two pictures made on Wellington's tinted crayon bromide paper.

Mr. TOTTEM said that it would be an easier method to judge of the effect of the paper had there been less working by the artist and also a better light in the Club room.

Mr. BEDDING said that he had used some of the paper for landscape contact prints, and he considered the effect obtained very good.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held on Thursday, the 12th inst., at 36, George-street, Mr. H. M. Whitefield (the President) in the chair.

Examples of work done on a new printing paper, manufactured by Messrs. Wellington & Ward, were exhibited and reported upon by Mr. Casson.

The President also gave his experience with the same paper, and the specimens exhibited were favourably received.

Metol developer was mentioned in the discussion which followed, and several members spoke of inflamed finger ends and peeling of the skin after

using this solution, and it was considered advisable to touch the solution as little as possible during working.

The tone known as Bartolozzi red was also mentioned. Mr. BROTHERS said that reproductions in this colour could usually be seen exhibited in Messrs. Rowley's windows, in St. Ann's-street, and Mr. H. WADE stated that one of the easiest methods of producing this tone is to print rather deeply, and, without washing, immerse in hypo, afterwards rinse the print in water and place in a solution of bichromate of potash and wash; the whites were left quite pure.

Mr. Casson also exhibited proofs he had made on Dr. Jacoby's direct-printing platinum paper.

Mr. T. CHILTON read a paper on *Photographic Failures*, urging the advantage of openly discussing the same, and concluded by exhibiting some negatives, produced on plates by a noted maker, which were faulty, owing to minute specks, of irregular shape and size, appearing almost all over the plate, and solicited a possible explanation of the defect, ordinary care having been used in the working of them.

The general opinion was that dust had settled on the plate during preparation, and this opinion was in some measure justified by the Hon. Secretary saying that he also had some plates from the same source with the same defect, but much more pronounced.

Mr. BROTHERS sought information respecting a double image (the second one rather weak), which occurred on a negative supposed to have had one exposure.

After carefully examining the print, it was generally considered that the result was owing to a second exposure by some means or other.

Messrs. Hyde and Warburton were appointed auditors of the accounts to be presented at the annual meeting in October.

Hackney Photographic Society.—September 10, Mr. E. Puttock presiding.—The Hon. Secretary reported progress of the Exhibition arrangements. Mr. Roofe showed a lantern slide, the result of an experiment made to test the value of backing a lantern plate before exposure. In the experiment, half the plate was backed with caramel, and the other half left unbacked. The result showed a slightly increased brilliancy in the backed half when compared with the other portion, but the difference was not very striking. Mr. Guest showed the results of a similar experiment; in this, the unbacked half had a piece of white paper placed behind during exposure. The difference in this slide, as in the other, was not striking, but the sky seemed clearer in the backed half. The rest of the evening was devoted to testing members' slides, and selecting those intended to compete in a certain competition.

Leeds Camera Club.—The first meeting of the winter session was held in the Club's new rooms at Brayshay's Restaurant, Bond-street, on Thursday evening last, when the PRESIDENT (Dr. J. Thomas Thresh) gave his inaugural address before a large attendance of members. The President complimented the Society upon the success it had achieved during the past twelve months, both numerically, financially, and as regards work done. The social status of the Club was also in a much higher position than hitherto, numbering, as it did, amongst its patrons, such gentlemen as the Mayor of Leeds, Lord Playfair, Professor Thorpe, Sir George Irwin, all the local members of Parliament, and the names of many other gentlemen who hold high positions in scientific and artistic circles. The Club was also to be congratulated upon its change of rooms, the present ones combining the acme of comfort with convenience for lectures and demonstrations, and central situation. The syllabus for the first portion of the winter session was presented to the members, the list of subjects evidently giving the utmost satisfaction, promising to be even more useful than that of any previous year. Incidentally the President mentioned a few subjects with which he is at present experimenting, amongst others being a new substitute for the lime in the oxyhydrogen lantern, the new gas-acetylene, photo-ceramics, and a new paper for photographic printing, and promised lectures or demonstrations on each of these subjects at some future date. As the Club has become affiliated with the Bradford Society, members are entitled to attend meetings of that Society. Another advantage is the formation of a Club library, and a good selection of books has been already received. Councillor GREEN HIRST (Vice-President) proposed, and Mr. HOMBURG seconded, a vote of thanks to Dr. Thresh for his interesting address, which was heartily accorded. Eight new members were proposed and elected. Next meeting, September 26. Subject, *The Chemistry of Photography* (No. 1 of a series), Dr. J. T. Thresh. The annual dinner was announced to be held at the Grand Resturant on October 3, and tickets can now be obtained.

FORTHCOMING EXHIBITIONS.

1895.	
Sept. 23	*Leeds. G. Birkett, City Art Gallery, Leeds.
,, 23–28	*Westbourne Park Institute.
,, 24	*Royal Cornwall Polytechnic Society. Edward Kitto, The Observatory, Falmouth.
,, 30–Nov. 2	*Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 30 Nov. 14	*Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
Oct. 28, 29	East London Photographic Society. Hon. Exhibition Secretary, F. Uffindell, 29 Scrutton-street, Finsbury, E.C.
,, 28–Nov. 2	*Southport. G. Cross, 15, Cambridge-arcade, Southport.
,, 29–Nov. 1	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.
Nov. 19–21	*Hackney. W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 28–30	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

A USEFUL VARNISH.

To the EDITOR.

SIR,—In Dr. Hall-Edwards's very appreciative remarks under the above heading in your issue of July 19 on our cyrstalline or celluloid varnish, he describes that he had been using as being too thick for photographic purposes until he discovered a medium for thinning it. May we be permitted to explain to Dr. Hall-Edwards, and such of your readers as have been interested by his paper, that we think he must have bought, possibly through a wholesale chemist, the grade of crystalline made by us for dermatologists, as the grade we make for photographers is thinner, and of a consistency suitable for their purposes?—We are, yours, &c., THE ANGLO-AMERICAN VARNISH COMPANY.

Birmingham, September 13, 1895.

PRINT WASHING.

To the EDITOR.

SIR,—I am interested to see that Mr. W. B. Bolton, in his article on *Mechanical Aids in Print-washing* in last week's JOURNAL, recommends trays made from a frame of wood, with a canvas bottom, the trays then to be clamped in one block and immersed in the washing vessel.

For the last five years I have washed my gelatine emulsion prints identically in this manner, placing the block of trays in a zinc water tank of suitable dimensions. The trays, of course, are home-made; and I can bear testimony with Mr. Bolton as to their efficacy. Like Mr. Bolton, too, I at once found that the buoyancy of the block of trays required a weight placing on the top to keep the block in position.—I am, yours, &c., EDWARD W. MELLOR.

Fair Lawn, Lytham, September 16, 1895.

IMPURE HYPOSULPHITE OF SODA.

To the EDITOR.

SIR,—By the tenour of your remark in your issue of the 6th, I think I have failed to make the incident as clear as I should have done. The *plain* solution of hyposulphite does not deposit any crystals, it is *not until plates or paper have been fixed in it* that the deposit occurs. On plates it seems like a sandy deposit of very hard, sharp crystals, and rubbing them off abrades the film. They gradually deposit on the bottom of the containing vessel, and leave a yellow stain wherever they adhere.—I am, yours, &c., EDWARD DUNMORE.

P.S.—If I can get a sample of the soda, I will forward it to you to experiment with.—E. D.

THE CHELTENHAM EXHIBITION.

To the EDITOR.

SIR,—I shall esteem it a favour if you will allow me to state in your columns that entry forms for the Cheltenham Photographic Exhibition should reach me by October 1. There are thirty medals offered, three of these being gold, and I shall be glad to forward full particulars with entry forms to any amateur or professional interested.—I am, yours, &c., PHILIP THOMAS.

Cheltenham, September 13, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, half-plate rapid rectilinear lens in exchange for a Dallmeyer *carte-de-visite* portrait lens.—Address, SCAMELL, 120, Crouch-hill, N.

Wanted half-plate R.R. lens in exchange for twenty-eight one shilling parts of the *Universal Atlas* (just published), complete and up to date), and thirty parts of *Our Own Country* (now publishing).—Address, E. J. BROOKS, 103, Marlow Moor-road, Didsbury, Manchester.

Wanted a half-plate stereoscopic camera, with three double dark slides, in exchange for either a good, quick-acting, half-plate portrait lens, magic lantern, camera and six lenses for postage-stamp portraits, or a 5×4 hand or stand camera.—Address, VICTORIA PHOTOGRAPHIC COMPANY, 89, Milkwood-road, Herne-hill, London, S.E.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED :—

John Owen, 49, Broad-street, Newtown, North Wales.—*Portrait of the late Samuel Miller.*

S. E. H.—We do not know the full address, but Steinheil, optician, Munich, is sufficient.

EDGAR GAEL.—The lens is one of the first-made orthoscopics. It is complete in itself, but was wrongly put together as you sent it.

C. C. COX.—The chief difference between the two classes of lens named is that the more modern one is said to cover flatter than the other.

S. J.—One part of alum cannot be dissolved in three parts of cold water. Alum is much more soluble in hot than in cold water; but it crystallises out again on cooling.

PHOTOGRAPHER says: "Will you kindly give me the address where I can get Saxe photographic paper?"—In reply: We believe Messrs. Otto König & Co., 27, Cross-street, Finsbury, E.C., supply the paper.

OMEGA.—Your query is put so vaguely that it is not possible to reply in such a way as to be of any value. Write again and be more explicit. If the new process is a strictly secret one, it is quite possible that we may not know much about it, after all.

WORCESTER.—To coat paper with indiarubber, make a solution by dissolving masticated rubber in benzole. Put this into a flat tray and float the paper upon it, drain, and dry. That is the way the paper was prepared for the carbon process, as it was worked in its early days, and as it is largely still on the Continent.

LANTERN.—As the railway companies will only carry charged gas cylinders on their own terms, the only thing to do is to submit to them, or have them sent by some other conveyance. As to the delay, that can be overcome by ordering the gas a few days before it is wanted for use, so as to ensure its arrival in time for the lectures.

A. MCD.—Your remedy, if any, is in the County Court, but we doubt if you have any at all. The girl was not apprenticed, and there was no agreement. Of course, while the girl was with you, you had her services in your business as learner. As we have said, we do not see on what ground you can recover anything. Certainly you can only sue as for a debt.

H. E. BEAUMONT says: "In THE BRITISH JOURNAL OF PHOTOGRAPHY for September 6 I noticed a reference to a fine photograph of the *Valkyrie* or *Defender* by a certain firm of photographers. Not having the number by me, would you be so good as to inform me what the photograph was, its size, and price?"—The size of the picture was about whole-plate. Communicate with Adamson & Son, Rothesay, N.B.

T. MONROE (Glasgow).—When once platinotype paper has become damp, although it may be dried again, it must not be expected to yield good prints. It is no fault of the paper, it is one of its properties, and that must be recognised. The makers of the paper take every precaution that the paper is well protected when they send it out, and caution their customers that it must be kept absolutely dry. What more can they do?

W. BOULTER.—1. Gelatino-bromide paper has quite superseded the old iodised paper for enlargements by artificial light. It is more sensitive, and is less troublesome in working. We should advise you to give it a trial before going back to the process of thirty years ago. 2. The proportion of chrome alum to gelatine depends entirely upon the gelatine. Some samples require two or three times as much as others. With a few experiments, the correct proportion for the kind of gelatine employed will be arrived at.

W. D. SIMPSON.—It is rather unfortunate that the lady has taken your advice in too literal a manner, and has carried the over-printing of the positives to such an extent as, in your opinion, to render them too deep to be irrecoverable. But things may not be quite so bad as you surmise. Try the following cure: Before proceeding to tone, immerse the prints, one at a time, in a *strong* solution of hyposulphite of soda, by which, after a few minutes, they will be reduced. When sufficiently so, tone and wash.

S. ABRAHAMS.—Evidently too much bichromate of potash has been added to the solution of gelatine, so that it crystallised out as the film dried. The only remedy is to use less of the salt. There is no advantage in using such a large proportion of the bichromate even if it did not crystallise out; and, moreover, the plates, with a large quantity of the salt, deteriorate very quickly compared with those containing less. As the quantity employed is not mentioned, we cannot say what reduction should be made.

J. YOUNG writes: "I have an oil painting which, through an accident, got some hot glue on the back, which has soaked through to the front of the painting and spoiled it. Could you recommend anything that would remove same without injuring the paper?"—The only thing we can suggest is to moisten the glue at the back by laying on it a damp blotting-paper or a sponge, and, when the glue is thoroughly softened, sponging it off with warm water. Whether the treatment will injure the picture, we cannot say. It will most likely cause the paper to cockle.

S. CHARLES.—The solution you are using is weaker than is generally employed. As the bath gets weaker still, as you say, it should be made up to at least its original strength, then it will work well. We cannot say if the paper you use has any injurious influence on the silver bath, as we do not know how it is prepared. Purple tones in prints depend more upon the character of the negatives that are used than upon the formula by which the paper is sensitised. However, if the paper is sensitised on a too weak bath, purple tones are an impossibility with any negative.

B. ELLIOTT.—1. A portrait combination is used for the lantern because of the large volume of light it transmits. 2. The proper distance from the condenser at which to place the negative is where the cone of light illuminates the negative and no more. 3. Multiply the focus of one lens by the other, and divide this product by the focus of both added together, less the distance of separation. The quotient is the focus sought for. 4. Microscopic views are made in a camera specially constructed for the purpose. We do not know where they can be obtained. You had better advertise for one.

S. G. C.—If you are sure that your copyright in the photograph is good, lose no time in getting your solicitor to take proceedings for an injunction to restrain further publication, and for damages. Notwithstanding that the Courts are now in vacation, the application can be made to the Vacation Judge, who can grant an injunction forthwith. It is quite probable, when the application is made, that the paper will submit and agree to reasonable damages, as did another illustrated paper to the Autotype Company, as mentioned in our issue of the 6th inst. Don't lose any time in the matter.

E. H. THORNE inquires if paper is supplied the same as carbon tissue, but without colour, that is, coated with the same kind of gelatine, &c., so that, when the image is developed, it will be perfectly colourless, instead of being like a carbon print.—So far as we are aware, such a paper is not supplied commercially, though it could easily be made to order. Such paper could not, however, be used like carbon tissue, because the action of light in printing would penetrate through the film to the paper, so that it could not be removed for development. This the pigment in ordinary tissue prevents.

SYDNEY ST. GEORGE writes: "Would you kindly inform me which would be the most effectual for portraiture, the electric light or incandescent gas light; and also which will be the least expensive to fit up? I should mention that the electric lighting is to be laid down in the street in a week or so."—We should certainly prefer the electric light, as the current can be obtained from the main. Good portraits can be taken by incandescent gaslight, and possibly its installation might be a little less costly, but the difference, we imagine, would not be great, as the current is obtainable from the street.

F. G. B. (North Italy) writes: "May I ask for information through your columns regarding the following: To what office, or to whom is it necessary to apply in order to get photographs copyrighted or registered in England, and how can I get full information as to fees, &c.? How does one copyright or register photographs in Italy and France? I am taking a number of original views in England, France, and Italy, and am, of course, anxious to prevent them being copied and prints sold, but do not know how to go about the necessary steps in order to keep the commercial interests of my photographs."—English copyright should be registered at Stationers' Hall; the fee is one shilling. Under the International Copyright Convention a photograph made copyright in any country signatory to the Convention becomes copyright in all. France, Italy, and this country are included. Therefore, if the pictures are copyright in any one country, they are copyright in all.

CONTENTS.

	Page
THE ENJOYMENT OF COPYRIGHTS	593
THE INTENSIFICATION OF PROCESS NEGATIVES	594
JOTTINGS. By COSMOS	596
THE GENESIS OF A RESIDUE JAR. By G. WATMOUGH WEBSTER, F.C.S.	597
PHOTOGRAPHY IN THE CHINO-JAPANESE WAR. By SHYOZABARO TOTANI	598
CRITICS. By ABRAHAM BOGARDUS	599
COLOUR PHOTOGRAPHY	599
HALF-TONE ENGRAVINGS BY THE ENAMEL PROCESS. By ROBERT WHITTET	600
OUR EDITORIAL TABLE	604
NEWS AND NOTES	604
RECENT PATENTS	605
MEETINGS OF SOCIETIES	606
FORTHCOMING EXHIBITIONS	607
CORRESPONDENCE	607
EXCHANGE COLUMN	607
ANSWERS TO CORRESPONDENTS	608

THE BRITISH

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OUR FORTHCOMING ALMANAC.

The Almanac for 1896 being now in course of preparation, we take this opportunity of inviting our friends to contribute to its pages short practical articles descriptive of their recen experiences and experiments in photography. The popularity and value of the Almanac have always been largely due to the inclusion in its pages of many contributions from photographers of great ability and knowledge, a feature in which we cordially invite the co-operation of our readers in all parts of the world.

We shall also be glad if intending contributors will let us have their articles, sketches, &c., at as early a date as possible, so that the risk of their having to be omitted through lateness of arrival may be obviated.

Secretaries of Societies, and especially of those founded during the year, if they have not already done so, will oblige by at once forwarding lists of officers for inclusion in the directory of photographic Societies, so that this section of the Almanac may be made as complete as possible.

LARGE PAPER NEGATIVES.

Not every one knows what it is to toil over a decidedly undulating country carrying with him a 12 × 10 camera and a quantity of glass plates for the same. These plates from their dimensions must of necessity be thick and strong, and therefore be possessed of some weight. "Oh that glass plates could be made without weight and fragility!" was the aspiration of a gentleman who, having returned from the Tyrol with three dozen 12 × 10 plates, exposed but as yet undeveloped, witnessed the fall of the box containing them from the shoulder of the porter, to whom they had been entrusted, on to the hard stone pavement of the street, where waited the cab to convey them to their destination.

Glass plates having the characteristics above named are, of course, out of the question, but inexpensive substitutes for them, which should be neither weighty nor brittle, are worthy the consideration and study of the experimentalist. For the encouragement of such as are of this class, it may be stated that the application of celluloid to this purpose was an outcome of trials made with substances somewhat allied to it in flexibility and translucence. It is probable that, for the smaller sizes of negatives, it will be difficult to beat celluloid, but our plea is for a less expensive base than this for negatives of large dimensions, one which will not prove a tax either upon the finances or the carrying powers of the artist.

The objection sometimes taken to paper that it must necessarily show granularity in the print is not well made. It might have been sustained had the conditions under which negatives were taken in the days long gone by been in force now. Then the image was embodied in the fibre of the paper, now it rests in a thin pellicle on the surface; and yet, in some of these negatives of half a century ago, sharpness in a high degree was often obtained without any trace of granularity from the paper being perceptible; hence, in searching for a substitute for glass which shall, in large sizes, prove less costly than celluloid, paper is undoubtedly the first material that suggests itself. It is easily obtained, is cheap, handy, and workable.

Some experiments we have been making with a rather common class of paper suggest a direction in which further experiments might be profitably made. Reasoning from two factors—the rendering of paper nearly transparent by means of varnish, and the wonderful powers of insolubility conferred upon gelatine, glue, and allied substances, by means of formalin—we coated one side of a sheet of paper with a cheap and rather heavy body of gelatinous size, which was afterwards treated by a wash of formalin. This, as every one knows who is acquainted with the action of these two one upon the other, rendered the coating quite hard without impairing its flexibility. After a washing in water and subsequent drying, the paper was coated with sensitive emulsion, and eventually yielded a negative which was not inferior to one of the same subject taken upon glass. Previous, however, to its being printed from, it was rendered translucent by the application of a solution of Canada balsam to the back, this being applied by an ordinary wide varnish brush.

Another direction in which we have experimented in the endeavour to find a cheap substitute for glass is the formation of an insoluble sheet of gelatine of a Russian glue character on account of its lowness of price. When dissolved and ready for pouring out upon the sheet of tinned iron on which the film was to be formed, a small quantity of formalin was added and well incorporated with the transparent glue, which was then poured out upon the tin plate previously made slightly warm to facilitate its spreading evenly before setting. This yielded a smooth, good film to which sensitive emulsion could be applied without disturbing it, for the quantity of formalin was

such as to render it unaffected even by boiling water. We are aware of one manufacturer of sensitive camera tissue—the late M. Vergara, if we mistake not—who prepared films by analogous means, viz., mixing a bichromate salt with the gelatine, which, when dried and exposed to light, was rendered quite insoluble, the brown colour thus caused being discharged by the agency of sulphurous acid. This was done on a manufacturing scale, and, whether we are quite correct or not in describing the means employed, we do know that some good films were made by those means. But in those days the powerful action of formalin upon gelatine had not been discovered. We look upon the method with formalin, just described, as being much better than the Vergara system.

If the makers of bromised emulsion paper could be induced to supply us with a more sensitive emulsion spread upon a thin paper, it would prove a great boon to many of the public, and would, we believe, be the means of many going in for large direct negatives who are now deterred by the weight of glass plates or the expense of large celluloid films. In the early times of the art, when negatives on paper was the regulation system, and each photographer prepared his own sheets, large sizes prevailed, 12 × 10 or 15 × 12 being thought nothing of, and we possess paper negatives of the period hinted at which will yield prints infinitely superior in every respect to quite a number of photographs we have seen on the walls of the Salon during the present week.

Before concluding, we may say that in the forthcoming ALMANAC will be found an article on this topic by the revered experimentalist, Dr. R. L. Maddox, who accompanied his article by a number of negatives on paper, which will be shown to any one who calls for the purpose during the next few days, after which they are to be returned. They are on bromised paper rendered translucent by means described in his article.

GELATINE AND ALUM.

NOTWITHSTANDING all that has been written as to the effect of chrome and other alums on gelatine, there appears still to be a considerable amount of misconception on the subject, that is, if one may judge from the number of letters that, from time to time, have to be replied to in our "Answers" column. A very frequent query is such as that replied to last week and another this week. In effect, it is, What proportion of chrome alum should be added to a solution of gelatine to make a film of it insoluble when dry? Judging from letters often received, some people evidently surmise that gelatine which has been rendered insoluble by the action of alum is no longer absorbent, and that it retains its horny condition even when long soaked in water. That is a fallacy, and not the only one in connexion with "insoluble gelatine," that it may be as well to dispel once more.

Although chrome alum and other alums render the gelatine quite insoluble when treated with warm water, it will not harden it to such a degree that it will not be softened by its action and become flexible, and, by continued soaking in hot water, get quite soft and flabby. Indeed, under the prolonged action of hot water alone, it can—even the most insoluble by alum—be brought into a quite jellied condition. Gelatine made insoluble by means of alum is analogous to leather. Practically, leather as used for boots is gelatine rendered insoluble by tannin. Leather, as we all know, absorbs water if soaked in it, when it becomes softened and pliable. The insoluble gelatine is similar in its behaviour.

There is an effect produced with chrome alum and gelatine that many people do not seem to be aware of, namely, a continuing hardening action up to a certain point. If, for example paper be coated with gelatine containing chrome alum, or a film be formed of it, and the proportion of alum is insufficient to produce actual insolubility at the time, the film will become harder and harder the longer it is kept. After a time, water at such a temperature as would have dissolved it freely when first made will eventually not do so. In this respect the action seems to be somewhat akin to the "continuating action of light" in exposed carbon tissue, although it is very much slower. This progressive action appears to be slower with potash and ammonia alums than it is with the chromium salt.

With regard to the proportion of chrome alum that should be used to bring about insolubility or partial insolubility when the film is dry, that will depend upon the character of the gelatine, to begin with. Here is an instructive experiment. Take two samples of gelatine—one of the hard kind, such as Coignet's gold medal, and the other of the soft sort, such as are generally known as soup gelatines—and make a solution with each, say, in the proportion of one part to five of water. Bring them both to the same temperature—110° Fahr., for example—and add by degrees and with constant stirring a twenty-grain solution of chrome alum until the gelatine becomes insoluble or coagulates. It will be found that very little will be required in the case of the former as compared with what will be necessary in the case of the latter—with some samples not a quarter. Next make similar solutions, using the same weight of the gelatines, but this time dissolved in fifteen or twenty parts of water, and repeat the experiment. It will now be found that several times the quantity of alum will be necessary to bring about the coagulation as before, although there is no more gelatine in the solution than there was in the former instance. This shows that not only is the proportion of alum dependent upon the kind of gelatine used, but also on the strength of the solution to which it is added.

Every one is aware that different brands of gelatine vary considerably in these properties, and those who have had extended experience with them are fully alive to the fact that rarely are two batches of the same brand identical, and, further, that they are often widely different. It may, however, be mentioned that there is a greater uniformity in the different brands of English gelatines than there is in the foreign ones. This may, possibly, be accounted for by the fact that the latter are more "clarified" and highly bleached than the former. Most of the best foreign gelatines are transparent and nearly colourless, while the majority of those of home manufacture are opaque and have a considerable amount of colour in them. It is generally thought that this bleaching and clarifying has much to do with the want of uniformity in the different batches of foreign gelatines. Some gelatines of Continental manufacture actually contain alum, which gives them a fictitious strength. With such kinds as that, it is manifest they will not take so large a proportion of chrome alum to bring about insolubility as those that are free from it, and that is the case with the majority of gelatines of English make. Let us now come to the practical part of the question.

How is one to know what proportion of chrome alum to add to a particular sample of gelatine to cause insolubility, or such a degree of partial insolubility, as may be desired? Make up

a solution of the gelatine to be employed, and of the strength it is desired to use. Then add to it a twenty grain warm solution of chrome alum, and note the quantity that is necessary to bring about coagulation. About two thirds of that quantity, whatever it may be, will be sufficient to give a film that, when dry, will have about the maximum of insolubility that can be obtained with a solution that can be conveniently worked with. Half the quantity will, generally, give a partially insoluble film that will swell up and become slimy and adhesive when treated with water at a temperature of 100° to 110° Fahr. Less chrome alum will, of course, give less insolubility. The above proportions are not to be taken as being definite, but only as indicating how, in practice, the degree of insolubility desired, with different samples of gelatine, may be arrived at, and that can only be arrived at by direct experiment.

Formic aldehyde has lately been applied to bringing about insolubility in gelatine, and the subject is partly dealt with in the preceding article.

Aluminium.—The value of this metal for a variety of purposes is being seriously discounted. It has been tried in the American Navy and given up, through the action of salt water upon it, and its usefulness for cooking utensils has lately been discredited in a paper by M. Ballund, brought before the Paris Academy of Sciences. The time cannot be far distant when we shall be able to form an opinion of its true value in photographic apparatus and lenses, for which latter purpose aluminium is so rapidly growing in favour.

A New Form of Albumen.—A new method of producing or extracting albumen has recently been patented in the United States. It is made by mixing diluted defibrinated blood with an acid, coagulating the albumen by heating to about 195° Fahr., washing the albumen in water, drying, and heating the product *in vacuo* at 100° Fahr., and reducing to a fine powder. Already blood albumen is stated to be largely used in the manufacture of albumenised paper; it now remains to be seen whether it is likely to be replaced by this new form.

A Burner for Monochromatic Light.—An addition to the already numerous existing kinds of lamps has recently been made; but, instead of the usual dull non-illuminating flame, the new burner promises a brilliant light for a continuous period of time. Its essential parts as described in an abstract in the Journal of the Chemical Society from Herr Pribrani's descriptive paper, are a wire gauze atmospheric burner, platinum boats containing a mixture of sodium chloride and bromide, and a casing with side tubuluxes and chimney. Such a lamp might have many valuable applications in photography.

Acid Sulphite of Soda, or, as its correct chemical designignation runs, sodium hydrogen sulphite, has been examined, under the severe temperature conditions of last winter, with interesting results. A solution of 1·29 sp. gr. deposited crystals of the composition $Na_2S_2O_5+7H_2O$, which tended to effloresce in the air, and had a faint odour of sulphurous acid. In warmer weather these crystals deliquesced and formed pearly white crystals of sodium pyrosulphite suspended in a solution of the acid sulphite. This experiment offers further proof, if it were necessary, of the unreliability of stock solutions exposed occasionally to low temperatures. The sulphites are especially sensitive to temperature influences, a saturated solution of sulphite of soda at 60° Fahr. depositing crystals to a large extent as the temperature approaches freezing.

The New Denayrouse Lamp.—There has been a considerable amount of newspaper paragraphing about this new illuminator, which is said to be able to increase the lighting value to be obtained from gas to the extent of 1500 per cent. The parragraph is to this effect: "In his lamp, M. Denayrouze employs a spherical-shaped metallic body, a mantle capable of being raised to incandescence. In the body of the lamp is fixed a tiny motor, which works a ventilator, and which receives current from a couple of small accumulators. The electrical energy required is said to be only $\frac{1}{3}$ volt. and $\frac{1}{10}$ ampère, and to be sufficient to force a current of air through the mantel, and cause the gas to burn with remarkable brilliancy. The burner is said to consume seven litres of gas per carcel, and lamps have been made having an illuminating power of 800 candle power." If such a lamp be cheap, it should be capable of revolutionising gas burning for light purposes; but we would rather wait and see it before pronouncing an opinion upon its merits.

Weather Forecasting.—In a paper recently published by us an estimate the very reverse of sanguine was given of the probability of any value attaching to future prognostications as to weather probabilities. We, however, had expressed a hope that some less glowing estimate might be justified, and our remarks now seem well grounded. We learn from the pages of *Nature* that its editor has received a volume of meteorological observations from the Rousden Observatory, situated on the borders of eastern Devonshire. Since 1883, a daily comparison has been made of the weather experienced at this observatory with the actual predictions from the Meteorological Office. From it we learn that the forecasts of wind and for weather, separately compared, were correct for no less than ninety-three per cent. of cases. There can be no doubt as to the correctness of the statement, for a description of the day's weather, &c., was entered in the place devoted to such records. A further table of comparisons for the last preceding year shows that the correctness of the forecasts had improved each year.

THE PHOTOGRAPHIC SALON.

The third Exhibition of the Photographic Salon, which opened this week, is disappointing in one respect, namely, the almost complete absence of such mystifying and eccentric "photographs" as partly helped to cover its two predecessors with a certain amount of ridicule. With few exceptions, which are quite undeserving of reference, this year's collection of work lays no entirely opaque obstacles in the line of sight of either the photographic or the lay public, when it comes to a question of getting to the inner meaning of the various exhibitors, and the result is a coherent and beautiful display of work, which in the main successfully appeals either to the intellect or to the emotions.

A careful study of the Exhibition persuades us that, good as it is, its principal distinction is to be found rather in an all-round high level of excellence than in any very marked individual or isolated triumphs. It is full of sound and sane photographic work, which would not be out of place at the Royal Society's Exhibition at Pall Mall—the Exhibition, by the way, which the Salon was instituted to "supplement." Moreover, Mr. Bryant has almost ceased from troubling, Mr. Maskell is at rest, Mr. Davison's salvation seems to be not altogether unattainable, and about two score gentlemen send photographs the like of which they sent last year and the year before, and thus the tale of the Salon Exhibition of 1895 is told—or almost. This Exhibition is just saved from the deadly sin of dulness by a few charming and refined studies of the female nude by two comparatively new men, and which are so good and successful as to suggest that there are great and undeveloped possibilities in this branch of work. Special acknowledgement is also extorted by Mr. J. Craig Annan for some superb portraiture treated with a fine sense of dignity and beauty in posing, and by Mr. Horsley Hinton, whose landscape work is probably the best in the Exhibition, as it is unquestionably the finest he has yet done.

There are, we think, more pictures hung than at the previous Exhibitions, due probably to the absence of very large work, from which it will readily be deduced that Mr. Bergheim is not showing.

It is pleasant also to observe the support given to the Exhibition by foreign workers, one or two of whom, as we shall presently take occasion to note, have turned photography to dramatic effect with wonderful success.

Our stock of superlatives just now is not very great, owing to the drain made upon it by the Leeds Exhibition, and, as we are also writing these lines within a few hours of the opening of the Royal Photographic Society's Exhibition, we must be economical, hence the necessity of our passing over many fine works in silence, and confining our observations to those which compel attention and demand reference.

One of the most marked and pleasing features of the Exhibition is the variety, excellence, and, as it were, plasticity of the figure studies; but here and there we notice what appear to us certain faults, which operate to make the works stop short of absolute success. An instance of this appeals to us in *The Country Maiden* (No. 6), by Mr. A. Buschbeck, the lady being placed with her hands behind her head, which strikes us as being bent forward to an extent that would not be ordinarily realised in nature. *A Study of a Head* (No. 28), by Mr. Demachy, is spoilt by the lines of the ribbons with which the sitter is adorned; these strike straight down the picture in a most assertive way. Mr. Alfred Werner's *Jadis* (No. 25) reminds us of a Reynolds-like effect in portraiture; it is a charming effort. Mr. Ralph Robinson this year devotes himself largely to figure composition with excellent results. His *Boss of the Show* (No. 53) is a truly clever and humorous bit of juvenile life. A smiling urchin is standing assertively in a doorway, and a small child at his feet is looking up at him with mingled respect and wonderment. We have seldom seen a more natural and lifelike rendering of a child's figure. Unquestionably this photograph should find its way into the illustrated papers and attract popularity. On the other hand, Mr. Robinson, we think, misses his mark in *Why not be Friends?* (No. 59), a child trying to reconcile a cat and dog. The child's face is devoid of animation or interest; but it is only just to the exhibitor to concede that this, as well as several other subjects he has selected, offers difficulties of no common order. The attentive and listening attitude of the child in *The Old Clock* (No. 63) are well suggested. *Dropped Stitches* (No. 79) is the title given by Miss Stoddart to a full-length study of a lady, with sewing in her hand, who is gracefully posed and forms an attractive picture. So, too, we like the sentiment of *The Last Chapter* (No. 84), by Rev. F. C. Lambert. It represents a lady, with a book, seated by an open window, the easy disposition of the figure and the softness of the effect lending very great charm to the study.

For total disregard of conventionality, as well as in the success that has crowned his endeavours, Mr. Henry A. Collins is to be congratulated. His *Startled* (No. 195) is the nude figure of a woman in a wood, looking away from the spectator as if some sound had arrested her attention. Save perhaps for excessive hardness in the high lights on the figure, little fault can be found with this picture, which has a companion in *Ebb Tide* (No. 196), a semi-recumbent nude figure reclining by a little rivulet in a wood. The rendering of the figure is perfect in modelling and softness, with the exception, perhaps, of the left foot, which looks too thin and chalky. Two works by Mr. C. Puyo are of uncommon interest and cleverness. *Nocturne* (No. 285) is the seated figure of a nude woman, with her hands raised above her head. But for a bright light, which strikes down at an angle and tips her head and hands, the figure is wholly in shadow. The print is of a deep red tone, and, the figure being perfect in roundness and realism, the effect is undeniably successful. *Vengeance* (No. 299), also by Mr. Puyo, is highly dramatic in its intensity. A woman, Theodora, perhaps, armed with a murderous-looking blade, is seen making her way to an inner apartment, resolution being written on her face and showing in the lines of her figure. It reminds us of Bernhardt in one of the tragedies in which she finds scope for her display of tigress-like hatred of a false lover or a rival.

Each of the photographs we have mentioned in the three preceding paragraphs contains some feature that not only sets the imagination at work, but here and there will be found full of suggestion and help by the student, who will assuredly see in them much to inspire and interest him.

A few words now about the portraits, in which the Salon, it goes without saying, is very strong. But we are not sure that, with the exception of Mr. Craig Annan's work, anything is shown which excels last year's examples. In at least two cases we find ourselves totally unable to understand the style of treatment selected. Take, for instance, Mr. W. A. Cadby's *Study of a Head* (No. 47). It is the head of a lady, printed, it would appear, in red carbon, and seen, so to speak, through a film of light fog, to give its peculiar mistiness a photographic name. On what grounds anybody can admire or appreciate an effect of this kind we do not know. Then Mr. Briant, in a kindred subject (No. 274), adopts the same style of vagueness and indecision which is strongly accentuated by a *Portrait* (No. 273) on enamel by Mr. A. L. Gosse, hung just below it, a bold, well-defined study of an old man's head. Of course we may be told that in the one case idealisation steps in to countenance this "breadth of treatment" in portrait studies, but try as we may we cannot, as the saying goes, "tumble" to this description of work, and we do not think it will ever have much of vogue. We must, as hitherto, congratulate Mr. Hay Cameron on the refinement and delicate beauty of his portrait work (Nos. 38–42) but we wish he had not adopted such gaudy metallic-looking frames. Mr. Ralph Robinson's portrait of *H. P. Robinson, Esq.* (No. 81) shows the latter gentleman seated in a natural position and attitude by a table, and the likeness is not only admirable, but the arrangement is a simple and unaffected one, and the effect most pleasing. Of Mr. Fred Hollyer's portraits, that of *Bernard Evans, R.I.* (No. 74), is a freely treated piece of work, suggesting jollity and *bonhomie* as characteristic of Mr. Evans. The same gentleman's *John Ruskin* (No. 72) gives a side view of the venerable art critic seated against a background of deep shadow. Mr. W. Crooke has several of his "old engraving"-like looking portraits of Scotch celebrities, executed in his usual careful and conscientious style; we are surprised that Mr. Crooke has not found imitators of his method. Come we now to three or four of Mr. Craig Annan's masterly works, which it is a pleasure to contemplate. How unaffectedly and naturally the figure is posed in *A Lady in Brown* (No. 161), wherein the lady is standing full length, looking partly away from the spectator. Again in *Sibylla* (No. 167), the head and shoulders of a simply attired lady, the same perfect command over artistic disposition is shown, and the unconstrained position of the head is of a most lifelike conviction. *A Little Princess* (No. 171), a full-length study of a delightful child, attests in a different manner Mr. Annan's innate skill in imparting a wonderful sense of actuality to the subjects he portrays. Mr. Annan's prints appear like first-class photogravures, and the whole of his work here, only to two or three examples of which we have referred, stamps him as of very great creative and executive skill.

The foreign contributors to the Salon send invariably good landscape work, but such a subject as *Reflections* (No. 23), by M. Bremard, is not only hackneyed, but uninteresting, especially as in this case, where the reflection is virtually a complete duplication. Mr. George Davison's large study of *Thistles* (No. 100) is a bold and vigorous piece of work, to which nobody can take exception, the well-filled field of wild and varied weed growths forming a capital subject, capitally treated. If this be breadth of effect, we are prepared to be reconciled to it, which is more than we can say of two little excerpts—*Weed-burning* (No. 114) and *Diana Pond* (No. 114*)—by the same gentleman. The first of these may certainly suggest that the two figures against the white mist are burning weeds, if you bring a plentiful supply of imagination to bear upon it; and the other, depicting trees on a belt of water, is equally broad in treatment and uncertain in effect. Mr. Davison, however, strikes new ground with *Southend Pier* (No. 95), a night effect with the lights showing, and *Between the Lights* (No. 105), also a view of the pier by twilight. These are not ineffective little studies. He has a large and vaguely expressed work, *Fowey* (No. 91), with craft in the harbour, which may captivate some tastes, but which we are unable to appreciate. Colonel Gale, in *Evening's Glow* (No. 120), gives a softly rendered study of the advance of evening over a pretty piece of landscape, which is not characteristic of his usual crisp method; this finds exemplification in two other charming views, *An Autumn Afternoon* (No. 121) and *Across the Downs* (No. 122)). We entreat Colonel Gale not to give up his individuality in exchange for the passing fad of diffused treatment. Of Mr. Horsley Hinton's works

two stand out as remarkably fine and attractive in theme and execution. We allude to *Day's Decline* (No. 133), in which the composition is faultless, the sun from the cloudy sky lighting up the little bush-lined stream with the gleam of departing day. Mr. Hinton has, as it were, "massed" his materials, so as to produce well-balanced effects of boldness and softness, and the total effect is a grand one. A companion picture is *Day's Awakening* (No. 141), the morning sun casting a characteristically hard bright light along the little stream that trickles over the broken ground. Both works are splendid examples of good landscape work. The figures of the two women in Mr. F. Coste's *Potato Gathering* (No. 156*) are cleverly placed with an eye to the best effect, that is, at a well-judged distance from each other, so as to show in pleasing perspective. We do not think Mr G. H. James, with *The Incoming Tide* (No. 164), is very successful the shore, waves, and sky appear to us to be in such a uniformly low tone that it makes it difficult to separate the sea from land. *Just One More* (No. 206), by Mr. J. G. Nicholson, is supposed to be a cricketer taking his last ball in the twilight. We say "supposed to be" advisedly, for its crudity and nebulosity are indescribable. We are informed that it was specially hung to afford us an opportunity of jumping upon it, as we expressed a desire to do with several "things" last year. We shall preserve our boot leather uninjured.

We should have preferred Mr. Wellington's *When Daylight Dies* (No. 180) if it had been a little less dark or printed in a warm colour, and are sorry that Mr. Burchett's *Study of Sunset* (No. 208) shows little or no separation in the tones of the foliage and foreground; otherwise it would have been more effective. The same gentleman's *Sunshine and Shadow* (No. 211) is a pretty study of a lady seated in the open, the play of light and shadow being very skilfully rendered. To a study of *Sheep in the Shade* (No. 215) Mr. Burchett has imparted what is probably meant for an atmospheric effect, but might also appeal to some minds as superfluous mistiness.

One of the most realistic little pieces on the walls is Mr. Lintott's *Evening—Winter* (No. 249), a view of snow-covered houses. Besides a really fine *Portrait of the late Henry Moore, R.A.* (No. 267), head and shoulders capitally posed and lighted, Mr. H. P. Robinson is represented by several grand land and seascapes. The principal one is *At Sunset leaps the Lusty Trout* (No. 258). A fisherman is plying the gentle craft at a little stream against a wealthy background of trees, the figures of two women, rustically attired, being seen idling in the middle distance, a rich sky of evening glowing over the picture, which is a beautiful and thoroughly harmonious effort. Mr. Robinson's other exhibits include *Off Arran* (No. 250), a bold sweep of clouds over hill and sea. Mr. Karl Greger's landscape work exhibits him at his best, but his representation of *Dordrecht Cathedral* (No. 262), with the reflection in the water, though photographically good, has not, so far as we could discover, much artistic merit in it. For commonplaceness of subject commend us also to Mr. Quentin's *Billeting Ticket* (No. 310), a number of tame soldiers grouped about some women at the door of a house. Recalling some recorded episodes of the Franco-German War, what a fine subject a billeting incident is capable of supplying!

We might go on for a long time writing about an Exhibition in which, for the first time at the Salon, we have taken unalloyed delight, but no useful purpose would thereby be served. Again, to mention the names of those who have sent work which does them and the Exhibition every credit would be equivalent to making lavish extracts from the catalogue, so that our enforced silence must not be construed in any wrong sense. To sum up, the Exhibition is undoubtedly the best yet held by the Salon, and nothing that is written of it can do it justice. The most favourable thing therefore we can say of it is to advise our readers to go and see it, to study it, and think of it. Pictorial photography is shown at its best and highest developments, and, Heaven be praised! the extreme wing of the "new movement" is for the present silent, if it is not actually abashed, by the ridicule it has deserved and received.

PHOTOGRAPHS FOR BOOK ILLUSTRATIONS.

Factory Interiors.

There is little doubt that, since the almost universal employment of half-tone blocks for the purpose of illustrating books and trade catalogues, photographers have, to a considerable extent, had a somewhat new field thrown open to them, and such are now frequently called upon to take photographs of many particular subjects that, in the past, were deemed outside the pale of practical photography.

Within the last few years, there is, no doubt, public companies, as well as large private business firms, have become more than ever alive to the advantages which accrue to advertising, and, at the present time there is an undoubted leaning on the part of such towards the circulation of illustrated pamphlets or books as being the best medium for such trade advertisements.

"If a thing is worth doing, it is worth doing well," is a maxim that has been found especially applicable in advertising, and hence the elaborately got up and costly productions we now see in the shape of illustrated trade catalogues, that business firms scatter so lavishly among their customers and the public generally.

In the production of these publications there is, no doubt, photography plays an important, if indeed not really a primary, part, for in a very large measure the success of the publication depends upon the illustrations, and these are, of course, in their turn, dependent upon the success or failure of the photographer to produce suitable pictures for the purpose of yielding good half-tone blocks.

During the last three years it has fallen to my lot to photograph many of our largest industries for this purpose, and this has brought me face to face with certain views or subjects that, on first thoughts, many an operator would have deemed quite beyond the capabilities of being dealt with by the camera, but which on mature consideration were found amenable to the modern sensitive dry plate, for it is really wonderful what can now be accomplished in the way of photography, when every convenience is placed at a photographer's command and a reasonable amount of expense is not grudged in the way of overcoming seeming difficulties.

No doubt there are many instances where insuperable difficulties will be met with, for it will be often found that principals frequently desire to introduce or include in the illustrations some particular item that is quite beyond the limits of photography; but still, on the whole, when a photographer enters into this kind of work with energy, it is marvellous what he will be enabled to accomplish. In the following remarks I shall endeavour to point out a few of the more important points to be considered when undertaking this kind of work.

One of the first difficulties an operator will have to contend with is almost certain to be that of having to deal with the insertion of figures of workmen or workwomen in the various interiors that they are called upon to photograph, for such, no doubt, materially aid in giving effect to a strong feeling of naturalness in cases where such are regularly employed in workshops and all situations where labour is largely employed. In very many instances, however, the including of such figures will prove to be a matter of the utmost difficulty, for but very few workshops or factories will be found where anything like suitable surroundings can be had to permit of the workmen being photographed at their benches, or engaged in their regular routine of labour. In making these remarks, I know quite well there are exceptions where an operator will fortunately be able to secure some particular "close study" of machinery with its attendants in well-lighted situations that at times are easily dealt with; but, in the great majority of instances, employers want their illustrations to yield the "big" or "vast" impression; and, of course, this means the inclusion of numbers of figures scattered over not only a broad, but likewise a deep area of space, and every photographer knows that to bring into fairly good definition, not only the foreground but likewise the distance, means the employment of a very small stop when working on subjects at such close quarters, and the employment of a small stop means the giving of a long exposure, especially when operating in workshops and such places where but only a poor supply of daylight enters.

These exposures, even with the fastest of modern plates, will be found to be so prolonged as to be quite beyond the power of the workmen keeping steady during such exposure.

Luckily at the present day, when amateur photographers will be certain to be found in every large business concern, this difficulty will be more or less acknowledged at the outset. Still there will be at times those met with who point to some production of a similar kind as proof that such has been accomplished by others, and who, in their ignorance of the capabilities of photography, can hardly be brought to understand that a very great difference exists between the insertion of figures in confined corners with good light at command, and such situated in places where only poor light and great depth of space has to be dealt with.

To attempt subjects of this latter kind is certain to end in failure, for the reasons a ready assigned, and it is far better to plainly state such at the outset, and, if eventually the figures must be included,

have recourse to an artist drawing such in from a scale which may be procured by exposing a plate on the same view and in which such workmen are placed as naturally as possible. This will be a true guide to a clever artist who draws them in on the face of the print eventually specially furnished for such an object. The finished production from such a source then becomes a combination picture, made up by hand in so far as the figures are concerned, photography, of course, yielding the view. Very many of the most successful book illustrations are produced in this manner.

In all cases, however, when it is possible that such figures can be dealt with by the camera alone, no doubt a more natural result will be attained.

In some situations exposures of hours will be required to bring out detail in the darkest portions, whilst in others from a few seconds up to several minutes will be found the correct timing. It takes a lot of experience, and frequently the sacrifice of a few pilot plates, to gauge anything like a fair idea of the necessary time in exposure when working in such places as factories, warehouses, and similar places, hardly any two of which will be found alike, some being lighted from the roof alone, others by windows all round the sides, and in other instances both from the roof and the sides.

For the purposes of book illustrations, it will be found that such photographs are required as will show not only plenty of detail, but one of the chief essentials is good contrast; poor, flat, miserable, over-exposed productions are only fit for the dust basket, hence the importance of the utmost attention being given not only to correct exposure of the sensitive plate, but likewise to the selection of the particular hour of the day when the lighting is from that direction which just yields the utmost amount of brilliancy and contrast.

It has become fashionable in these latter days of photography to waste a good deal of time and energy in the discussion as to the capabilities of certain alterations in the compounding of the developer, as being able to produce more or less vigour in the resulting negative, whilst others, on the other hand, maintain that there is no such limit attainable by means of alterations in the developer, alleging that such is solely attributable to the correctness of exposure. Doubtless this is true to a very great extent, but I always thought that those who advocated for or against either of the above factors quite ignored what was really the primary essential, viz., "the lighting," for what can any one do with regard to the gaining of density or contrast in a negative either by development or exposure provided the lighting is wrong?

As the lighting is, so will the result be, provided the after-manipulations of the plates are carefully carried out.

If you have no shadows in contrast to your high lights in your view, depend upon it no correctness of exposure or compounding of the developer will produce a high light or a shadow where such did not exist in the original. Neither will under-exposure yield such contrast as many suppose.

The attention to the lighting of these subjects is of the very first importance, and an hour or two specially devoted to this study alone is well spent, for such will go a long way towards the production of photographs in which the utmost amount of pluck and vigour is present, and which is so essential to the production of good half-tone blocks.

T. N. ARMSTRONG.

HOW I WAS NEARLY HAD.

A WELL-TO-DO man, such as I own myself to be, is encompassed by snares and pitfalls of which the more ordinary being who has to work for his daily bread has no conception. From noon until eve, summer and winter, he is beset with applications for help—help meaning money. His clients are without number and without conscience; there is the embarrassed tradesman in temporary want of 200*l.* to complete an order, for which he is prepared to deposit security to four times that amount, and to pay cent. per cent. interest into the bargain. There is the dealer in stocks, who offers to make your fortune if you will only give him sufficient "cover." There are the charities, local and general; the societies for encouraging this and abolishing that; and the varied schemes of faddists, whose mission on this revolving globe is to turn it inside out.

My thoughts had taken this turn owing to something said to me by my friend Brown. We had dined together at his Club, and were leaning back in luxurious chairs, smoking our cigars and sipping coffee. "By the way," said he, "I can put you up to a good thing—that is to say, if you want to make a few hundreds easily."

I had so often been put up to good things, and lost instead of gained by them that I did not at once jump at this tempting bait. Here is another pitfall, thought I; but, all the same, I asked for details, for I did not want to offend Brown.

"Well, you see," said he, "I myself don't know much about the thing except that it has something to do with photography. I must introduce you to my friend Snooker—awfully clever fellow, Snooker! knows a thing or two, I can tell you."

"And who is Snooker?" I asked.

"Snooker is a financial agent or company promoter. It was he who launched the Metropolitan Electric Mangle Organization Scheme, for turning all the mangles in London with the power developed by the Charing-cross fountains."

"But, surely," said I, "that scheme was a failure."

"From the public point of view, yes; but Snooker and his syndicate netted 35,000*l.* over the enterprise. Devilish keen hand, Snooker 35,000*l.*! Just fancy!"

"Has any other great scheme been similarly brought to—ahem—success by Mr. Snooker?"

"Oh, yes. There was the Company for carrying Belgian coals to the Tyne. Snooker never said exactly what he cleared out of that liquidation; but I know he bought a fine freehold property at Brighton immediately afterwards, and contributed largely to the local lunatic asylum."

"In compliment to the shareholders possibly," said I. "But what," I asked, getting rather tired of Snooker and his past doings, "can you tell me about this latest good thing in which your friend is interested?"

"Well, as I said before, I don't know much about it, but can give you a rough idea of the position of affairs. Pass the matches, please." With a due amount of stoking and the emission of much smoke, Brown's tongue at length got to work, and briefly the story of the good thing was this:—

Snooker by some means had unearthed a needy Frenchman, who possessed a wonderful secret process for producing photographic pictures easily and quickly, independent of weather or any of the usual conditions attaching to photography. He had installed this Frenchman in rooms in London, where he was producing specimens of his skill. The Frenchman kept his secret rigidly to himself, and there was one room where he did most of the work, a room which was never entered by any one else. He kept the key of this mysterious chamber, and at intervals brought forth from it certain plates, which could be made to yield pictures in the common printing press. Snooker, it seemed, was paying this Frenchman a few pounds a week until a company could be floated to exploit his marvellous invention.

I became rather interested in the affair, for I knew something about photography, and I felt enough curiosity about the personality of Snooker to wish to be introduced to him. I therefore left Brown to arrange an appointment, and three days afterwards we went together to a demonstration of the new process.

The place was in the heart of the City, up four flights of stairs, each floor having its characteristic smell of spice, tea, or other produce. On the topmost door was writtten, M. Vibort, and, in another minute, we entered, to find ourselves in the presence of the famous Mr. Snooker and three friends, who were introduced to us as Directors of the Vibert Company. Mr. Snooker was tall, with long grey whiskers, and faultlessly dressed. He was evidently the leading spirit, the others having the aspect of respectable City men—mere "guinea pigs."

The room was a large one, and at the farther end was a door marked "private," which I rightly conjectured to be the Frenchman's secret den—of which I had heard so much from Brown. After Mr. Snooker had expatiated upon the wonderful prospects of the process, and the Company formed to exploit it, its simplicity, and so on, he directed my attention to a number of specimen pictures hanging round the walls, and asserted that the plates had all been prepared on the spot and had been printed from in the very press that was standing close by. This was an ordinary lithographic press—a workman standing near it with roller and ink ready to furnish proofs at demand. Mr. Snooker further informed me—I may mention that he was kind enough to address most of his remarks to *me* personally—that M. Vibort was at that moment in his dark room finishing a fresh plate which would in a few minutes be ready for trial. Almost as he said these words the inner door opened, and M. Vibort—a short man with black hair, standing up like a scrubbing brush—presented himself. He held in his hands a glass plate, which, with a bow such as only a Frenchman can make, he handed to Snooker; and, after each of us had had a look at it, it was given to the printer, who proceeded to roll it up with ink. Snooker all this time kept on talking of the wonderful simplicity of the process, and compared it with the slow method of printing by the sun's aid, the advantage a production in printing ink must have in the matter of permanence, and so on. The inking arrangements being completed, a proof was pulled by the printer,

and a very good proof it was. Other proofs were printed at intervals of a few minutes, and the demonstration generally may be said to have been successful. At Snooker's suggestion we now adjourned to a neighbouring hotel, where refreshments were ordered, and we discussed the prospects of the Vibort Company, Snooker doing most of the talking. He produced a draft prospectus, from which it appeared that the capital was fixed at 70,000*l.*, and ended, to my utter surprise, in proposing that I should allow myself to be nominated Managing Director!

Now, some persons would have been flattered by this suggestion of Mr. Snooker's, but I wasn't. I knew a little too much of the ways of company promoters of the Snooker type to believe in them, and in a minute pictured to myself Snooker vanishing into space with his pockets full of gold, and the Managing Director left alone to meet the inquiries of impoverished shareholders. Moreover, I had seen enough of his so-called secret method, and knew enough about photographic processes generally to hazard a guess that this one was nothing more nor less than collotype pure and simple; but for the moment I kept my own counsel.

Mr. Snooker, having failed to induce me to become Managing Director, began to sound me as to the amount of money I was prepared to invest in the Company, a question which I parried by asking how much the Frenchman was to have out of the 70,000*l.*, and how much Mr. Snooker himself was to receive. I also asked some other awkward questions regarding the disposal of this large amount of money, but could get no direct answer to them from Snooker, who gradually dropped his politeness, and lost his manners as well as his temper. Things came to a head when I ventured to assert that I knew how to produce pictures like those he had shown me, without the purchase of any secret process, and hinted pretty broadly that the whole thing was a fraud. We parted in anger, and I have seen neither Snooker nor Brown since. The Vibort Company's shares, I may mention, are not yet quoted on the Stock Exchange.

Moral.—"A little knowledge is (not always) a dangerous thing."

THE LEEDS EXHIBITION.

Under the auspices of the Leeds municipality and the Leeds Photographic Society an Exhibition of photographs, process work, and "black-and-white," was opened on Tuesday last, September 24, and will remain accessible to the public for about two months. The civic authorities have evidently entered very cordially into the undertaking, and have set aside four fine galleries in the City Art Gallery, a noble and well-filled pile of buildings, for the purposes of the display which thus gains every advantage that effective hanging, good lighting, and congenial environment can impart to it.

The Black-and-white Section, to which it is beside our present object to do more than briefly refer, is made up of selections of illustrators' work, contributed by Messrs. Virtue, Messrs. Cassell, The Autotype Company, *The Idler*, Messrs. Seeley, and others, with most of which the public, through the medium of the pictorial press, has already become acquainted. Such men as Railton, Greiffenhagen, W. H. Margetson, G. C. Haité, W. L. Wyllie, Fulleylove, H. Ryland, Pennell, Brunet Debaines, Dudley Hardy, are represented by original drawings and sketches, and Mr. Phil May and Mr. F. C. Gould also send work, the one some of his humorous sketches, the other a few of his biting political cartoons. Undoubtedly this section of the Exhibition will be an amusing and popular as it assuredly will be an interesting one; but if, side by side with a few at any rate of the original drawings, the reproductions could have been placed, the section would also have been made instructive.

Colonel Gale, Mr. Sutcliffe, and Mr. Geddes acted as Judges of the other sections of the Exhibition, the last-named gentleman adjudicating in the process division. The distribution of the awards struck us as having been made with very nice judgment, considering the magnitude and, so to say, the "mosaic"-like nature of the Exhibition, which is split up into eight sections.

Section II. Photo-ceramics.

This Section is a small but a decidedly good and interesting one. The Midland Photo-Keramic Company show specimens illustrative of the adaptability of enamelling for china ware and are awarded a silver medal for a second exhibit comprising hard glazed ceramic pictures on tiles, plates, &c. These include some excellent portraits. The work of Mr. C. Brookhouse, large enamels on tiles produced by the dusting-on Process, suffers somewhat from numerous small surface spots, due probably to bad retouching or none at all. The bronze medal in the class is awarded to Messrs. Morgan & Kidd, whose small work, entirely portraits, produced by the dusting-on process, is uniformly good and flawless, one plaque, that of a lady's portrait, being in richness, and colour, softness, and effect probably not excelled in the entire section. Mr. George Pendry, of Nottingham, also shows tile work, with rich warm tones, and Mr. J. S. Teape, a patient and indefatigable worker in so many branches of photography, sends a series of enamels on copper, in various colours, and of great delicacy and beauty. The specimens sent by Messrs. Tunny, of Edinburgh, bear looking into; they are little gems in technical beauty. On the other hand, a small series by Messrs. Willis & Co. is, to our mind, spoiled by some very gaudily coloured specimens.

Section III. The Champion Class.

This is neither a very big nor a very good class. Silver medals are given to Mr. W. Thomas for *Sunset in the Pool*, to Mr. Kidson Taylor for *A Hampshire Home*, and to Mr. R. Terras for *The Ghost Story*, all of which works are thoroughly well known to our readers. The class includes Mr. Dennison's small photogravure, *In Salhouse Village*, that was medalled last year at Pall Mall, Mr. P. S. Lankester's *Greek Study*, Mr. Coath's humorous puppy and child studies, and excellent work by Mr. Wallace Heath (whose *By Quiet Streams* is a beautifully defined and exposed little view, perfectly printed), Mr. R. S. Webster, Mr. Keighley, and others.

Section IV. Lantern Slides.

In this class the exhibit of the Sciopticon Company, which consists of seventy-one slides of various subjects, including flowers, architecture, landscapes, statuary, at once secures attention by reason of their wonderful beauty and fine qualities. It is to be regretted that the Woodbury process is not more frequently employed for this kind of work. Mr. H. B. Hewetson shows a set of forty-eight slides, illustrating Moorish scenery and figure subjects, of somewhat unequal merit, atoned for, of course, by their interest, a remark that applies to an instructive series of fifty by Messrs. Reynolds & Branson, showing life in and about a Yorkshire coal mine. We congratulate Mr. Bingley on his set of twenty-four architectural and landscape subjects, upon which even a photographic journalist can look with pleasure, their brilliancy, crispness, richness of tone, and uniformly good gradation meriting high praise. Among the capital set, by Mr. J. H. Walker, President of the Leeds Society, we detect some reminiscences of Shrewsbury; his architectural and seascape subjects are singularly well chosen and executed. The work of Mr. H. P. Atkinson is extremely good, and superb definition characterises the microscopic slides of Mr. Ernest Jones, of Rhyl. We do not like the oval-shaped masks of a series by Mr. Ernest Raper: the shape is not suitable for projected images. Mr. J. J. Field's cloud and flower studies are of much beauty, and the remaining exhibits are such as to make the class a noticeably even one.

Section V. "Photographs."

Very nearly four hundred photographs are placed in this section (or class), which, it will be seen, is a very big one. The class, in point of size, and in a sense, of quality, would make a very good Exhibition in itself. It is hung in the South Room, a magnificent gallery of grand proportions. It includes all sorts and conditions of photographs; some of the very best in point of artistic and photographic quality, some (oh, so many!) of what we should call the middling or commonplace kind, and some of the worst or crudest productions of the camera. Under such circumstances the task of criticising in detail so variegated a collection would necessarily assume portentous dimensions, and we therefore engage ourselves to do no more than select a few of the exhibits for remark and comment. If we hazard the opinion that the Exhibition would not have suffered by the exclusion of a great many of the photographs that have been allowed to remain in it, we are moved to do so by no other reason than that the works in question challenge objection by the least cultivated member of the public as handsomely illustrative of the way in which photographs of the commonest subjects should not be taken, developed, printed, toned, mounted, or framed.

It is four years since an open Exhibition was held in Leeds, so that we were prepared to renew acquaintance with some old exhibition friends on the walls of the City Art Gallery, and were not disappointed. Mr. Alexander Keighley, for example, has exhumed no less than thirty-eight of his works, and has quite a one-man show of figure studies, land and seascapes. In one of his figure studies, *Firelight Fancies* (a woman seated by the fire and gazing reflectively into it), he nearly succeeds in producing a fine piece of work. Lighting, arrangement, and technique are good, but the face of the woman is expressionless, and her attitude stiff. Mr. C. R. H. Pickard, evidently a clever worker, is awarded a bronze medal for a marine subject, *Low Tide*, depicting yachts in a bay, but, among his other exhibits, has one, a bromide enlargement, *Head of a Short-horn Heifer*, that is absolutely devoid of interest in any respect save that of size. Mr. Pickard will forgive us the expression of this opinion, we hope, and especially as the commonplaceness of this wretched heifer's head is cruelly accentuated by the near presence of some of Mr. F. M. Sutcliffe's pictorial gems, notably his charming sheep study, *Spring*, and other pictures sent "not for competition."

A veteran photographer, Mr. F. Howard, sends a little study, *The Fuel-gatherer*—an old woman in quest of twigs and wayside scraps for the fire. The figure of the aged dame is naturally posed, and the effect of the picture a good one. On the other hand, a landscape, by Mr. Percy Sheard, gives us cause to be puzzled. It is a well-composed view, looking across a pretty stretch of country to a village, above which the church tower stands out against the evening sky. In the foreground is a cart drawn across the road. The photograph is called *The Curfew*. Now, why *The Curfew?* why the presence of the cart? and why should Mr. Sheard spoil a well-executed bit of work by such a commonplace and inharmonious object as a cart in the foreground, and a meaningless title? We

invite Mr. Sheard to look at the works of a master of landscape, Mr. Kidson Taylor, who has some gems of congruous composition hard by *The Curfew*. Mr. W. England shows several small Swiss views, which he has vignetted. Vignetted landscapes, however, do not meet with much favour nowadays, and the rarity with which they are produced makes them look all the more old-fashioned and, as it were, artificial. Probably we do not exaggerate in saying that every offence against the elementary canons of pictorial photography may be detected at this Exhibition. For instance, Mr. F. H. Burton, an experienced and cultivated photographer, spoils one of his exhibits, a capital view of Whitby, by having a boy in the foreground staring straight into the lens. So, too, Mr. W. H. Cotterill also sins in his work, *Forty Winks*—an old fellow having a quiet nap. The figure of the man is easy and natural enough, but the cottage "interior" is obviously, nay painfully, artificial. As for the figure or *genre* subjects, it really seems, to judge by the examples here shown, that photography is powerless to avoid imparting stiffness, woodenness, unreality, stiltedness, "wax-dollishness" to the participants in several mede-up episodes depicted in this gallery. Take, for instance, one series, shown by Mr. J. H. Coath, a prolific contributor. It is called *Sea-saw*, and it narrates the adventures of three children—two boys and a girl—at that exciting pastime. The photography is splendid, and the figures are not unskilfully posed; but they are lifeless and motionless, and their faces might have belonged to wax models. Our old friend, the sixty-mile-an-hour express, crops up again in a photograph by Mr. W. J. Barker; but Mr. W. J. Warren has succeeded in making an express train the subject of a *picture*. It is called *The* 8.20 *Express*. The train is shown disappearing toward the darkening distance; the impression of evening is well suggested, and a simple and uncommon theme like this is made to successfully appeal to one's appreciation of pictorial effects.

It is to be hoped, for their own future progress in photography, that several of the contributors to the Exhibition will visit it, and compare their own efforts with those of other competitors. There are about a dozen ladies and gentlemen to whom we should like to present a *Beginner's guide to Photography*; but, the times being hard, the next best thing we can do is to advise them to buy a copy themselves, as well as study the exhibits shown here of such photographs as Mr. Sutcliffe, Mr. Court Cole, and Messrs. Bedford Lemere (architecture); Mr. Kidson Taylor (landscapes—for one of which, a beautiful *Autumn*, he takes a medal); Mr. S. A. Warburton, who shows some fine Isle of Man views; Mr. S. N. Bhedwar; and Mr. James Bacon, whose portrait work is of marked uniform excellence, unlike that of many workers, which varies in quality a great deal.

Mr. Harold Baker's soft and charming portrait studies are not the least beautiful in the Exhibition, and he is singled out for a medal. Mr. W. J. Byrne, who we are glad to welcome back to the exhibitions, is here perhaps most successful of his various contributions, with a large direct portrait of the late Dr. W. C. Bennett—a fine bit of work, natural in the prose, lifelike in effect. The cathedral interiors of Messrs. S. B. Bolas and Co. are exquisitely done, and one of them, *The North East Isle, Ely Cathedral*, is medalled. In beauty of light and shadow, and fineness of detail, it is unrivalled. Some amusing studies of cats dressed up are shown by Mr. Coath. *Roses* is the title of a study of a lady seated against a traceried window, by Mr. Barraclough. In this, and a companion picture, a lady reading *An Old History*, the style and manner of the late Mr. Frank Dicksee, the painter, are suggested. The effect is delicate and good, but the consequence of employing a very rough paper, is, that the face of the lady does not stand out from the background as it should. Mr. Pringle sends four capital figure studies, one of which, *Savonarola*, is wonderfully suggestive of what we can imagine the ascetic but vigorous monk, round whom George Eliot partly weaved her great romance "Romola," to have been. The other prominent contributors to this Section are Mr. Craig Annan (who sends some of his last year's Salon exhibits, such as *A Utrecht Pastoral*, &c.); Messrs. Chaffin; Mr. John Stuart, Glasgow (views on the banks of the Kelvin, at Church Stretton, Ludlow Castle, and Shrewsbury); Washington Teasdale (local views and studies); H. Spink; The Autotype Co.; W. Thomas; H. W. Bennett; T. M. Brownrigg (scarcely up to his best form); R. S. Webster, &c.

The Process Sections.

The five Sections (VI. to X.) devoted to the Process departments are, perhaps, not so large or so good as was anticipated, but will repay study.

A small portion of the west room is set apart for a show of reproductions of well-known pictures in platinum, bromide, carbon, &c. contributed by Messrs. Annan (*The Burgomaster's Wife*, by Hals, &c.), Mr. Hollyer (heads by Burne Jones), the Autotype Company (*The Old Téméraire*, &c.).

Examples of photogravure are sent by Mr. Dennison (whose introduction to the catalogue, descriptive of the various photo-mechanical processes, is a model of conciseness), the Rembrandt Intaglio Printing Company, the Autotype Company, Mr. Harold Baker, J. C. Drummond & Co., T. & R. Annan & Sons. Mr. Dennison is among the medallists in the Section, being successful with the reproduction of a negative of a pleasing little view on Lake Geneva.

The Half-tone Section is so small as not to call for comment. Messrs. Raithby, Lawrence, & Co., Messrs. J. C. Drummond & Co., Messrs. Hare & Co., are among the exhibitors. Collotype monopolises Section VIII., a small one, Mr. Graham Glen being awarded a bronze medal for some charming little pictures of the Christmas-card type. Excellent work is also shown by Messrs. Morgan & Kidd and Messrs. J. C. Drummond.

Colour processes of various kinds are included in Section IX., specimens of chromo-typography and chromo-callotypy being exhibited by Messrs. Raithby, Lawrence, & Co., the Heliochrome Company, Messrs. Hare, Messrs. S. B. Bolas & Co., &c.; and the concluding Section (X.) is devoted to line work in collotype by Messrs. Bolas and others.

The Apparatus Section.

The exhibits in this section are few, and come exclusively from local houses. Messrs. Pearson & Denham have a handsome case well stocked with a selection of apparatus of the most modern types, including Ross lenses, Kodaks, Frenas, stand cameras, and other photographic apparatus for amateur and professional use.

The old-established house of Reynolds & Branson also makes a well-chosen and complete display of apparatus and chemicals arranged in cases—stands, shutters, cameras, lenses, dark-room requisites, in great variety, being shown. The Taylor Drug Company and Mr. Watkinson also have stands.

There is something in this Exhibition to suit all tastes, and it is well calculated, by its diversity and variety, to prove both of interest and profit to photographers and the public, large numbers of whom, it is to be hoped, will avail themselves of the opportunity of visiting it, thus giving the efforts of the Leeds Corporation and the Leeds Photographic Society their most suitable reward.

PHOTOGRAPHY: PRACTICAL AND ARTISTIC.

[Ohio Convention.]

Photography, to the observant mind, is one of the greatest anomalies on the face of the earth. It is at once a profession and yet a business, a vocation, and yet a source of amusement to thousands of amateurs; a science, and yet not a scientific occupation to but few of its votaries. The student is ever discovering new wonders in it, while the ordinary person dares not wander further than a printed formula. Great men have struggled with it, while poor men are muddled with it. To the chemist, it means the most painstaking and delicate of work to unravel its mysteries; to the artist, unlimited study in light, shade, posing, and detail; to the business man, properly armed with the requisite education, an assured means of livelihood. With a full knowledge, then, of the methodical nature of the chemist's labours, the never-ceasing round of study that must envelop the life of an artist, and the systematic manner in which every successful business must be conducted, have I chosen what seems to me a most trenchant subject, and one which, with your kind attention, I will endeavour to deal with in detail.

I.—Practical.

To be a successful man, the photographer of to-day must be practical in every branch of his business, and in none more so than in the financial. The mercantile world offers us thousands of examples of what good business management will do. Banks, railways, insurance companies are run upon an absolute system, or else they do not run at all; and, to an equal extent, is every business venture, of whatsoever character, compelled to adopt some definite course of action in order to reap that reward which we are all after. And yet the land is full of galleries that are simply disreputable, because not the slightest attempt is ever made to run them upon methodical business principles. You have all seen them, and, perhaps, passed on with a very tired feeling, and an inward resolution to sell out and get into some other line!

It certainly seems strange that people will be content to live from hand to mouth, obtaining credit where they can, and never paying bills until they must, with nothing to live for in the present, and nothing to hope for in the future. A passer-by is counted upon in the forenoon to supply the wherewith for dinner, while another one must of necessity show up in the afternoon in order that supper and scanty breakfast may be assured. There are hundreds of just such people in our land who are bringing into disrepute a noble profession. If they only worked, or displayed any inclination to do so, a helping hand might be extended to them—but they don't! Heaven only knows, I have a heart full of pity for a poor man, and have wished myself a millionaire more than once—in which case, perhaps, I might have spent nothing! Be that as it may, however, a poor man without capital or credit has no more right to embark in a business venture and destroy confidence in a business that others of integrity have entered in than has one person the right to demand another to support him, when he renders no just equivalent therefor. It is only within very recent years that the mercantile agencies have rated photographers, and the stockdealer will find to his cost that his business will

prove a hazardous one if he relies upon these reports, even at this day. No man has an excuse for contracting bills, unless the means to pay them with is in sight, any more than he has the right to conduct a business except upon a practical financial basis.

I am satisfied that there exists a strange misconception of ideas on this point of management in our business. Too many of us are prone to believe that they commence at the root when they reduce wages. Rather increase them, not only because the labourer is worthy his hire, but because you cannot get good men without paying for them. A photographer conducting, as he does, a business of limited extent, must, perforce, combine several functions in one, but he need only look to the large drygoods establishments which are to be found everywhere, and which are usually good-paying mercantile ventures, as evidenced by the amount of capital invested in them. It needs no shrewd observer of these places to note the absolute fact that the profit does not come in the selling, but in the buying, of the goods. The buyer in every house is the highest-salaried man in each case, and no amount of money is too large for the services of the one who is most competent. Here is a first lesson in which we all should dwell. If your footsteps led you from place to place as mine do, you could not but wonder what strange hallucination on the part of the photographer, or mesmeric influence on the side of the salesman, could ever have induced the purchase of such trash as everywhere abounds, ranging from a useless toy or penny whistle—they cost seventy-five cents when you are a photographer—down to hand-painted coal hods, or something similar. I know of one party who is a good buyer—not in the sense *I* mean, though—and he never takes in a few dollars than he sallies forth at once to see what he can invest in that will add to the attractiveness—to him!—of his gallery. As a consequence, the place is so littered up with stray pieces of furniture, ancient, mediæval, Louis-Quatorze, or Grand Rapids, vases square, round, hexagonal, and of every other geometric form, together with rainbow-hued rugs, draperies, &c., that the eye is fairly bewildered, and never recovers itself until the operating room has been left far behind. Verily, simplicity is a jewel!

It should need no practical man to know that, in the matter of the stock required for our business, the cheapest is not the best, and never will be. A man may not be able to afford broadcloth, and yet find good service in medium-priced woollen goods; but he never yet bought a five-dollar suit of clothes that he did not throw his money away. I know a certain party—and he does not stand alone—who bit like a hungry fish at a fresh worm, when some one came along and offered him a job lot of 10,000 card mounts at an unprecedented low figure. They arrived in due season, and after five or ten gross of prints had yellowed, and he discovered the mounts were full of hypo, it was too late to return them, and I'll wager they stand up in a corner yet, untouched and uncared for. As he had purchased them from an irresponsible party, outside of the regular business, he had no redress. Now, as a man can be practical in his buying, he can also be practical in the care which he takes with what he has bought, avoiding waste, using chemicals judiciously and not extravagantly; keeping card mounts in boxes, so that dust will not soil a single one of them. As I remarked at a late Convention, "More money can be wasted in a gallery than is ever made." And I think I spoke the truth. It is wonderful what can be done without verging on the extreme or running economy mad. Thus, I knew a certain New England photographer who utilises his discarded prints for sample pictures by remounting on them and then bevelling the edges. They are just as serviceable for this purpose as new ones, and, besides, cost nothing, which means make something.

In the dark room, and under the skylight, one must ever be practical. The experimenter or the theorist have no place in either. The former's proper sphere is in the laboratory, and the latter is too prone to go astray in his wild chase for the will-o'-the-wisp, that ever eludes his grasp, to come down to practical work. When a man thinks that he "knows it all," he is beyond any realisation of how little he really does know.

Education has no limit, and the white-haired man of eighty is but a little child learning the alphabet. Practical work in the gallery means systematic work, not conducted on the principles of the butterfly, who ever flies from flower to flower, and never stops long enough at any one of them to see exactly what it *is* like. One must needs be patient, willing, earnest. He who is ever doing, never does—the practical man completes his task, and then seeks fresh fields.

II.—Artistic.

It is with no little diffidence that I cross the threshold of a National Convention for the first time and approach the paramount subject of art. In the words of Mrs. Wilcox, whose beautiful poem has been rendered so merited a tribute by this Association:—

> "I step across the mystic border land,
> And look upon the wonder world of art.
> How beautiful, how beautiful its hills!
> And all its valleys, how surpassing fair!
>
> "The winding paths that lead up to the heights
> Are polished by the footsteps of the great.
> The mountain peaks stand very near to God;
> The chosen few whose feet have trod thereon
> Have talked with Him, and with the angels walked."

We are prone to call ourselves artists, and allude to our calling as a profession, which it most certainly is. At the same time we are confronted with the every-day signs of artist tailor, tonsorial artist, and a whole host of similar artistic allusions to what are generally considered trades. It may be, perhaps, vanity on the part of persons seeking to elevate themselves above the ordinary riff-raff that surround them; it, may, again, be a clever advertising scheme to delude the public into believing them above their competitors, that induces these allusionistic outbursts. But as you will, there is certainly a vast difference between the true artist who paints because he loves to, whose whole life is passed in an atmosphere of art that is far above sordid considerations, and as separate from the ordinary business world as the realms of heaven are from the far-down regions, to which bad photographers should be consigned—a vast difference, I say, between such a person and he who, in his struggle for the artistic in photography, never forgets the bread-and-butter end, which, after all, is what he is mainly after. True art has, therefore, no business department attached to it, while photography ever has, and ever will have. We can, therefore, better designate it as an artistic business—a business, all the same, but artistic in its aim and tendency. This being the case, my subject becomes a leading one.

A very famous artist, to whom I once showed some beautiful landscape pictures, said to me, "I have always looked upon photography as a mechanical process," an impression I afterwards found to be very general among that fraternity. It can truthfully be said, however, that it is not every day that we see such an artistic appreciation of the quality of good photographic work over that of the ordinary amateur as was illustrated by a friend of mine whom I will designate as John. An acquaintance of his called upon him lately, and, after a little preliminary talk, remarked, "John, I've just bought a photographic outfit." "Yes," answered John, with full anticipation of what was to follow, "I'll call around to your house Sunday, and make a picture of your dog, if you'd like me to." "Why, certainly." The acquaintance shifted around uneasily for a moment or two, and then said, "It's a fine camera." "I suppose it is." At last the crisis came, in the shape of the usual "What will you give me if I take a picture of you?" John hesitated a moment, as if in deep thought, and then replied, as though a brilliant idea had just struck him, "Why, I'll give you the picture!"

It is surprising how late in life an appreciation of the value of a photograph comes to some people. They never seem to realise, until some dear departed friend has travelled the old, old path, and left behind no trace of the features that were once so dear, how welcome would be a glance at that face as perpetuated by our art.

I met a colonel down in Kentucky the other day—a not uncommon circumstance, by the way, in that country—and we were talking on my usual favourite subject. In the course of the conversation he remarked "I've always had a sort of hesitancy about having my picture taken, and for what reason I cannot explain." Whereupon I, of course, expatiated upon the duty he owed his family, with such effect that, a day or two after, he actually visited a photographer. "I'm sorry now that I didn't go before," he remarked; "for, when the boys were in the army, they were always having their pictures taken, while I have not a single one to remind me of how I looked in those days. I remember once of having made a campaign which lasted nineteen weeks, and I wore the same shirt all the time. I tell you what, sir, I'd give anything for a picture of that shirt!"

In no less degree does the feeling of regret come to the photographer, in after-years, when he sits down some dismal afternoon and thinks of the wasted opportunities of his life. The rain drops patter down on the skylight, and each one of them marks an idle moment that has slipped through his fingers like grains of sand. For years and years he has pursued the weary morn-to-eve round of work, acted his part conscientiously—nay, earnestly. He has been content with what he had, harmed no man, sought nothing to which he was not entitled. Should he not, then, be content and happy? Ah, but there are other thoughts which an easy mind should not be troubled with, and yet which cast a sombre pall over

his life. On every side he has seen advancing, with slow but steady march, bright minds piercing the veil of obscurity—men who had toiled, perhaps, no more than he had, but whose every thought had been concentrated upon an ideal which took a step forward for every one they made to attain it. And the step forward they took was toward art!

Time and time again have I heard the old familiar cry of "If I *only* had the subject," as I showed some work of art, and as often have I replied in my own mind, "It is not subjects you want, my friend, but education!" An artist ever idealises or he would never be an artist. He seeks not to emphasise some harsh and incongruous thing which catches the eye, but rather drives them from his thoughts, turns them down, or else glosses them over so that they are not distractions. Wherever he sees the beautiful he emphasises it, catches the bright sunlight of his subject, and let the rest lie where it belongs, amid the shadows. I once received a photograph, from the far west, of a bridal couple, taken, of course, in the orthodox way. And right here, in parenthesis, permit me to remark, that I never *could* quite understand, save it be commanded by law, why almost every photograph ever taken of a bridal couple always presents the groom as being seated, perhaps to emphasise the point that he is tired, while the bride stands with her hand upon his shoulder as if to hold him down, or to prevent him from escaping. These are points in artistic photography that are unfathomable. To revert to the picture in question. It was not enough for that photographer to present the regulation pose, but he must needs permit that man in striped trousers that alone would have been sufficient to have distorted the lens, to place his hands, which looked like fins, directly over his knees. I labelled that picture, "Honest hearts and willing hands." From the same photographer came a picture of a presumably young lady, who wore, in lieu of a broach, a large pair of scissors. There should have been hung up above her head the motto, "Look out, or I'll cut you!"

The most inexplicable thing in all our profession is why so many photographers continue to present us with faces that are utterly without detail, and as white as the paper on which they are printed. Ruskin remarks, when the student asks him to paint a white cat, "Your white cat is grey!" And so it is in reality. No such thing exists in life as a white face. Even in the broad sunlight the relative values are still preserved, and flesh is ever darker than the white linen around it. The first thing impressed upon the mind of a student when he enters a school of art, and seeks to become a painter, is this very idea of "value;" and it is dwelt upon so forcibly, and with such persistency, that it produces an impression that is never effaced. Why, then, should not he who deals with even finer gradations of light and shade—for the camera catches that which the eye cannot—make a similar study? I am well aware that a fortune awaits the man who can satisfy the dream of a darkey's life, and portray him as a white man. Would it not be better, then, to turn all these efforts at colourless lighting in that direction, rather than further bad art?

Good art may be defined as that art which survives time. Geniuses are not born every day, and it is perhaps lucky that they are not, for a genius is ever an unbalanced man. All that any of us can ever expect to be, speaking broadly, is to ever remain students. The world lies before us, the past is but a stepping-stone to the future. Compare the work of to-day with that of yesterday. The immortal part of art may not be within the reach of one's footsteps, but, thanks to the reproductive processes of photography, every man in the land can gaze upon masterpieces for a song. And so I beg to emphasise this point by asking you to permit me to present a few examples of good art.

One of the best masters for the modern photographer to study is, unquestionably, that most famous student of Rubens, whom we reverence as Vandyck. Fromentin, in his book entitled *The Old Masters of Belgium and Holland*, which, by the way, is kept as a standard work of reference in your public library here, and which I cannot too strongly commend to your attention, thus speaks of him: "With his important work, his immortal portraits, his soul open to the most delicate sensations, his individual style, his personal distinction, his taste, his restraint, and his charm in everything he touched, one may ask what Vandyck would be without Rubens." And, in answer to this, we have: "There is always more sentimentality, and sometimes even more profound sentiment in the fine Vandyck than in the great Rubens." My first illustration is a portrait of Cornelius Van der Geest, which graces the National Gallery of London. It is severely simple in style, and the character lines of the face have been preserved with a fidelity that is startling. I presume an ordinary photographer would criticise the lack of detail in the mantle; and yet its folds, though more suggestive than real, are indicated, and by but a few touches of the brush. The artist understood his subject, and he sacrificed everything to throw it boldly before you, because it was a face worthy his talent to portray.

By the same master we have the *Beatrice de Cusance*, which may be found in the Royal Gallery of Windsor Castle. I have selected this illustration because the picture was unquestionably made under the same conditions of light as are the photographs of to-day; and the more you study this picture the more does this fact become apparent. The poise of the head is beyond criticism, the lowering of the eyes so suggestive of the superior birth of the lady that, were the regal robes removed, the face would yet bear out the character.

I come not here before you as a critic of art; but, were I one, I should pause before so magnificent and imperishable an example of wonderful lighting as portrayed in the *Portrait of a Man*, which has a permanent home in the Royal Gallery of Dresden, and is also by Vandyck. These three examples have been studied for centuries; why cannot we, then, join hands with the artists and lovers of art in paying them a similar attention?

I have always been struck with the somewhat singular fact that the photographer who seeks to take a group always fixes upon one particular spot, upon which all eyes must be concentrated. As a consequence, we have seen hundreds of pictures of wooden figures that were better placed before some cigar store than a camera. It is for this reason that I have selected a picture of Franz Hals', entitled *Reunion of the Corps of Archers of St. George*, which may be found in the Municipal Museum of Harlem. From the same brush we have a piece of *genre* work, the strongest of its kind I ever saw, which is entitled *Le Fon*, and which has "*a permanent home* in the State Museum of Amsterdam. To quote Fromentin again: "Hals was only a workman—I warn you of that at once, but as a workman he is certainly one of the most clever and expert masters who has ever existed anywhere, even in Flanders, in spite of Rubens and Vandyck; even in Spain, in spite of Velasquez."

For years past, though not so frequently now as then, for which Heaven be praised, has this land been deluged with so-called Rembrandts. Through what strange misconception of ideas or woeful and inexcusable ignorance, these attempts have been foisted upon an indulgent public, I never could quite understand. Permit me, then to, introduce Rembrandt in one of the strongest portraits of himself that he ever painted. The pose is matchless, and the easy grace with which the arm is leaning on the balustrade is beyond—far beyond—any criticism any of us here can make. The face, calm and sedate, the eyes looking at you in a gentle, thoughtful way, the hat thrown thrown negligently on the head, as though no thought of the master mind beneath was ever bestowed upon so commonplace an object. We pause; we cannot criticise it. It has been said of Rembrandt that "he decomposed and reduced everything—colour as well as light—so that, while eliminating from appearances everything that is manifold, condensing what is scattered, he succeeded in drawing without outline, in painting a portrait almost without apparent features, in colouring without colour, in concentrating the light of the solar system into a ray." And who can say more?

And so we pass along into modern art where Bouverie charms us with his wonderful half-tones. The carbon brown needs but very little imagination to transform itself into the bright hues of summer time. We see real sunlight, real leaves, and an ideal Madonna as depicted by modern ideas, and beyond all this we have real "values" as I have seen nowhere else, and so we come back to our starting-place, and quote again from the authoress of *Maurine*:—

> "Awed and afraid, I cross the border land.
> Oh, who am I, that I dare enter here,
> Where the great artists of the world have trod—
> The genius-crowned aristocrats of earth?
> Only the singer of a little song;
> Yet, loving art with such a mighty love,
> I hold it greater to have won a place
> Just on the fair land's edge, to make my grave,
> Than in the outer world of greed and gain
> To sit upon a royal throne and reign."

Pardon me if I have trespassed too long upon your time; excuse me if I have thrust upon you thoughts which probably have been rendered far better before, but believe me when I congratulate you all upon this Convention, where art takes on such a new impetus, and ideas display themselves on every side. Photography is making giant strides in its irresistible march onward, and it is ever striving for new ideals.

This Convention marks an epoch in each of our lives. The attention you have given me establishes the fact that photographers come here for educational purposes, and not with the idea of attending a circus—they can see the latter for fifty cents in their own towns. Let us, then, join

hands, and make our gatherings so interesting that none can afford to miss them. We have dozens of men in the ranks who can come forward to educate us, and there are hundreds who can *comprehend* them when they *do* talk. We must step to the foreground and *not* towards the background—that is past. Let us, then, look for that time when no sordid business considerations shall conflict with the high aim of our association, when manufacturers, dealers forget for the moment their callings and join hands with the photographer to elevate an art we all love so well.

WILLIAM F. MILLER.

THE ONE THING.

[Photographers' Association of Ohio.]

You have my apology for committing to paper what I have to say, in this That I wish to be understood and fear I might not were I to try to talk without.

If in this short paper I shall interest and instruct, by bringing before you clearly the main idea, I shall feel that I have written to some purpose. I promise I shall not be tedious. In casting about for a subject, I asked myself what will be most practical, most useful? Is there one thing to be desired more than another? Is there anything paramount?

Christ, the great teacher, said: "There is one thing needful, and Mary hath chosen the better part." The world, especially the thinking world, is fast coming to know that the only life of worth is the altruistic one; the true form of life, that only which is real and enduring, which is far above the material or animal life, and so far transcends the physical that without it the latter would not be worth the living.

Time is proving this utterance of the Great Teacher to be a living truth, in which he would have us know "that this one needful thing" is the only real thing, and so it is with all the affairs of men. Take out of them the "one thing," the essential feature, and they at once become so much useless material. I ask, then, Have we chosen the better part? Do we put into our work the essential feature—that which shall endure? If not, it surely will fall short of the mark.

What, then, may I ask, is this essential feature—the one thing needful? In the midst of our struggle with the conglomerate of plates and pyro, paper and silver, carbon and gelatine, cameras, lenses, and backgrounds, rests and accessories and what not, there comes to us a sort of bewilderment from which at times we look up and ask What is it? What are we striving for? Do we know? It cannot be money, for he who makes that his aim only gets it. No, not that, our inner natures strive for something better, something higher. The course laid down for us by our Maker is ever an upward one, and, if we go not that way, unrest and discontent is ours.

This aspiration, which always looks up, and will never be satisfied by mere material, is heaven-born, and is to be found in the hearts of all men who will never be content until the goal is reached. Year after year we come to our conventions but to go away again deeply feeling our poverty and want, feeling unsatisfied and that there is but little we have learned, while many of us go home again to become nothing more than mere plagiarists. We cannot of ourselves do anything only just what we have seen that others have done. In fact we have not gotten the idea. We have missed the "needful thing" and so we cannot be original. We cannot create, and creation is the expression of a thought, the giving to it a form. 'Tis the result of the domination of the mind over material. Not the production of elements, not the making of matter, but simply the use of such things to show what is in the mind. And in all the universe of God we but behold the thought of the divine mind.

Just so our Creator has given to us a mind and placed at our disposal the elements, the material, and says to us, "Create!" He also says, "Look on my work, here is your pattern!"

With material in abundance and patterns of such endless variety, what then, do we lack? What do we need? Thought! Thought!! Thought and observation! Not so much of what each other is doing, only in so far as it may aid us in thinking for ourselves, but observation of the countless and varied beauties the Creator has spread out before us.

To my mind no one aside from the artist with brush and palette, or the sculptor with clay and tools, can come nearer to a creator than can the photographer—if he will. But what is to be the order of his creation? What can they be but the production of his own thought?

You show me a man's productions and I will show you his mind. Now, in order to get that which is best in photographic attainments, there must be that which is purest and most noble in mind and thought. He who lives only in the material world will produce a very low order of photography. He whose life panders to lust and passion will make pictures of that order. He cannot in his productions rise above his own thoughts. If they trail in the mud, dirt will glare from his work, and, so long as we grovel and hunt among the lower things, so long as we try to satisfy with the material, so long shall we be disappointed.

No, no, brother, the things you are looking for are not down there, they are up there; in the realm of thought only are they to be found.

We talk a great deal about "Art," "Art in Photography," and are wont to style ourselves "artists." Art in photography means thought in photography. "Art," like "a creation," is but the expression of a thought, and works of art, after all, are but the "creations" of men. How much, then, has material to do with it?

Do you ever stop to think that the poorest and most miserable photograph contains just as good material as the most beautiful and ennobling one has?

What makes the difference? The mind of its creator.

Last year our President asked me to tell how I made my work. "Tell us something about carbons," said he, and this year comes the same call again. Why, bless you, friends, carbons are not pictures. Do you know what dirty, miserable black stuff carbon is? Last year I tried as best I could in a few words to tell something about picture-making; but I must have sadly missed the mark, for shortly afterward I saw a garbled account of what I said twisted out of all semblance and made to answer the purpose of an "ad" of "something that was said to be equal to a carbon." Ridiculous! Pictures are not material. "Paste it in your hat." They are not material. They come from a higher source. Any one who has had the pleasure of visiting our Soldiers' Home at Dayton will bear me out in the statement that it is one of the most beautiful spots on earth. Often as one may visit there, they never tire of the place. At every turn new beauties spread themselves out before you. At each new point new surprises await you. Now, what makes it so? The trees are just like others; the grass no greener; the flowers no brighter; the lakes no purer, nor the heavens more blue. Nor is the architecture so grand as others. What makes it? Mind! Thought! The whole thing is a scheme in which every lawn, tree, flower, shrub, building, lake and fountain fall into place as though by chance, and yet it is all the thought and plan of a masterful mind.

What is the one thing needful? Thought; and the higher the thought the better the work. Show me a picture that tells of study—careful intelligent study—one in which the lights and shadows sustain their proper relation to each other, and where pose is suggestive of refinement and grace—that which appeals to all that is good and pure in me, and I care not whether it be made of carbon, sulphate of baryta or brickdust, it will always remain a source of pleasure.

What we need, brothers, is a higher conception of beauty and the eternal rules and principles governing better and cleaner lives, living that does not cloud or muddy the brain; then a closer application to the study of art principles and rules, an education and training of the mind, eye and heart, so that we can see, so that we shall be able to recognise it when we have gotten it, and cameras and photo materials will willingly become our servants and do our bidding.

Take a glance with me back over the past into the palmy days of collodion and albumen, and, from the material point of view, was there much more to be desired? With all the changes, has there been much advance made?—technically, I mean. I fear not. What, then, is the trouble?

I will tell you. We have been kneading and kneading with our hands, and have not used our brains. We lean on the very sensitive dry plate, and expect it to do our thinking. We depend upon the ever-ready sensitive paper, expecting it to respond to a material call. No, no, brothers, this won't do. We must think, think, think. Then, let us come up next year prepared to show some of the results of our thinking. The materials are all right. We go lame only in our minds. See, then, that we find out!

Study out "the one thing needful," and "choose that better part!"

J. M. APPLETON.

THE OUTSIDE SPECIMEN DISPLAY AS A BUSINESS PERSUADER.

EXCEPTING less than half-a-dozen instances in New York and London, the world's photographers are agreed that the display of specimen pictures at the doors of their establishments is a matter of business necessity. Consequently the photographer's first thought, when once he has settled upon his location, is to get out an attractive display of specimens to draw the attention of the public to his gallery. At this time the photographer regards the matter from a practical and rational standpoint. He is not only sure that a display is necessary, but he also realises that the better and more attractive his display so much the more business may be expected to result from it.

Too often, however, when once a business is known and established, this important detail of display is neglected. This is especially true with reference to galleries in the smaller towns. In many cases, I might almost say in the majority of country galleries, the outside display would seem to be regarded as a necessary evil. It is always there—in evidence—but so often allowed to grow stale and unprofitable that its usefulness as a persuader of business is wholly lost. This should not be; the photographer should never forget that his outside display of work is one of his most valuable advertisements, seen, as it is, by a large proportion of those from whom he hopes to secure business. A poor display is as effective against the photographer's interests as a good display is in his favour. Good work always attracts; bad work, or a neglected display of fading photographs, repels. By proper attention to this detail the average photographer can keep the public eye always focussed upon his gallery, from which, it is needless to say, considerable business will result in due season. This can be done by arranging, first, that the display be as large as space will permit; second, by making it attractive at every point, either in arrangement or novelty of subjects; and, third, by keeping the subjects constantly changed.

To secure as large a display as is possible, it will be necessary to use a show-window wherever this is available. Supposing that a window can be had which gives a space of 10 by 12 feet for display purposes, the placing of large plate glass mirrors at either end, perfectly at right angles to the display ground, will apparently extend the display to almost three times its real proportion. It is true that this device only duplicates the display, but it serves to attract attention, and for this reason alone is well worth its cost. Where only an entrance hall with the usual staircase leading to the gallery is available, the sides of the hall and stairway should be lined with permanent show-cases having hinged doors, so that the inside display may be arranged or changed in sections at will. When such a display is arranged in loose frames of large size, the inconvenience of removing the frames bodily and changing their contents serves as an excuse for their neglect.

By renting attractive spaces in the public halls, railroad waiting-rooms, news and art stores of his town the photographer may extend his display facilities with great advantage often at a very slight cost. I am well aware that the providing of an attractive display of specimens is a matter of considerable difficulty to the photographer in the smaller cities. This difficulty arises not only from the scarcity of good material, but quite as often because the photographer feels that his work is not sufficiently attractive or persuasive to justify extensive display. These two stumbling-blocks may be removed by the exercise of a little right thinking and enterprise. Every locality has some material for good specimen work, and, if it does not come to the photographer in the way of legitimate business, the advertisement value of his display is sufficient justification for seeking his subjects out and persuading them to be photographed for this purpose, payment being provided for in copies of the pictures secured. Or the scarcity of material may be provided for in another way. It is essential, chiefly, that the attention of the public be secured. This can be done by making a display of pictures of any sort, gathered from various sources. The facilities of the particular gallery so advertised can be made known by sandwiching in with such a display a few good specimens showing the work of the photographer making the display. To illustrate this idea, let the photographer make a display at one time of specimen platinotype prints, with a brief account of the advantages of this method of portraiture. These specimens may be obtained commercially, and may be either actual photographs or copies of paintings, &c. The insertion here and there of work made at the home gallery will serve the purpose of directing attention to the gallery itself. As a matter of honour, no photographer will attempt to deceive the public into the belief that all the work, shown as I have suggested, is his own. There is no need for deception; the end desired is to attract attention to the desirability of being photographed, and, as a final end, to the facilities of the photographer who provides the display; and if a photographer in Portland, Or., can secure for his show-frames a display of work by leading Eastern photographers, he need not fear to give credit to the artists whose work he uses, inasmuch as its display can neither hurt them at such a distance nor injure his own interest.

Another interesting display could be made of specimens of natural-colour photography, photogravures, and collotypes, all of which are readily obtainable, or a display of bromide prints, small enlargements in finished and unfinished stages, and in various tones, could be made to serve the desired purpose of advertising the usefulness of the photographer's art. Similarly, displays of portraits in oils or pastel or water-colour pieces could be utilised. The great thing should be to secure and keep the public interest; this attained, the photographer can easily draw attention to his own work and equipment for this or that speciality.

There are one or two points about the arrangement of outside displays which are worthy of mention. During the summer months, when the sun is high and the streets unbearably heated, the photographer should see that his display is abundantly shaded and protected by awnings. This will not only keep the display from damage and fading, but will also provide a shady nook for passers-by, who will naturally accept its relief, and incidentally give attention to the display made for their instruction and pleasure. If the photographer's entrance allows sufficient space for a substantial rustic chair for the accommodation of ladies, so much the better for his business.

Of course, all this presupposes that the display frames are well ventilated, so that the subjects may be examined with pleasure in wet or dry weather, and that the entrance to the gallery is kept clean and well furnished so as to offer an attractive prospect. This is another detail which is too often left neglected.

Regarding the changing of the subjects which make up the specimen display, there is only one thing to be said. The outside display should be changed at least once a month, or, where subjects are available, once every week. The public should never be permitted to see in a photographer's display anything which will encourage the opinion that the beauties of photography are evanescent. This necessarily entails an amount of work, but it is of the utmost importance and well deserves the strictest attention.

Finally, there is a method of displaying specimens for the attraction of the general public which has not yet been given sufficient application. I mean the display of photographs at night. This may be accomplished by providing suitable electric or gas-lighting arrangements where the display is placed in a show-window. Such a display stands out in bold relief when near-by business places are closed, requires attention only to turn on and off the illumination at the proper time, and in a location properly adapted for it is a very effective persuader of business. In some instances the projection of good portrait work, interpersed with views of subjects of general or humorous interest, by means of the optical lantern, will, where such an arrangement is available, prove a good method of attracting public attention to the business of the photographer. *Verbum sap.*

JOHN A. TENNANT, in *Wilson's Magazine.*

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

THE following is the balance-sheet for 1895:—

Dr.	£	s.	d.
To hire of room for Council meetings (4)	1	2	0
,, Balance Birmingham account	18	15	1
,, Badges	1	0	3
,, Laing's account	1	15	3
,, Printing expenses	15	11	7
,, Postage, petty cash, &c.	6	3	11
,, Balance	77	9	0
	£121	17	1

Cr.	£	s.	d.
By Balance, 1894 account	42	0	0
,, Balance, Exhibition account	4	18	6
,, Advertisments	25	8	7
,, Subscriptions	49	10	0
	£121	17	1

	£	s.	d.
By balance	77	9	0
Invested in Post Office Savings Bank in names of S. B. Webber and R. P. Drage as Trustees	50	0	0
Total Convention funds	£127	9	0

R. P. DRAGE, *Hon. Secretary.*
Audited and found correct, JOHN HOWSON, THOS. FALL.

ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION.

THE following are the awards in the Photographic Section:—

Professional Photography.—First silver medal, J. Chaffin & Son and W. J. Bryne; second silver medal, J. C. Burrow and J. Lafayette; first bronze medal, J. H. Coath, W. Norris, P. Lancaster, F. Marsh, H. V. Brightman, H. J. Godbold, and Autotype Company; hon. men., J. H. Gear and H. Coath.

Amateur Photography.—Second silver medal, W. S. Aston; first

bronze medal, Rev. H. B. Hare, Rev. C. B. Keene, Court Cole, and H. K. Barnett; second bronze medal, S. L. Coulthurst; hon. men., G. Hepworth.

Photographic Appliance Section.—First silver medal, G. Davenport; hon. men., G. Davenport.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY. — Technical Meeting, Tuesday, October 1, at the Gallery, 5A, Pall Mall, East, at 8 p.m.—The apparatus on view in the Exhibition will be described by the exhibitors.

MR. W. MARTIN, of the Putney Photographic Society, writes: "Kindly note that we have now arranged to definitely hold our meetings at the School of Art, Putney, on the first and third Thurdays during the months from October to end of April."

"JUDY" begins a new life with this week's issue, in the hands of Miss Gillian Debenham, who has just purchased the paper from Mr. Gilbert Dalziel. The editorial chair will be occupied by Mr. C. H. Abbott, who has acted as sub-editor for many years past.

LAST week's report of the Photographic Club mentions the selection of Judges for "Mr. Watkins's Competition." This is a developing competition, not designed to advertise any commercial wares, but to throw light upon disputed points in control of development. Ten guineas in prizes will be given. Conditions and particulars are submitted to the Photographic Club for approval, and will be issued shortly.

DEATH OF MR. JOSEPH DUNCAN, OF YORK.—Last Saturday was laid to rest in York cemetery the remains of Mr. Joseph Duncan, of the firm of Duncan & Lewin, photographic artists, Minster Gates, York. The deceased gentleman was seventy five years of age, and a native of Kingston, Scotland. Some forty-five years ago he went to reside in York, and from that time carried on one of the most successful businesses in York. For many years Mr. Duncan has made a rare collection of Norman and Saxon church views, views that are exquisite works of art. His familiar figure will be missed, not only by the citizens, but by visitors who come to the minster city.

NOTICE OF REMOVAL.—Mr. C. C. Vevers writes: "Having secured more commodious and central premises at 140 and 141, Briggate, Leeds (the principal thoroughfare in this city), my address in future will be as above. My new premises, which are situated between the Albion and Bull and Mouth Hotels, consist of upwards of twenty rooms, including large sale shop, offices, show rooms, stock rooms, electric, enlarging and printing rooms, dark rooms (one of which is reserved for customers' use), have been entirely refitted and lighted throughout by electricity, and now form the largest photographic depot in the provinces. My old premises at 12, Market-street will be retained for wholesale and manufacturing departments, and several important extensions will shortly be made in this branch, to meet the increasing demand for our well-known specialities."

THE Eastman Photographic Materials Company, having purchased the business of the Boston Camera Manufacturing Company, are issuing the following circular:—"Boston, Mass., U.S.A., August 23, 1895. To the photographic trade. "Gentlemen: We have this day sold to the Eastman Kodak Company, of Rochester, New York, the entire business of the Boston Camera Manufacturing Company, including all goods, machinery, patents, trade marks, trade names, and the goodwill of said company, and we shall retire from the manufacture of photographic goods. All accounts made after this date are payable to the Eastman Kodak Company, Rochester, New York. Thanking you for the patronage we have enjoyed, and soliciting for our successors a continuance of your trade, we remain, yours truly, BOSTON CAMERA MANUFACTURING COMPANY."——"London, September 25, 1895. To the photographic trade. Gentlemen: As announced above, the Eastman Kodak Company have purchased the business of the Boston Camera Manufacturing Company, and will continue the manufacture of the full line of bull's-eye cameras. We shall soon have a fresh stock of these cameras to offer, and at the present moment are prepared to supply firm for them. Soliciting a continuance of your orders, we remain, yours respectfully, THE EASTMAN PHOTOGRAPHIC MATERIALS COMPANY, LIMITED, 115-117, Oxford-street, London, W.; 4, Place Vendôme, Paris; Eastman Kodak Company, Rochester, New York, U.S.A."

THE Stanley Photographic Competitions, in connexion with the Nineteenth Annual Exhibition of Cycles, their accessories, machinery and tools, photographic apparatus and pictures, held by the Stanley Cycling Club, will be held at the Royal Agricultural Hall, Islington, London, N., from November 22 to November 30 inclusive. Medals and prizes are offered for competition in the following classes:—A. Landscape (with or without figures) and Seacape, gold, silver, and bronze medals. B. Hand-camera Work (from negative not exceeding five by four inches), gold, silver and bronze. C. Figure Studies, *Genre*, &c., gold, silver, and bronze. D. Portraiture, silver and bronze. E. Beginners (who have commenced photography since January 1, 1892), silver and bronze. F. Cycling (for the best print taken by apparatus carried on a cycle), gold, silver, and bronze. G. General Class (pictures not included in any of the foregoing classes, such as architecture, scientific, &c.), silver and bronze. H. Special Class (for amateurs who have not previously gained a medal or prize at an open photographic exhibition), set of three prints, any subjects. First prize, a hand camera, value 5*l.* 5*s.*; second, silver medal; third, bronze medal. Note.—Previously medalled pictures are entitled to compete in all the classes except H. The Judges are Mr. Bernard Alfieri, Mr. A. Horsley Hinton, and the Rev. F. C. Lambert, Esq., M.A. The address for all communications is Walter D. Welford, Manager Photographic Section Stanley Show, 57 and 58, Chancery-lane, London, W.C.

PRODUCTION OF GOLD, PLATINUM, AND SILVER IN RUSSIA.—In the year 1893—the latest year for which returns are available—the production of gold in Russia amounted to 2736 pouds (poud=36 lbs. avoirdupois), an excess of 104 pouds over the production of the preceding year. This output was derived from the following mining districts:—The Ural contributed 738 pouds; Tomsk, 473; Irkutsk, 1392; the mines of the Emperor's Cabinet in Nerchinsk, 121; Altais, 12: and the Grand Duchy of Finland, less than one poud. The United States Consul at St. Petersburg says that, in the whole Ural region, in 1893, there were 2253 gold mines in private possession, of which only 807 were working; 13 mines, belonging to the Government, were leased to private persons. The laboratories of Ekateringburg, Tomsk, and Irkutsk, in 1893, received 2712 pouds of schlichtgold, out of which were obtained 2639 pouds of ligaturgold, in 5754 bars, which contained 2304 pouds of chemically pure gold and 221 pouds of silver. The St. Petersburg mint received 2652 pouds of ligaturgold, for which the holders obtained 30,625 gold roubles. Formerly, platinum was produced exclusively in the Ural district. In 1893, 311 pouds of platinum were obtained in all, which was 32 pouds more than in 1892. The price of platinum fluctuated between 7000 and 8000 roubles per poud. The platinum is generally purified in foreign factories, therefore Russia only exports it raw. Only two factories for the cleaning of platinum exist in the whole of Russia, the Tomtelev factory and the laboratory of Kolbe, both situated at St. Petersburg. Silver in Russia is chiefly produced in the Altai and Nerchinsk districts, which mainly belong to the Imperial Cabinet. It is also produced in the Caucasus, the Kirghiz steppes, and in the south of Russia. On the average, the mines of the Imperial Cabinet produce 275 pouds annually. It is not anticipated that an increase in the production of silver will take place in the near future. The total production of silver in Russia, in 1893, not taking Finland into consideration, where only 54 pouds were extracted, amounted to 729 pouds, including the 221 pouds derived from the schlichtgold, which was 13 per cent. less than in 1892. In 1893, 94,000 workmen were employed in gold mines, of whom 48,000 were in the Ural Mountains, where the workmen earned from 15 to 30 roubles per month, the women from 10 to 15 roubles, and the children from 10 to 18 roubles. During the year, 64 accidents occurred in the Ural gold mines, of which 18 were fatal; in the Siberian gold mines, 264 accidents occurred, of which 17 were fatal. It is expected that, as soon as the Siberian railway is completed, the gold mines in that region will resume work with renewed activity.—*Journal of the Society of Arts.*

EDINBURGH PHOTOGRAPHIC CHEMISTS AND THE POISONS ACT.—At the Edinburgh Sheriff Court last week Mr. John M. Turnbull pleaded not guilty to having, on May 27, in his premises at 6, Rose-street, Edinburgh, he not being a duly registered chemist, kept open a shop for the retailing, dispersing, and compounding of poisons, and retailed among others to a man named Spence a poison, namely, a quantity of perchloride of mercury, being a preparation of corrosive sublimate. He was also charged that he had used the word "chemist" unlawfully. Mr. Hill said he knew the shop in question. It was an ordinary shop for the retail selling, and for dealing in photographic materials. In the front of the shop appeared the words "Chemist, J. M. Turnbull." The word "photographic" was in the sign, but it was round the corner in a lane. He did not know how many persons the quantity of poison supplied to Spence would kill, but he thought it would decimate half the town, it was so deadly. Robert Spence, chemist and druggist, said he went into accused's shop for kodak plates, and also for some corrosive sublimate at 3*d.* per ounce. He had never been in the shop before, and he was asked no questions. In reply to the Sheriff, witness said it was the case that the word "photographic" would have no sense without the subsequent word "chemist." He was served by two young ladies, whom he took to be the Misses Turnbull. The accused, who was examined in his own behalf, said he had been in the photographic trade all his life. He or his daughters sold poisons only to those persons whom they knew, and he had refused to supply poisonous chemicals, although they were for photographic purposes, hundreds of times. They only supplied these poisons in wholesale quantities, and an ounce was a wholeaale quantity. It would not have been supplied to Spence if it had not been known that he was a chemist. He sold other photographic chemicals in the same way. When his catalogue was printed two years ago, a saving clause was put in to the effect that chemicals coming under the Pharmacy Act would only be sold in wholesale quantities. After hearing counsel, the Sheriff continued the case for a week.—Mr. William Hume, 1, Lothian-street, Edinburgh, was also charged with keeping open shop for retailing, dispensing, and compounding poisons, and in selling, on June 13, to Thomas Allan, a quantity of cyanide of potassium, and he was also charged with using the word "chemist" on his catalogues, he not being a duly registered chemist. Mr. Hill said he knew Mr Hume to be an eminent chemist. He was warned in 1890 by the witness, and he agreed to discontinue the practice complained of. Later, accused called on witness and said he felt himself at liberty to sell these poisons in retail quantities. In reply to Mr. Hume, witness said that a chemist was a person registered under the Pharmacy Act. Mr. Hume said that the science of chemistry was a much wider science than the science of pharmacy, and he had brought his certificates with him. He admitted that he was not a pharmaceutical chemist. Thomas Smith, assistant to the accused, said he asked Allan's name and address, and what he wanted the cyanide of potassium for. Allan said it was to clean silver. Mr. Hume read some correspondence he had had with the Pharmaceutical Society, in which he stated that he always declined to make up prescriptions, however simple. "Sugar of lead for a sair leg" was always declined. This case was also continued for a week. The Court then rose.

RECENT PATENT.

APPLICATION FOR PATENT.

No. 17,448.—"Improvements in Photographic Change-boxes and the like." W. R. BAKER.—*Dated September*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

September.	Name of Society.	Subject.
30	Birmingham Photo. Society	Last day for sending in Competition Pictures for August Excursions.
30	Camera Club	*Notes on Life in Africa.* Dr. Cross.
30	North Middlesex	Informal Meeting.
30	Richmond	
October.		
1	Bolton Photo. Society	
1	Brixton and Clapham	
1	Exeter	
1	Hackney	
1	Herefordshire	
1	Keighley and District	
1	Lewes	
1	North London	
1	Oxford Camera Club	
1	Paisley	
1	Rotherham	
1	Royal Photographic Society	The Apparatus on view in the Exhibition will be described by the exhibitors.
1	Sheffield Photo. Society	
1	York	
2	Croydon Camera Club	*Photography and our Club.* The President.
2	Edinburgh Photo. Society	
2	Leytonstone	
2	Photographic Club	
2	Southport	
2	Southsea	
3	Bradford	Demonstration on Platinotype Paper. Rev. J. Beanland.
3	Camera Club	*The Panorama.* Colonel R. Stewart.
3	Dundee and East of Scotland	
3	Glossop Dale	
3	Hull	
3	Leeds Camera Club	Annual Dinner.
3	Leeds Photo. Society	*More Chemicals Used in Photography.* B. A. Burrell.
3	Liverpool Amateur	*Life on Tea Plantations in Ceylon.* H. Holt.
3	London and Provincial	
3	Oldham	
3	Tunbridge Wells	
4	Cardiff	
4	Croydon Microscopical	
4	Holborn	
4	Leamington	
4	Maidstone	
4	North Kent	
5	Hull	
5	South London	Exc.: Old Town, Clapham. Leader, F. W. Grigg.

PHOTOGRAPHIC CLUB.

SEPTEMBER 18,—Mr. E. Crofton in the chair.

Mr. WELFORD brought down three or four very dense negatives which he referred to a few weeks since, and which he would like any one to experiment upon, with a view to making them render a better print than he could obtain.

Mr. MACKIE and Mr. CHILD BAYLEY said that reducing would not help matters.

In the opinion of Mr. TROUP and others, the negatives would print better if the stain was removed.

Mr. WELFORD repeated what he had said before, that it was possible to develop with pyro-soda to such an extent as to preclude the possibility of doing anything with the negative afterwards.

Mr. FOXLEE said that the negatives could be reduced—the stain eliminated—but certainly they would not be improved.

Mr. WELFORD said that he wanted a softer printing negative. He agreed with Mr. Foxlee that copying the negatives in question would be the easiest way of getting over the difficulty, but that was not his point. He could reduce an over-developed pyro-ammonia or hydroquinone negative, but those developed with pyro and washing soda would not yield to any treatment he had given them.

Hackney Photographic Society.—September 17, Mr. J. Gardner presiding.—Mr. W. L. BARKER gave a report of the preceding Saturday's excursion to Cookham. The main portion of the evening was given to the reading of a paper by Mr. W. Rawlings on *Photography and Painting.* A very brief outline is as follows: The writer thought that between photography and anything which was worthy of being ranked with the highest forms of art there was very little connexion. The delineation of the human passions and the higher human relations were beyond the sphere of the photographer; but there was much of pictorial art which was not of the idealistic and imaginative kind—happy effects of light and shade, of moving mists and sunset glows—all of which were natural phenomena, which did not require the highest flights of imagination to perceive; these might be well attempted by the photographer. After comparing the disabilities of the photographer as compared with the painter in being unable to reproduce colours, Mr. Rawlings said that the photographer's work compared unfavourably also with sketching in monochrome in the narrow limits of tone value. The most brilliant sunshine could receive very forcible illustration by the monochrome artist, whilst night and the darkest gloom presented no very serious difficulty. His whitest paper was whiter than any photographic paper after being printed under any reasonable negative, whilst his deepest black was black indeed. Photography, on the other hand, was limited to the middle range of tones, but within this range it was capable of producing lovely work, as fully imbued with artistic feeling as that of the skilled draughtsman. The great contrasts, unless for a special and avowed purpose, were usually avoided by our picture-makers, so that photography might not be so lacking in artistic possibility as might appear. In one very important particular photography was far ahead of painting and drawing, even in the work of the most skilled painters, and that was in depicting the form of natural objects. Painters and draughtsmen delighted in their power of altering and improving *imperfect* forms, but how often did they fail in correctly representing *perfect* and exquisite form? Where was the artist who could paint a mountain side with the ability to suggest the one-hundredth part of its beautiful lines, curves, and forms, or who was able to portray the requisite detail of a breaking wave? A general impression of the beauty might be given, but it would be but an aid to our own power of representation by which we could fill the mind with a more or less clear picture of the reality. In conclusion, if photography were not an art *per se*, it could be made such, It was a mechanical process—so was painting—without the art. The art of painting had been defined as "an intellectual and emotional interpretation of nature by means of carefully balanced and cunningly subdivided *hues.*" The art of photography might be defined, in almost the same terms, as "an intellectual and emotional interpretation of nature by means of carefully balanced and subdivided *tones.*"

Leytonstone Camera Club.—Saturday, September 14.—Dr. W. Pickett Turner conducted the last outing of the season through the Valley of the Roding, after which the members assembled at the Fir Trees; tea having been done justice to, a very enjoyable evening was spent; Messrs. Greenwood, Miles, Bailey, Cox, Harrison, Fox, and Harwood favoured the company with songs, &c., Mr. Walter Foster presiding at the piano.

WEDNESDAY, September 18.—There was a good attendance at the Monthly Judging Night for the pictures taken during the August outings.

Bradford Photographic Society.—The opening meeting of the winter session was held at the Club Rooms, Sunbridge-road, on September 19, when the President (Mr. Alex. Keighley) occupied the chair, and gave his inaugural address before a large number of members and honorary members. The President complimented the Society on the rapid strides it had made during its eight months' existence. At the first meeting called to form the Society there were present thirty-two, who banded themselves together, formed a committee, and called themselves the Bradford Photographic Society, and the number has gone on swelling, until now we have on our members' roll book some 150 members, amongst which are several lady members. The two most important incidents in the Society's short existence are, first, the affiliation with the Leeds Camera Club, whereby members of one Club are practically members of the other; the second is the honorary affiliation with the Lakeside Camera Club, whereby members of the Society, when visiting the Lakes for a short time, by producing their card of membership, will be admitted to the meetings of the Club, also to the use of the Club rooms, its dark room, and library. Two occurrences, which scarcely, if ever, happened to any society in such a short time, and where such a low subscription was charged—members were hospitably entertained the week before at the meeting of the Leeds Camera Club by the officials of that Club, and in return many of the members of the Leeds Camera Club paid us a return visit and were welcomed by our Secretary and the members of the Society, and exchanges of good wishes were passed. The syllabus of the first portion of the winter session was presented to the members, the list of subjects evidently giving great satisfaction. Mr. W. MORTON JACKSON, representing the Brin's Oxygen Company, gave a very interesting lecture on *Compressed Gases.* The lecturer dealt fully with the subject in such a clear manner that even the merest tyro could not go away without being much richer in knowledge concerning gases. The lecturer referred to the sad accident which occurred in this town during November, 1893, also the Fenchurch-street affair, and said that in consequence people had become exceedingly nervous. There were really no grounds for it, as there had been but four accidents with cylinders, and this was but a small number considering the enormous extent to which they are used. Cylinders are used for military ballooning, and in this class of work are subject to much rough usage, and yet never an accident, to his knowledge, had occurred. Kitchen-boiler explosions frequently took place, and in a very short time nine such cases proved fatal, while no less than fifty-four persons were injured. Hundreds of people were killed annually in the streets, and yet, with all these fatalities, not half the fuss is made as when an accident takes place with a cylinder. Not one accident that had taken place could be attributed to excessive pressure. Another curious coincidence was that these two fatalities have taken place in a railway station, and hence the excessive restrictions of the said companies in regard to the carriage of gas. He demonstrated in a practical manner the various qualities of gas, and, by means of a gas jet and platinum, showed the possibility of a cylinder explosion with the intervention of a flame. The lecture was listened to by a good audience, who went away feeling more at peace with cylinders than they hitherto had done. Several questions were ably answered by Mr. Jackson, whom we hope to hear again at some future date. The best thanks of the meeting were tendered to the lecturer, which he briefly acknowledged.

Brechin Photographic Association.—The Brechin Photographic Association at Martinmas last acquired those premises so long occupied for photographic purposes, and used as a studio, first by Messrs. Gillam, then by Mr. Ireland, and latterly used by Mr. Milne as temporary premises. The premises have a picturesque rustic entrance from Park-road, while the building itself is fronted by a large garden. It is only a one-story building, but of considerable extent. From the main passage there branches off a room to the left, used as a reading-room, and to the right a large store-room. The reading-room is supplied with several works on photography, and is well provided with photographic magazines, papers, &c. The studio itself is, of course, the largest and most important room of the building, being some thirty feet long by seventeen feet broad. It is splendidly lighted by means of a glass roof, one-

f the sides of the room being also of glass. The studio is intended to serve everal ends, and will be used for the holding of meetings and giving exhibitions f lantern slides, &c. There is no lack of backgrounds, photographic stands, &c. djoining the studio is a commodious dark room, fitted up with cupboards, where nembers can keep their developers, toning solutions, and other necessaries of he "black art." The rooms will be heated by slow-combustion stoves, nd will, doubtless, prove exceedingly popular with the members who intend aking full advantage of their privileges. The Society was originated at a neeting convened at the instance of Mr. James D. Ross, headmaster, Union-treet School, on October 4, 1888, and was started with a membership of leven, Mr. William Shaw Adamson, Careston, being elected President; Dr. Anderson and Mr. R. A. Scott, Vice-Presidents; and Mr. James D. Ross, Secretary and Treasurer. Of the eleven members who initiated the movement, nly Dr. Anderson and Messrs. Adamson, Ross, Middleton, G. Mackie, and A. Brown are now members of the Association. From that small beginning he Association has steadily grown, scarcely a meeting passing without everal new members having to be proposed, and now the membership umbers over eighty. The Association holds monthly meetings from September to April, at which demonstrations of various photographic processes, papers, and lantern exhibitions are given. Since its second year, the Society as given public exhibitions of lantern slides, generally concluding with an xhibition of the members' own work, chiefly district and local views, which as, no doubt, done much towards the success and the popularity of the Association. The meetings during the first year were held in the Mechanics' Institute, but, a desire having been expressed that the Society should acquire a local abitation, the premises at 14, St. Mary-street were secured. The accommodation there, however, was very limited, and, with the growth of the Society, resh premises had to be obtained, with the result that the Association was successful in securing the premises above described. Members of photographic societies of other towns on showing their membership cards are gladly accorded he privilege of using the rooms, and, on payment of a nominal fee of one shilling, can have all the privileges of the premises for a month. The Association being affiliated with the Royal Photographic Society of Great Britain, members of other affiliated societies according to the Affiliation scheme are admitted at all times without charge of any kind. Much of the success, it will readily be admitted, is due to the keen interest taken in the welfare of the Association by the genial President, Mr. Wm. Shaw Adamson, of Careston, and to the late hard-working and energetic Secretary, Mr. James D. Ross, now Vice-President, by whose efforts the Association was started, and who has acted as Secretary and Treasurer from the commencement of the Society up to a year ago. The annual meeting of the Association is to be held to-morrow evening in the new rooms, and all intending members, as well as those interested, are cordially invited. As usual, at the conclusion of the business, an exhibition of lantern slides will be given.

FORTHCOMING EXHIBITIONS.

1895.	
Sept. 27, 28	*Westbourne Park Institute.
„ 30–Nov. 2	*Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
„ 30–Nov. 14 ...	*Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
Oct. 28, 29	East London Photographic Society. Hon. Exhibition Secretary, F. Uffindell, 29 Scrutton-street, Finsbury, E.C.
„ 28–Nov. 2	*Southport. G. Cross, 15, Cambridge-arcade, Southport.
„ 29–Nov. 1	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.
Nov. 19–21	*Hackney. W. Fenton-Jones, 12, King Edward's-road, Hackney.
„ 28–30	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

THE COOKE LENS.

To the EDITOR.

SIR,—Thinking your remarks on the Cooke Lens rather suggestive of more to be said, I will just mention the points that strike me.

The light will not differ very materially from others of good make, because the third lens causes extra reflective surfaces; but, if it will work at *f*-6 or *f*-5 for hand-camera work, it should be preferable to an ordinary double lense, for a reason that I have not yet seen noticed, namely, that the outline, doubtless through the action of the negative lens, is always preserved. Let the conditions be ever so trying in the way of aperture and field, yet, although an out-of-focus effect must appear, you will always see an outline in the middle of the halo that surrounds each object. Thus it differs in a valuable manner from double forms. These, when they break up at the edges, or get out of focus, do so in an annular manner, thus creating a double outline caused by the overlapping of the sharp-edged discs which cover every part. How much more artistic it is to see a suggested outline in these undefined parts than the disc effect which destroys the true line.

Lamentably enough this disc business has even contributed to form a school of art. The impressionist painter is always starting and stopping with flat discs, and flat blobs of paint, and it has its own charm, I admit, but it is not the best way. It is best to preserve a well-indicated outline in all parts.—I am, yours, &c., A. DAWSON.

THICK AND THIN GLASS.

To the EDITOR.

SIR,—Is it not possible for plate-makers to obtain glass of a uniform thickness? I should think so, seeing the vast quantity there is used in the making of plates, and considering the patent appliances available in these days. I have lately been inflicted with a lot of wretchedly thin plates, so thin as to be hardly able to stand the slightest pressure of a spring, and these of an otherwise excellent brand of plate, a plate so good that it is all the more regrettable that this serious defect exists. I should like to know if I am a solitary victim to these egg-shell plates.—I am, yours, &c., PROFANITY.

September 21, 1895.

"FREE PORTRAITS."

To the EDITOR.

SIR,—My attention having been drawn to the babies' free photographs, and my name having been mentioned in the "Jottings" of your JOURNAL, I beg to give you my actual version of the affair, as I am one of the actual victims.

On the 3rd inst. my wife and I went to M. Jarchy's studio to get the free photograph of my baby; but, to my surprise, M. Jarchy refused to give me the photograph until I had paid him 2*s.* 9*d.* for a frame, which was only a common composition frame—and not, as he states, a leather case—worth not more than a shilling. I said, "But you advertise these photographs free of any charge whatever." But M. Jarchy said the photographs are taken free, but you must buy a frame; and he would not part with the photograph until I bought a frame, which, of course, I didn't. He said, if I wanted the photograph without a frame, I should have to pay 5*s.*, and not be included in the show. He also said, "How do you think it is going to pay me to take 1000 photographs for nothing?"

If, sir, you want further proof of this accusation, I am ready and willing to bring forward other witnesses. In conclusion, I may state the photographs are cabinet size on a 10 × 8 mount. Thanking you in anticipation for inserting this letter,—I am, yours, &c., W. HILL.

62, *Eugenia-road, Rotherhithe, S.E.*

To the EDITOR.

SIR,—In reference to the correspondence of Mr. Jarchy's free baby photographs, I sent my wife to have our little boy taken. Mr. Jarchy gave her a form, which was filled up and returned, and a day fixed for the photograph to be taken, but was informed by Mr. Jarchy that she would have to buy a frame, which was only 2*s.* 9*d.* I need not say that my wife refused to buy a frame that was only worth 9*d.* for so exorbitant a price as 2*s.* 9*d.*, and was told that she could not have the photograph taken. Mr. Jarchy has not the courage to put the denial to above statements in our local paper, which he sent you to see the big puff put in by our editor, but in a paper which only gets in the hands of the trade and amateur photographers like myself.

In reference to the statement that Mr. Jarchy was employed by Messrs. Heath & Co., I have every reason to believe that it was his brother, and not the one who signs himself "A. L. Jarchy" in last week's JOURNAL. Apologising for troubling you at such length,—I am, yours, &c., BONA-FIDE AMATEUR PHOTOGRAPHER.

EAST LONDON EXHIBITION—JUDGES.

To the EDITOR.

SIR,—Will you please make it known through the columns of your paper that the following gentlemen have kindly consented to act as Judges at the above, viz., Messrs. F. P. Cembrano, jun., W. L. Colls, and the Rev. F. C. Lambert. Entry forms and particulars can be obtained of F. UFFINDELL, *Hon. Ex-Secretary.*

49, *Scrutton-street, Finsbury, London, E.C.*

SOUTHPORT SOCIAL PHOTOGRAPHIC CLUB—FIFTH ANNUAL EXHIBITION.

To the EDITOR.

SIR,—Our Committee would esteem it a favour if you will kindly make it known to your readers that the last day for receiving entrance forms is

September 30, also that the following gentlemen have kindly consented to act as judges: Messrs. W. P. Christian, Julius A. Kay, T. Lloyd, and (for scientific class) W. I. Chadwick. Thanking you in anticipation,—I am, yours, &c., GEO. CROSS, *Hon. Secretary.*

September 21, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, revolving stereoscope of good make in exchange for No. 1 Frena hand camera with s t of Frena magnifiers, and isochromatic screen, and three packets of Ilford films.—Address, W. G. ORME, 94, Tettenhall-road, Wolverhampton.

Wanted, backgrounds in exchange for six specially painted backgrounds; also wanted, two good posing chairs in exchange for stereo camera and lenses by Dallmeyer, Warnerke's roller dark slide, and 15 × 15 portrait or enlargement camera.—Address, J. DOWNEY & SONS, 17 and 19, Eldon-street, South Shields.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

E. Landor, 2, The Mall, Ealing, W.—*Photograph of two kittens side by side.*

Joseph Smith, 7, George-street, Stroud, Gloucestershire.—*Photograph of fountain of ice taken during the severe frosts of January*, 1895.

R. MCKINLAY (Paisley Photographic Society).—We have no "prize slides."

SPOTTER.—The only thing we can suggest is to use more albumen or gum, whichever you employ, in the colour; also to apply it thinly.

W. N.—The method described is the right one to make chloride of gold from the alloyed metal. We are afraid we cannot help you further.

F. H. (York).—We have made no comparison with Taupenot dry plates and the most sensitive gelatine plates now in the market, so cannot give any real information. It would certainly be many minutes against small fractions of a second. Probably that will suffice for your forthcoming lecture.

NOVICE (Portsmouth).—Plant the camera perfectly level before bringing the swing back into play. Then, after arranging the swing back so as to get the perpendiculars right, focus afresh, and stop down the lens till all parts are sharp. We should advise you to get an elementary treatise on photography and study it—you will evidently be enlightened thereby.

M. W. E.—As "an amateur, to whom money is a greater consideration than time," we should not recommend you to attempt to albumenise your own paper, for in the end, and apart from the trouble, you will find that it will cost you more than you can purchase it for; and it is more than doubtful if the paper will be as good. The same remark applies to nitrate of silver.

E. DICKENSON.—If you do not get the paper from the maker, we should advise you to get the materials for making it from a reliable source, and compound them yourself instead of getting them made up at the local chemist's. By doing that you will know what you are dealing with. One of the materials mentioned we should not expect to obtain from an ordinary druggist.

S. BOURNE.—The list of prices is very low certainly, but you will be surprised perhaps, to know that, in some places in London and other large English cities, portraits are done for far less, in some instances for less than half. We have just received a price-list at our private house which quotes one cabinet and six *cartes* for half-a-crown, and a whole-plate portrait for the same sum.

T. GARDNER.—You will find what you wish to know about gelatine and alum in another column. As regards the paper, either the well-known Rives or Saxe papers will be the best for the purpose. Other papers, of fine quality, would probably answer quite as well, but those named can be relied upon on account of their purity. For the thicker kinds try Whatman's or Hollingworth's drawing-papers.

C. H. E.—Such pictures of still life would be very interesting if artistically produced. It is, as you say, a little surprising that photographers have given so little attention to making pictures of subjects such as groups of game, fish, fruit, and the like, when we are all so familiar with paintings by renowned artists of such subjects. Whether photographs of them would have a commercial value, "sell well," we are unable to say.

W. OSBORN.—The addition of a little antiseptic, such as oil of cloves, salicylic acid, &c., to the solution of gelatine will keep it from decomposition for several days during hot weather. Neither of these substances will have any injurious action on the photographs, but we recommend that the gelatine solution should be made in small quantities at a time, so that, notwithstanding the addition of antiseptics, it is used up within a few days.

R. W. asks why carbon enlargements are charged so much more for than enlargements on bromide paper of the same size, as he thinks it an imposition. Apparently, our correspondent is not aware that in producing a carbon enlargement a transparency, from the negative, has first to be made, and from that the enlarged negative from which the print is made. With the other process, the enlargement is made direct on the paper in a single operation.

ROB ROY.—We can give no actual information as to "the minimum quantity of hyposulphite of soda that can be safely used to fix a number of prints equal to a full sheet of paper." Nor could such information be supplied without knowing the proportion of silver salts in the paper. Hyposulphite of soda is so cheap that people do not, usually, consider how little will really suffice, but employ enough to make sure that the prints are properly fixed, and then with a good margin to spare.

BAZAAR writes: "At a bazaar that is shortly taking place here I have been asked to take photographs at night. Could you inform me the best and complete process that can be used for same. Of course, it would have to be some process whereby the positive could be delivered in a short time. The electric light is in the hall where the bazaar is to be held."—As the electric light is available, the wet-collodion process for glass positives or ferrotypes will be the best. Dry ferrotype plates will be next best, so far as results are concerned.

SALOP says: "I have some negatives that are over-developed and hard. There is plenty of detail in the shadows, but it is obliterated in the printing before the lights are sufficiently printed. If the negatives are reduced, I find that the shadows are reduced as much in proportion as are the lights, so that the result is much 'as before,' if not really worse. Can anything be done with the negatives, as they are otherwise good?"—We should recommend that the backs of the negatives be coated with matt varnish, and then, in the lights and dense portions, that it be scraped away, leaving only bare glass in those parts. If this is not sufficient, the deepest shadows may be supplemented with pieces of thin mineral paper.

NEW DEPARTURE IN MONTHLY MAGAZINES.—Commencing with the November number, the *Ludgate*, which has become the property of the *Black and White* Publishing Company, and which will have the benefit of all the resources of that concern, will appear in an enlarged form with a new cover. A variety of attractive features are promised by its conductors. In the November number will appear a series of facsimile letters by distinguished novelists on a matter interesting from a personal as from a literary point of view. The same issue will contain the first of a series of tales dealing with "The Romance of Poisons," by Robert Cromie (author of "The Crack of Doom") and T. Schomberg Wilson, who have hit upon a new field. One or two of the regular features promised are interesting and novel. Each number of the magazine, for example, will include a series of "snap-shot" interviews, by some of the ablest interviewers of the day, with the sort of person who, though possessing good stories and curious information, has never yet attracted the attention of the ordinary editor. Other features of a personal character will appear regularly. A section of the magazine will be devoted to the portrayal in pictures of the history of the preceding month. The fashions of the day will be treated in like style, while there will be other contributions specially designed for women readers. Prize competitions have been established with the view of enabling amateurs to test the quality of their essays in literature and in art. Books, plays, and pictures will be treated by writers of repute. The magazine will be crammed with illustrations from beginning to end, and its conductors promise that it shall henceforth be the biggest and the best of the "Sixpennies."

CONTENTS.

	PAGE
OUR FORTHCOMING ALMANAC	609
LARGE PAPER NEGATIVES	609
GELATINE AND ALUM	610
THE PHOTOGRAPHIC SALON	611
PHOTOGRAPHS FOR BOOK ILLUSTRATIONS. By T. N. ARMSTRONG	613
HOW I WAS NEARLY HAD	614
THE LEEDS EXHIBITION	615
PHOTOGRAPHY: PRACTICAL AND ARTISTIC. By WILLIAM F. MILLER	616
THE ONE THING. By J. M. APPLETON	619
THE OUTSIDE SPECIMEN DISPLAY AS A BUSINESS PERSUADER. By JOHN A. TENNANT	619
PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM	620
ROYAL CORNWALL POLYTECHNIC SOCIETY'S EXHIBITION	620
NEWS AND NOTES	621
RECENT PATENTS	621
MEETINGS OF SOCIETIES	622
FORTHCOMING EXHIBITIONS	623
CORRESPONDENCE	623
EXCHANGE COLUMN	624
ANSWERS TO CORRESPONDENTS	624

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1848. Vol. XLII.—OCTOBER 4, 1895.

OUR FORTHCOMING ALMANAC.

The Almanac for 1896 being now in course of preparation, we take the opportunity of inviting our friends to contribute to its pages short practical articles descriptive of their recent experiences and experiments in photography. The popularity and value of the Almanac have always been largely due to the inclusion in its pages of many contributions from photographers of great ability and knowledge, a feature in which we cordially invite the co-operation of our readers in all parts of the world.

We shall also be glad if intending contributors will let us have their articles, sketches, &c., at as early a date as possible, so that the risk of their having to be omitted through lateness of arrival may be obviated.

Secretaries of Societies, and especially of those founded during the year, if they have not already done so, will oblige by at once forwarding lists of officers for inclusion in the directory of photographic Societies, so that this section of the Almanac may be made as complete as possible.

COPYRIGHT MATTERS FROM THE OWNERS' STANDPOINT.

We have been made aware of so many comments on this now burning question that we return to the subject with the view of aiding those photographers who possess copyrights by discussing the matter from a practical standpoint.

There are two considerations which must be well borne in mind. First, it is incontestable that a vast amount of prejudice exists against legitimate copyright-holders by the action—dishonest in intention, or utterly illegal, in fact—of many possessors of negatives representing subjects or persons that have suddenly become famous. The large majority have erred through ignorance; knowing the negative suddenly become valuable, they are under the impression that by registering it it is at once copyright, the ownership vesting in them, though they have received payment or "consideration" for copies supplied from it. Let it be understood at the outset that once a copy has been sold, and no agreement come to as to the ownership of copyright, no claim can be enforced for damages, or injunction to restrain. For a copyright to be in form, an agreement at the time must be come to whenever a consideration for a copy or copies has been received.

Turn we now to the others, who know all this, yet calmly register the picture, and mark it copyright, sometimes even preferring doing the latter act without going through the preliminary formality. Now, this, we aver, is downright fraud, and its frequent perpetuation has reacted in the highest degree to the prejudice of honest owners. We will not enter here into any question of moral right to claim for use of the product of the photographer's brain; it would open out too large a question. It is, however, well known that one leading illustrated paper officially announces that it makes payment for all photographs used in its pages, a striking contrast to the action of others, which not only make no payment, but are discourteous enough to entirely ignore the producer of original photographs that gives value to their pages.

This leads us to the second consideration we named. There are publishers *and* publishers, with editors or no editors as their mouthpieces. Whenever a payment is made, it is, of course, from the publisher, not the editor. Now, it is notorious that one editor behaves with a mixture of conspicuous and brutal dishonesty with the utmost insolence whenever a claim is made out of which he thinks he can, to use a transatlantic phrase, bluff the owner of the copyright. We would wish that he was apart from the rest, but he is so only in degree. We have before us as we write a letter from another of his kind. A professional photographer took a negative of a specially artistic manufactured article, for the express purpose of sending it to the illustrated papers, with the entire approbation of the producers. When it was offered to this person, he did not content himself with rejecting it as unsuitable, but actually lectured the photographer for endeavouring to make money out of other people's manufactures.

Now, as against this, we have, on the authority of Mr. Whatmough Webster, an account of an honest and open recognition of proprietary interest in a portrait picture quite apart from any question of copyright. Mr. Whatmough Webster exhibited, at the last Royal Photographic Society's Exhibition, half a dozen of the subjects we know he revels in—children's portraits. A publisher wrote to him, expressing admiration of three of them, asked no question of copyright, and offered a guinea each for permission to reproduce them in colours. Mr. Watmough Webster assented, on the condition that the parents' consent was given. This was written for in each case, and permission gladly granted. At once the three guineas were sent, although the publication might not take place for two or three years.

It is thus evident there are two classes of possible copyright users to deal with. In the one case the matter may be left to

right itself; in the other—the far more numerous, we are afraid—the photographer's interest will go to the wall unless he invokes legal aid.

Every one knows how costly this is, and how liable to lead to miscarriage of justice. A recent case of the kind lost by the photographer cost him, we are credibly informed, over two hundred pounds. Few photographers have the means or the inclination to take this risk, and they, with a sore feeling, let their claims lapse by default. The vast body of genuine copyright-holders may be likened to the bundle of sticks of the proverb, but they are the sticks loosened. Their only remedy is to combine, and, fortunately, the initiative is taken. There is now existing—as many do not need to be told—a Photo-Copyright Union, supported by a trifling annual subscription, which might with advantage be made merely nominal, for combination and numbers, rather than money subscriptions, should be its watchword. The object of this Union is to give advice to its members, to inform them if they have a good case, and take it up on a sharing principle of gains and losses if it appears to them valid. Its mode of working may, perhaps, be capable of improvement, but it is only in its infancy, and may grow into a big maturity.

The suggestion has been made to us that, as there is usually, in the early days of the Royal Photographic Society's Exhibition, a large influx of photographers from all parts of the country, the present would be an excellent time for a number of them to come together, compare notes, and arrange concerted action. Leaving the carrying out of this suggestion in the hands of our readers, we again remind them of the fable we have quoted.

THE INTENSIFICATION OF PROCESS NEGATIVES.*

Particular stress has been laid upon the necessity of starting with the negative in a condition to bear intensification, but this condition will vary with the method to be adopted, as well as, in a measure, with the process by which the negative is made. Commencing with a wet-plate negative, developed with iron or pyro, which, after fixing and thorough washing before leaving the dark room, shows perfect clearness in the shadows without the application of a clearing solution—which, in fact, is perfectly free from any deposit in the portions not acted upon by light—the image will be in a condition to bear any reasonable amount of intensification by any method without fear of filling up or veiling the lines or dots; but, when a clearing solution has been used, it cannot yet be said to be absolutely beyond danger when the intensification is performed with pyro and silver, although it may be when any of the methods are followed in which the extra density is obtained by other than the "piling-on" plan.

For this reason, no doubt, it is that the various processes, in which mercury, the alkaline sulphides, bromide of copper, and salts of lead are the active agents, find greater favour with process workers than the ordinary silver method employed in half-tone work. Not only do these methods lend themselves very readily to the production of absolute opacity, but they attain this end without the exercise of any *developing* action, which is always present when a reducing agent accompanied by silver nitrate is employed. It thus results that, with an image such as has been described, with absolutely no deposit on the clear portions, and *perfectly washed*, there is literally nothing in those parts upon which the intensifying solution can act, and its full power is exercised upon the actual deposit without any danger of "filling up." With such an ideal image, when it is obtained, the purely chemical methods of obtaining density are absolutely safe.

But, in following the pyro and silver method, the case is different, as the developing action of the solution must also be taken into account, for, although the shadows may be perfectly clear to start with, it is extremely easy, especially in the finer, closer lines, to considerably veil, if not to altogether block, them. This effect is almost entirely due to the persistent action of the light in the film when the latter has been once impressed, from which it results that, if any slight action should have taken place in the shadows, which, from short or arrested development, has not been made apparent, or, if it has, has been removed by means of a clearing solution, the intensifier is always liable, and, indeed, almost certain, to bring it into prominence.

The older workers of wet collodion, especially if of an experimental turn, will be quite familiar with the fact that, if the image after fixing be treated with dilute nitric acid, a solution of acid nitrate of mercury, or of iron alum, or, indeed, by any method by which it is entirely dissolved, and nothing left but the clear collodion film, so great is the persistence of the light's action that a perfect image may be again developed by the application of the usual iron or pyro developer; perfect, at least, if the film has been thoroughly washed between the various operations. This result can be repeated several times with the same film before the action of the light is lost, and possibly it might go on indefinitely if really thorough washing could be ensured after each different operation.

When silver intensification is to be adopted—and, in the case of a thin initial image, this is the only really effective plan—some additional precautions must be taken to prevent further developing action, or the recurrence of any veil that has been cleared away by means of iodine and cyanide of potassium. For this purpose the most convenient and, at the same time, most efficient means is found in a tolerably strong solution of bichromate of potash applied to the plate after fixing, or, if such be used, after the clearing solution. The effect of the bichromate, as well as certain other oxidising agents, is, as Captain Abney showed nearly twenty years ago, to destroy the latent or persistent impression produced by light in the film, and thus to destroy the tendency that otherwise exists to block the shadows in intensification.

The strength of the bichromate solution may be conveniently one of five per cent., in fact, the ordinary sensitising bath for carbon tissue, and it should be applied for at least a minute when the plate has been well washed after fixing or clearing, as the case may be, and preferably before the plate has been taken out of the dark room. In such delicate work as the production of process negatives, it is essential that every precaution be taken to avoid fog, and, although it is scarcely noticeable in every-day negative-making, it has been ascertained that a plate is still appreciably sensitive to light after fixing until the soluble salts have been entirely removed by washing. Moreover, if an imperfectly washed negative be treated with a solution of iodine, a minute trace of iodide of silver will be formed in the film, and this, if allowed to be acted upon by light, is subject to the developing action of the intensifying solution when that is applied, and so produces a more or less pronounced veil. This may not be sufficient to prove detrimental in a half-tone negative, as is proved by the common practice of intensifying after fixing in full daylight, but such a course would be, to say the least, highly dangerous

* Concluded from page 595.

in the case of a line negative. The bichromate solution is, of course, supposed to counteract any action thus set up; but, on the principle that prevention is better than cure, we strongly advise that the whole of the processes be carried out in the dark room.

The use of the bichromate solution is of even greater importance in another direction. Frequently, when a reversed negative is required, or when it is necessary to reproduce a negative from a negative, it is convenient to adopt what is known as the reversal process—that is to say, a positive is taken upon a plain bromide plate, developed with alkaline pyro considerably further than if it were to be used as a positive, and then, without fixing, treated with dilute nitric acid, or iron alum, so as to dissolve the image so formed. This gives a *negative* image in bromide of silver, which, after washing and brief exposure to light, is reduced by a second application of the alkaline developer. If the image left in bromide of silver were intensified with pyro and silver, or redeveloped by the acid silver method, the result would be an even blackening of the whole film consequent upon the persistent action of the light already referred to, which would cause the recurrence of the image already removed in addition to the reverse one.

On this account, therefore, it will be seen that such reversed negatives, if they require intensification, must be treated by one or other of the methods which do not possess developing powers, unless the previous action of light be annulled by means of the solution of bichromate of potash, when, if the treatment be carefully and thoroughly performed, they are amenable at least to silver intensification. The redevelopment should in every case be performed with alkaline pyro, as this by the reduction of the silver remaining in the film, forms an, image that requires comparatively little added density, whereas, if the acid silver method be followed, the whole work of both development and intensification is thrown upon the one solution, which, in consequence, can only be expected to exhibit its weak points in an exaggerated degree.

While on the subject of the reversal process, it may be remarked that, where applicable, this is particularly adapted to the requirements of process work, as, when properly worked, it is capable of giving, with the same or a less amount of trouble, far clearer lines than the direct method. It requires some little practice, however, to arrive at the exact point to which to carry the first development, so as to reduce the silver through the whole thickness of the film in those parts that are to be transparent without at the same time veiling to too great an extent those portions that are to be subsequently rendered opaque, for every atom of silver reduced in the shape of fog tends towards lessening the density of the final image. At the same time such reduction of the image is a far less difficulty to contend with than the elimination of fog in the ordinary process, and, if not excessive, is of little moment when efficient means are adopted for intensification.

Before proceeding to that part of the process it will most probably be needful to adopt a clearing method, and this is better performed after the reduction of the final negative image for more reasons than one. In the first place, from the colour and delicacy of image in bromide of silver, it is extremely difficult, if not impossible, to distinguish the very faintest gradations, and therefore to see how much, if any, vei exists in the shadows, but this becomes much more distinctl after the reduction. Again, if a clearing solution containing iodine be applied to the bromide film, a portion, and perhaps a considerable portion, of the latter will be converted into iodide which is practically unacted upon by alkaline pyro.

A clearing solution that is free from that objection, and which we prefer on other grounds either for this or ordinary wet-plate negatives, consists of a solution of common salt in commercial nitric acid. Take, say, a teaspoonful of salt, and add it to an ounce of the acid, with sufficient water to secure its solution if it refuses to dissolve otherwise, and keep this as the stock solution, diluting it for use until its action is sufficiently gradual. By the reaction of the two ingredients *aqua regia* is formed in the solution, and this acts in a peculiarly favourable and uniform manner in removing slight veil. In a negative apparently perfectly clear in the shadows, this solution, by the formation of a delicate pearly-white deposit, visible from the back, will reveal the fact that reduced silver has been present, and the chloride thus formed is then removed by means either of hypo or cyanide, after which the plate is to be passed through the bichromate solution previous to intensification.

The Peary Expedition.—Lieutenant Peary and his two companions are now on their way home. The expedition has been more or less a failure, and the explorers have had to endure the greatest hardships and privations. In those details that have been published there is no mention of photography and how it fared. In this expedition, as with all the recent Arctic ones, photography was to play an important part. Many, therefore, have looked forward with interest as to how gelatine plates and films would behave after being subjected to extreme and prolonged cold ranging from 30° to 45° Fahr. below zero. However, we fear we must not anticipate much information for some time to come.

The Spy Scare again.—According to the German newspapers, several persons have, during the past week or two, been arrested as spies in connexion with an alleged espionage promoted by the French, the chief object being, so it is said, to obtain details of the manufacture of the German guns, and to secure drawings of defence works. Nothing is said in the reports as to photography, or whether it was in use. It is pretty evident, however, that if, just now when excitement and suspicion is at its height, any luckless tourist is seen photographing in the neighbourhood of fortifications, he will subject himself to very unpleasant treatment. Therefore let English tourists, who may be spending their autumn holidays either on the German or the French frontiers, be very cautious of what they do, and where they plant their cameras, or at least till the present scare has subsided.

Processes at the Exhibition.—The annual photographic Exhibition may generally be taken as an indication of the processes most in favour by the majority of the leading workers in photography. It is therefore interesting to note the statistics. Out of the 365 frames shown, where the processes by which the prints were produced are given in the catalogue, leaving out the mechanieal methods, we find that there are 176 platinums, 110 carbons, 41 gelatino-chlorides, and 26 bromides. The remaining 24 are variously described as silver, platinum toned, albumen, &c. It is gratifying to think, for the credit of the art, that the processes that yield the most permanent results, and at the same time the most artistic ones, are those most in favour. Each year, for several past, there has been an increasing tendency in this direction. It is a noteworthy fact that the photogravures shown are but four short of the bromides, 22 of the former as against 26 of the latter. The above figures, however, must not be taken as indicative of the proportional numbers of the prints turned out commercially.

Another Lucrative Appointment Open.—Some little while back, it will be remembered, there was a number of letters in

these pages anent the wage offered for photographic skill, labour, and experience—namely, twelve shillings a week—a seven days' week, with board and lodging. It was said there were several applicants for the berth. In our advertisement columns last week almost as good an appointment is offered. It reads, "Photo-Operator wanted, all-round hand, constant employment. Salary 21*s.*" It is not mentioned how many days' labour per week for this munificent sum is expected; but, as the applications are to be made in a district where we should expect Sunday sittings would not be refused, we should say it would not be *less than six*. In face of the prices now paid by some employers, is it at all surprising that a letter has been issued by the Photographers' Benevolent Institution calling a special meeting to consider, in certain alternatives, what steps should be taken to wind up the affair? It has been said that those in whose interests the Association was started did not support it. But how, it may be asked, could men, perhaps with families, with such pittances as these subscribe to the funds? Yet they were the greatest drains upon them.

The Poisons Act.—That Trades Union, the Pharmaceutical Society, have been raiding photographic dealers again for selling chemicals used in photography scheduled in the Pharmacy Act. This time they have given our friends up North—Edinburgh—a turn, and, in this instance, they claim a greater monopoly than usual, namely that it is illegal for any one to use the term "chemist" who is not registered as a "pharmaceutical chemist." In one case the defendant had on his facia "photographic chemist"; but, as it was a corner shop, chemist could be read from one point without the qualifying term. On reference to the Pharmacy Act of 1868 we find the first clause enacts that it is unlawful for any one "to assume or use the title 'chemist and druggist,' or chemist, or druggist, or pharmacist, or dispensing chemist or druggist, in any part of Great Britain, unless such person shall be a pharmaceutical chemist, or a chemist or druggist within the meaning of this Act, and be registered under this Act." This will probably be news to a great many people. One of the defendants told the Court that the science of chemistry was much wider than the science of pharmacy. We should think so too. What say the members of the Chemical Society and the Society of Chemical Industry, &c.? In one case a witness for prosecution, a chemist and druggist, was asked how many persons the ounce of bichloride of mercury sold would kill? He replied that he did not know, "but he thought it would decimate half the town, it was so deadly." As there are something like 300,000 inhabitants in Edinburgh, and as there are only 437½ grains of the bichloride in the ounce, it is easy to calculate how many persons, according to the idea of this chemist and druggist, a single grain of the salt will kill. The British Pharmacopeia gives one-eighth of a grain as a medicinal dose. Possibly, had this "duly qualified" been asked for an antidote for the poison, he might not have shown any greater knowledge than he did as to the toxicological properties of bichloride of mercury. An important point is raised in one of the Edinburgh cases. The Pharmacy Act allows of the sale of poisons in wholesale dealings, but they must be labelled "Poison," &c.; but it has not yet been decided what is a wholesale quantity. A few grains would certainly be a retail quantity, but what constitutes a wholesale one?

ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Fortieth Annual Exhibition of the Royal Photographic Society was thrown open to the public on Monday last. An innovation, in the shape of a private view, was tried on the afternoon of the preceding Saturday, and it proved thoroughly successful, between 300 and 400 ladies and gentlemen responding to the Council's invitations. The opportunity of viewing the photographs in the daytime appeared to be so much appreciated that we do not doubt this new feature will be permanently availed of.

Very gratifying, too, was it to find that, notwithstanding the great success of the private view, the *conversazione* in the evening was just as much appreciated as hitherto, the attendance numbering about 430. Sir Henry Trueman Wood (the President) received the Society's guests, being supported by the following members of Council:—Messrs. G. Scamell (Hon. Treasurer); Chapman Jones (Hon. Secretary); Bedding, Bridge, Sebastian Davis, Debenham, William England, Hepworth, Mackie, Marchant, Traill Taylor, Wilmer, Clifton (Hon. Librarian), &c.

Among those present were:—Dr. G. McDonald, Messrs. E. Baynes Rock, A. J. Johnson, W. J. Ramsay, Miss Hicks, Messrs. W. C. Burdett, T. Samuels, Misses E. Hillman, L. Way, Messrs. Charles J. Kirk, C. W. Nettleton, Mr. and Mrs. Sharrock, Messrs. T. R. Shervinton, E. C. Fincham, C. E. White, W. H. Coleman, S. E. Wall, Fred Marsh, R. W. Craigie, C. F. Townsend, R. B. Lodge, C. Harold Smith, O. Sichel, G. Davenport, G. Inskipp, Miss Margaret Watson, Mr. M. J. Swift, Mr. and Mrs. Birt Acres, Messrs. E. S. Shepherd, H. W. Teed, W. L. Prosser, F. W. Hindley, R. R. Beard, H. Cooper, Professor W. C. Unwin, Messrs. J. H. Avery, F. T. Beeson, N. A. Monnickendam, Mrs. R. L. Kidd, Messrs. S. Herbert Fry, H. M. Smith, Dr. Hall Edwards, Miss M. E. Polson, Messrs. J. A. Sinclair, H. Grover, J. C. L. Knight-Bruce, W. J. Hollebone, S. W. Owen, Professor W. A. Tilden, F.R.S.; Messrs. W. Ethelbert Henry, J. G. Gibbs, A. Burchett, G. H. James, G. F. Gregor Grant, W. B. Goodwin, Dr. Ingoldsby, Messrs. E. R. Mattocks, G. W. Welham, W. Gamble, J. S. Teape, S. B. Bolas, Miss E. L. Moysey, Mr. and Mrs. L. Medland, Messrs. E. Scamell, C. Beadle, J. Hallifax, W. H. Taylor, A. J. Taylor, J. C. S. Mummery, the Misses Birtles, Mr. J. Birtles, Miss Davis, Messrs. C. E. Rendle, Hector Maclean, F.G.S.; J. W. Tate, A. H. Wall, W. C. Plank, W. Martin, jun., John Fallows, H. E. Davis, C. A. Palmer, Dr. J. J. Acworth, Messrs. J. J. Holloway, E. H. Fitch, F. W. Muncey, J. W. Walker, C. Stuart, W. Thomas, C. Dixon, T. Stockwell, jun., Thomas Clapton, J. H. Agar Baugh, Mr. and Mrs. J. A. Hodges, Mr. and Mrs. Walter Gardiner, Messrs. J. B. Spurge, Wm. Cheshire, J. A. Williams, R. P. and Miss Drage, Messrs. F. A. Bridge, J. C. Lanceley, F. Adams, F. Crosbie, J. Gunston, Rev. F. C. Lambert, Messrs. E. W. Hawes, F. Downer, Thomas Fall, A. Kemp, Mr. and Mrs. G. W. Atkins, Messrs. A. Haddon, A. Champness, R. R. Monk, F. R. Ball, J. E. Shaw, P. G. Hunt, Oscar Blyfield, F. J. Lloyd, Mr. and Mrs. Rudowsky, Mrs. Massey, Messrs. Freeman Dovaston, G. J. T. Walford, E. Marriage, Miss Thomson, Mr. and Mrs. H. Snowden Ward, Mr. John Pride, Councillor Wightman, Messrs. Pollak, Seymour Conway, H. Smith, C. S. Scott, T. E. Freshwater, H. Smart, G. W. Tottem, Bernard Alfieri, J. H. Oliver, W. M. Wonnacott, W. A. Locks, E. W. and Miss Foxlee, Mr. and Mrs. C. G. E. Milne, Messrs. H. D. Gower, A. E. Smith, H. M. Dennes, W. E. Wright, J. B. Panting, A. Horsley Hinton, A. J. Campbell, Claude Spiller, A. Spiller, R. H. Head, G. B. Harland, Miss N. Edge, Messrs. J. S. Hodgson, G. W. Webster, H. W. Bennett, J. Hay Taylor, and many other ladies and gentlemen.

Some Statistics of the Exhibition.

It has hitherto been our custom to give our readers a few figures relating to the Exhibition, which we have found to be so welcome for both comparative and particular purposes, that we need offer no excuse for carrying on the charter. The following tables show how the Exhibition compares, in certain numerical respects, with those of the last three years:—

	No. of Exhibits, including Apparatus and Transparencies.	Total number of Exhibitors.	No. of Exhibitors members of the Society.	No. of Medals awarded.
1892	693	202	64	17
1893	395	160	49	9
1894	540	194	62	14
1895	511	206	76	12

As regards the printing processes selected, it is next to impossible to get absolutely reliable data. The following figures, however, are approximately accurate, being compiled from the particulars wherever given in the catalogue:—

	1894.	1895.
Platinotype	175	185
Carbon	88	110
Bromide	57	26
Gelatino chloride	48	41
Photogravure	15	22

We have omitted albumen-silver, collodio-chloride, and collotype from the list, for the reason that the number of prints made by those processes that are exhibited is very small, and of no importance for comparative purposes.

The Catalogue.

The happy thought of illustrating the catalogue occurred, we believe, to Mr. Child Bayley, and the Council and all concerned must feel glad at the thorough and excellent manner in which the idea was seized and reduced to practice. It is no small triumph for the Society and for photography that concurrently with the opening of the Exhibition a beautifully printed catalogue, containing nearly seventy line and half-tone reproductions of pictures hanging on the walls was at the disposal of the visitors. The pictures selected for reproduction have, in the main, been judiciously chosen, although two or three of the more conspicuously successful works—notably those by Mr. Bennett, Mr. Sinclair, and Mr. Keene—are not included, probably on the ground that photography could scarcely do their fine qualities of atmosphere and light and shade full justice. All things considered, the half-tone illustrations are decidedly good, and we are sure the catalogue will be widely valued.

The Exhibition and the Awards.

The Judges this year were: in the Art Section, Mr. W. L. Colls, Colonel Gale, Mr. F. Hollyer, Mr. B. Gay Wilkinson, and Mr. W. L. Wyllie, A.R.A.; and, in the Technical Section, Captain Abney, Mr. Chapman Jones, and Mr. Andrew Pringle; and their awards appear, on the whole, to give general satisfaction, although in each section there is an instance in which popular sympathy may be withheld from the Judges.

The Exhibition is not remarkable for the high character of its portraiture, but in other respects not much fault can fairly be found with it. A second and third examination of the display has made it manifest to us that the best of the work shown is probably the best work yet produced, a degree of praise beyond which it is neither necessary nor possible to pass. There is a wealth of quality and a variety of interest in the Exhibition which go to make it attractive and instructive to every photographer, no matter in which branch his *forte* may be, and that more than justifies the silent contempt with which the Society views the fruitless efforts of a few fanatics to brand the Exhibition as a purely "scientific" one, and to deny it the inclusion of any art productions.

The Medal Pictures.

The medals are distributed as follows:—Mr. Lionel C. Bennett takes one for *Inward Bound* (No. 68). It is a study of fishing craft beating up the river, with the Tower Bridge in the background. Printed in an effective red tone, and displaying careful and cultivated artistic treatment, this softly rendered little picture, which is full of quiet charm and natural-looking effects of atmosphere, well deserves its distinction.

Mr. Roderick Fry, in *Parting Day* (No. 69), makes a taking picture out of a simple theme, the lights and shadows being well balanced. The composition is good, the broken foreground, the sweep of water, and the tree-topped uplands lending themselves well to artistic effect. We congratulate Mr. Fry, a painstaking worker, on his success.

Mr. F. P. Cembrano's medal picture is No. 117, *A World of Smoke*. A vast cloud of black smoke issuing from the funnel of a small steam vessel curls over the water towards the land. Good though the result may be, we are of opinion that Mr. Cembrano shows much better work in some of his other exhibits.

Sunset on Lake Iseo (No. 164) gains Mr. J. A. Sinclair a medal. It is a beautiful study of sunset over the waters of a lake, in which the effect of the reflections is capitally rendered. Well printed in carbon, this forms a delightful photograph to contemplate.

No. 187. *South-East Processional Aisle, Winchester Cathedral.* One of a series, gaining Messrs. Bolas a medal. It is a perfect example of interior work. In the matter of well-exposed, well-printed, and well-chosen interior work, Messrs. Bolas are just now unexcelled.

No. 269. *Scurrying Home.* Mr. Stieglitz, in our opinion, has done, in this excellent photogravure, quite one of the best bits of work in the whole Exhibition. Two women, looking not unlike French peasants, are hurrying over a stretch of land towards a distant church. The figures, which are slightly bent forward, suggest motion as we rarely see it suggested in a photograph. Millet himself might have handled a similar theme, but he would not have made the feet of the women look so ponderous. For all that, Mr. Stieglitz has given us a good and convincing picture.

No. 301, *Castle Garth, Newcastle*, by E. G. Lee, a bit of old Newcastle, having a bold and striking effect, and well printed on rough carbon paper to suit the subject. A girl, with folded arms, stands idly at a doorway, and this helps to give the photograph a touch of "life."

No. 381, *A Derbyshire Dale*, by C. B. Keene, a charming study of a pretty view, having exquisite effects of atmosphere and softening distance. We are glad to see the honoured name of Keene still to the fore in the production of good photographs.

No. 411.—Mr. W. Bush shows an enlargement to life size of the negative of a starling. It is really very good; but, in the absence of specific reasons, we fail to understand why it was awarded a medal.

No. 445.—Mr. R. B. Lodge's medal is obtained for a series depicting puffins, cormorants, lesser black-backed gull, and kittiwakes. These "fearful wild fowl" were, we believe, taken by means of a tele-photo lens. The photographs are wonderfully good.

No. 461.—Mr. Ernest Marriage takes a medal for a series of twelve lantern slides, showing architectural details in churches at Parma, Milan, Verona, and Venice.

There is much to deserve praise and cause delight in the remaining exhibits, which are of a very diverse character; but here and there we meet with opportunities for pointing out avoidable faults. The very first picture catalogued, *Greek Study* (No. 1), by Mr. Lankester, gives us such an opportunity. This classic effort would, we think, have been more successful if the lady's draperies had not been so "bunched up"; if, in fact, they had been arranged to give her the appearance of greater slenderness. The series by Mr. Pringle, *Emotions* (No. 4), portrays a lady whose variety of facial expression comprehends a large part of the gamut of the human emotions, and deserves notice for being a credit to Mr. Pringle and to the facial mobility of the "untrained model." The figure study, *Une Bayadère* (No. 14), by Mr. Bergheim, is noticeable for the ease and grace of the attitude; and in *Sorrow* (No. 28) the same gentlemen manages to impart a haunting effect of refined mournfulness to the lady's face. The figures of the children in Mr. E. G. Lee's *Chat on the Bridge* (No. 57) are not particularly well disposed; it is a fine photograph of a commonplace subject. We lay emphasis on the awkwardness and artificiality with which so many exhibitors here invest the figures in their landscapes and so forth, in the hope that we may be humbly instrumental in directing profitable attention to the need of much greater skill and pains in their effective posing and grouping, and, above all, in their harmonisation with the nature and sentiment of their surroundings.

Mr. Ralph Robinson's portrait and group studies (Nos. 59 to 66) are particularly dainty bits of work, and Mr. R. W. Craigie's *Miss Helen Henschel* (No. 74) is a happy and unconstrained portrait study. A compliment is certainly due to Mr. G. Pendry for his clever *Dogs* (No. 87), some of the best examples of animal photography in the room. Uncommonly good and effective, too, is Mr. Walter Edmund's *Westminster by Night* (No. 71), a view from St. Thomas's Hospital, with the lights, and reflections, and dark piles of buildings on the Middlesex side showing up well. Mrs. Catherine Weed Ward shows a portrait of the veteran journalist, *A. H. Wall* (No. 114), which is a capital likeness, though the lights on the face are perhaps a bit too hard. At least two of Mr. Cembrano's pictures are, in our opinion, miles ahead of his medalled exhibit. We allude to *Sunset on the Clyde* (No. 118, showing the dusk settling down over the crowded river, and a highly successful rendering of Scotch firs (No. 120). *White Aster* (No. 134) is a charming name given to the charming picture of a pretty little girl; it is, we believe, one of Mr. Horsley Hinton's first attempt at portraiture, and is both pleasing and natural in treatment and effect. Lifelike to a degree is Mr. F. Hollyer's jovial portrait of himself (No. 141).

Mr. Charles Moss, in *After Sundown* (No. 203), shows an effective rendering of the advance of night, but the deep shadows are perhaps a little too heavy. *The Writing Lesson* (No. 215) is a title given to

a representation of a young lady low down in her teens engaged with her pen. The complacent-looking damsel might be writing to a sweetheart; she does not look as if she was practising penmanship. We refer to this photograph as an illustration of the common phenomenon to be seen at this Exhibition, namely, the facility with which a photographer can persuade himself to fit his photograph to a misleading or unintelligible title, or *vice versâ*.

Unstinted praise is due to Mr. W. M. Warneuke's *For Ilka Lad a Lass is Waiting* (No. 219), three women grouped on the seashore in expectant attitudes. It is a prettily conceived and composed picture, with a pleasing sentiment, and quite deserves a medal. Mr. H. T. Malby fails in *When Woods in Early Green* (No. 224) to give the water the necessary sparkle the subject possibly demands. We note a good portrait of *Mr. W. S. Bird* (No. 226) in photogravure by the Autotype Company, and we suggest that Mr. Bird has some ground of complaint against the Company for giving the picture such a bilious tone. Two studies of stream and cloud, by Miss Janet Reid are treated to give breadth of effect, and form beautiful renderings of simple themes. Mr. Lyd Sawyer has four studies typical of *Faith, Mirth, Sorrow*, and *Fear*. The ladies are somewhat theatrically posed, but the respective expressions are good although the contrasts of light and shade are too great. Perhaps the best and most piquant is *Mirth* (No. 244). We are sure that Mr. Charles Moss only just escaped receiving a medal for *Homeward Bound* (No. 251), a man proceeding along a lonely, winding road, illuminated by a hard and cold light. It is a realistic study. In *At Humanity's Call* (No. 250) Mr. J. C. Burrow shows a number of men preparing to launch the lifeboat to go to the rescue of those on a sinking steamer. Some tameness pervades this otherwise excellent photograph of a difficult subject, possibly because the popular imagination is apt to associate the launching of the lifeboat with dark and thunderous weather and boiling, tempest-tossed waves. *Weary go the Feet when the Heart is Old* (No. 279) does Miss K. G. Spink credit. It is a quiet little study of a bent old lady trudging through the snow. Another subject by Miss Spink, *Daughters of the Soil* (No. 262), two women apparently weed-burning, shows great dexterity in the arrangement of the figures. Mr. Golding has adopted an unpleasant pea-soupy tone for his two views, *Drear and Bleak* (No. 306) and *The Calm of Eventide* (No. 319). *Tittle-tattle* (No. 321), by Mr. D. G. Ritchie, shows two young people gossiping by the wayside; but, as we have remarked of similar ambitious efforts, the figures are poorly managed. On the other hand, singular grace and charm characterise the figure of the lady in *Through the Woods* (No. 345), by Miss Stoddart, an effort entirely worthy of Boughton, of whom this pretty study reminds us. Mr. Stieglitz, again, is remarkably successful with the figure of the woman in *Mending the Nets* (No. 351), a good effect of light and shade.

Mr. J. C. S. Mummery disappoints us this year. We were justified, from past experience, in anticipating something exceptionally fine from his hand, but it has not come. *Will it Mend?* (No. 353) is the title he gives to a representation of a man in a field contemplating a broken gate on the ground. So far as the picture goes, it is well executed, but the subject irritates us. We put it, that neither we nor anybody else can feel the smallest gleam of interest in so trivial a matter as a broken gate, and the question of its repair. The subject doesn't stir our sympathies; the soft and sentimental side of our nature remains unmoved; we absolutely care not a rap about the fate of that wretched gate, and how on earth Mr. Mummery came to take so much interest in it is a mystery to us.

As for the remainder of the pictorial exhibits, brief mention must suffice for the photogravures shown by Mr. Wilmer and Mr. Dennison, although the qualities of their results vary a great deal. Mr. J. A. Hodges' landscape work is very fine, notably his *Evening* (No. 49), a lovely and truthful effect. Mr. J. W. Marchant's architectural studies are beautiful in technique; Mr. J. H. Avery, Colonel Gale, Messrs. B. G. Wilkinson, Burchett, Seymour Conway, Rev. H. B. Hare, the Duchess of Sermoneta, Messrs. Dockree, Brownrigg, Kidson Taylor, and W. Thomas are represented at their best in landscape work. On the other hand, several contributors of portraits, whom in mercy we refrain from naming, seem to have mistaken the Exhibition for their own show-cases, and we are certainly of opinion that those responsible for the selection showed a lamentable neglect in admitting so much rubbish. *Per contrà*, the portraits sent by Mr. Meyer (No. 105), Mr. W. R. Cassells (his *Ianthe*—No. 199—is, to our thinking, a very graceful portrait), and the lady reading and smiling (No. 264), with a few others, redeem this portion of the Exhibition from absolute failure.

In the purely scientific part of the Exhibition much interest, no doubt, will centre in the admirable examples of colour collotypes sent by Messrs. Bolas & Co., the negatives for which were taken by Mr. Wall and Mr. Bolas. The Autotype Company have many fine reproductions of paintings in photogravure and carbon, and the latter kind of work is exemplified to perfection by examples from Messrs. Elliott, of Barnet. Messrs. Morgan & Kidd and Mr. R. F. Barnes have specimens of ceramic work. Mr. Fall and Mr. Sandland have studies of lions and other animals. Mr. Stevens sends two cat photographs, which are very good, although the animals seem to us to have realised that they were undergoing the operation of being photographed. Mr. Henry Little's *Courtyard of the Bagello, Florence* (No. 356), is marked by great beauty of technique and skill in selection. Mr. G. Watmough Webster, who is unkindly skied, has a clever and interesting study representative of *Terns and their Haunts* (416), from a life-history group at the Grosvenor Museum, and an amusing, but natural, study of a child and a dog amicably and mutually taking their ease in company, *Arcades Ambo* (No. 432) Mr. E. S. Shepherd's examples of irregular-grained screens, should attract the attention of process workers. *Valkyrie III.* is depicted by Messrs. West, and Mr. Bedford Lemère's reproductions of statuary are very ably done.

Here, for the present, we are compelled to postpone further references to this part of the Exhibition.

The Apparatus.

It is not a little remarkable, and we think it matter for regret, that dealers and manufacturers do not avail themselves to a greater extent of the advantages to be derived from submitting their wares to public inspection at the Annual Exhibitions of this Society. A few are certainly enterprising enough to do so, and to reap the benefit thus arising, but the great bulk of them abstain from exhibiting. It is well understood that everything exhibited must possess some feature of novelty, and it is equally well recognised that one cannot invent photographic appliances every day; but when we consider the number of applications for patents for novelties that are made each week, we would have thought that an opportunity like this would be gladly embraced in order that such inventions should be displayed.

Of those inventions and improvements which find a place in the present Exhibition, we give the first mention to the exhibits of a case of "Cooke" lenses, made by Taylor, Taylor, & Hobson, which has secured for this firm the only medal awarded in this section. As a fortnight only has elapsed since we published a description of this, the latest outcome of Mr. Dennis Taylor's inventive powers, we abstain from giving any further descriptive notice, merely observing that we are gratified at finding our estimation of the lens so substantially confirmed by the award of the Jurors.

J. H. Dallmeyer, Limited, show lenses made on a suggestion by Mr. Bergheim. They are intended for large portraits, in which critical sharpness is not required. Burchett's colour screen, a combination of yellow and green glass, is also exhibited, together with a new form of unsymmetrical negative objective, designed to give a flat field with moderate magnification.

Adams & Co. are, numerically, the most extensive exhibitors. The following comprise their varied exhibits:—The 1896 Pattern Adams Camera, quarter-plate, with Goerz lens. Shutter opening lengthways of the plate, and remaining fully open for a greater portion of the exposure; rapid opening and closing action.—The 1896 Pattern Adams Camera, half-plate, with Goerz lens.—The 1896 Pattern Ideal Camera. A simplified form; the front does not shut up as in the ordinary patterns.—Adjustable aluminium shutter. The lens is not uncovered in setting the shutter.—Bright view-finders, in aluminium, for field and hand cameras.—Augmentagraph Lens, to obtain portraits up to life size in all studios without using an extra long-focus camera, consisting of a portrait lens with a complementary one attached behind it.—Vesta Camera, with Goerz lens

and changing box. Arrangement of Goerz lens with focussing tube in combination with specially small camera.—Half-plate Changing box for hand cameras. Simple form, taking twelve plates or twenty-four films.—Film Dishes, quarter-plate and 5×4, for developing several films at once. Clips permitting of examination of films without handling.—Adams' Enlarging Camera, with movable front and swing back. The back portion may be used as a studio camera.—New Christmas Mounts.

Watson & Sons exhibit The 1895 Pattern Acme Camera, whole-plate, with aluminium mountings. New shape bellows, allowing very great rise of front, and permitting use of very wide-angle lenses; spiral rack and twisted pinion giving perfection of motion to extending base.—Alpha Camera, quarter-plate, with double extending base, double action front (rising and sliding), and swinging back.—The 1895 Pattern Double Camera, half-plate; and a Studio Shutter.

The exhibit of R. & J. Beck, Limited, comprise Frena Film-holders, a Skate Blade Print Trimmer, a Double Roller Squeegee, and a Perfection Flash Lamp.

T. C. Hepworth shows a Hand-feed Electric Arc Lamp for optical lanterns.

A model of the Picket Changing Box for using cut films without notching or other preparation, is exhibited by W. R. Baker.

G. Davenport contributes various ingenious appliances in connexion with Arc Lamps and Lanterns.

Penrose & Co. show a Dark Slide for the half-tone process, designed by Max Levy.

G. Houghton & Son—Sanderson's Swing-front Camera, a Walking-stick Stand and an Orthomograph Lens.

The Lothian Stereoscope (A. H. Baird) and a Flexible Rising and Falling Front Camera (James Cole) complete the exhibition of apparatus, most of which have already been described with considerable fulness quite lately in our pages.

PHOTOGRAPHS FOR BOOK ILLUSTRATIONS.

II.

In a previous article I referred to the difficulty in many instances of being able to introduce figures of workmen into the pictures that were required for advertising purposes. In nearly all large factories or works it will be found that such are now lighted by electricity, and the installation of such is generally under the charge of some competent machinist or electrician, who has the power of rendering considerable assistance to any photographer in the way of overcoming numerous difficulties when dealing with badly lighted corners or out-of-the-way places in which there may be situated some special machine that it is desired to include in the view.

So far as my experience has gone, I have found that the incandescent light is more generally adopted than the arc, but in all works of importance the electrician will have a set or two of the latter lamps at command which he will be able to fix up on very short notice in any place where it is desired that more light be thrown.

These movable arc lamps are very convenient indeed, for they can be hung up on any suitable support in the rear of, or to the sides of the camera, and can be moved about at will, and there is no doubt that, with their aid, many an otherwise impossible subject is secured. I have always found that the best results are got when the lights have been shielded with a ground-glass globe, and, speaking generally, they are best placed at a somewhat high elevation.

Some idea of the time of exposure required when using such in places where no daylight enters may be of interest to the readers of The British Journal of Photography.

In the case of an engine-room, forty feet by twenty, when using two powerful arc lights placed high up, one on each side of the camera, so that just a trifle more light was thrown from one side than the other to give some shade on the subject, and when using a lightning Cadett plate well backed with bitumen and chloroform, I found I had to give forty minutes' exposure, with the lens stopped down to *f*-40. The advantage of placing the lights high up lies in being able thereby to distribute the light well forward. The amount of detail secured in the darkest corners is wonderful, and up to the distance of forty feet there seems to be little or no falling away in the power of the light; beyond that distance, however, the light rapidly fails, and, when deeper subjects have to be dealt with, then an extra battery of arc lamps requires to be placed in front, and so shielded from the lens that the direct light does not fall on the sensitive plate.

Fixed incandescent lamps are sometimes of service and sometimes a nuisance; when they are found to intrude in a picture by throwing their glare right into the lens, they can be unscrewed, and only the globe left on. I have but seldom found much good in using them. The arc light is *par excellence* the light for photographic purposes, and not only can it be used to secure places that have no daylight entering, but the ease with which it can be employed in conjunction with daylight render it doubly serviceable.

Not the least trying kind of subjects to deal with in work of this kind are those where some machine occupies a position in the foreground, whilst such is backed up with a long row of windows that occupy a position right in front of the lens, the effect of which is to throw the fore part of the machine in deep shade; here, again, the arc lamps come in and render great service, for they can be so placed as to concentrate a full flood of light just where it is most required.

Working directly opposite a window should always be avoided if possible, and I now prefer to use the arc lamps after dark on such subjects of this kind that will permit of being so dealt with.

A long row of windows on either side of a workroom seldom gives any trouble, for the camera can be so placed as to avoid the direct light from such entering the lens, and views taken when the light is streaming softly from them, make very effective pictures when properly treated.

As a general rule, sunlight should be avoided for all interior working. The best light is bright, diffused daylight, and when any interior is lighted up on a day when white fleecy clouds are just obscuring the sun, the eye will detect a marked difference in the evenness of the illumination of any room as against the hard, crude lighting of such when the sun's rays are streaming in through the windows. In the one case, there will be detail visible to the eye that is not perceivable when strong sunlight is flooding only a portion of the view, and throwing all the rest into deep shadow.

Another item of considerable importance is the disposition of numerous articles used for trade purposes, or, it may be, they are fixtures, the removal of which would entail a considerable amount of trouble, but the inclusion of which, in some particular view, would go far to spoil an otherwise good effect. Employers and workmen, as a general rule, look upon such in quite a different light from a photographer, and it is well, whenever it is possible, to give effect to the old maxim, that "he who pays the fiddler chooses the tune;" otherwise no result, however good, will give satisfaction that does not, in some degree, give effect to such little weaknesses on the part of those interested, even although such do not coincide with a photographer's idea of composition. In fact, speaking generally, when undertaking work of this kind, the idea of composing a picture must, to a very great extent, be abandoned, the limit generally being to the extent of removing some objectionable object in the immediate foreground. and which, when using wide-angle lenses, would be sure, more or less, to yield distortion, and, if figures have to be introduced, let them be placed as far forward as possible, and in the most suitable light.

In instances where long and narrow workshops have to be dealt with, much of the success will depend upon the selection of the best point of sight for the camera; in such subjects the benches will nearly always be found to be strewn with tools, and other fittings, which, when viewed from a low standpoint, will give the appearance of a general "jumble up." The distinguishing of any particular article in the photograph being a matter of some difficulty, on this account it is therefore, in my opinion, much to be preferred that the camera be placed at a sufficiently high standpoint to allow, as it were, something of a bird's-eye view of the same; by this means many little items of interest, to workmen and employers alike, are brought more prominently out in the finished picture than would be the case were the camera set up at a lower elevation.

There is no need for any special tripod in instances of this kind, there is always plenty of material to be found at hand in large works to support a camera on, and at times even a spiral staircase may be made to do duty as a tripod, in fact, there is no end to the contrivances that may not be taken advantage of.

In all large factories it will be found, during working hours, that a very considerable amount of vibration will be observable in the various flats where heavy machinery is in motion, so that advantage must be taken of photographing such places during the absence of the workers at their meals, or at such other times when the machinery is not in motion; this often reduces a photographer to the production of one single negative during the day. In cases where long exposures have to be given, it is useless to endeavour to rush such work through in any limit of time, and this point should be borne in mind when a professional is giving his quotation for the cost of the

photographs. A large margin of time should be calculated upon, otherwise a pecuniary loss is sure to follow; in this respect such work is quite different from almost any other branch of photography, where an operator can calculate pretty nearly the time that would be taken to accomplish the work. T. N. ARMSTRONG.

METHODS OF STRIPPING GELATINE NEGATIVES.

[Wilson's Magazine.]

As a general thing the American worker who requires reversed negatives for process work, carbon printing, or other purposes, will find the stripping plates in the market the most convenient and economical means to reach the end in view. It is desirable, however, to know the various methods by which the film obtained on an ordinary dry plate may be reversed. The subjoined account of the methods in use, given by Mons. A. Berthier in the *Photo-Gazette*, is commended as giving details of the special advantages and disadvantages of the methods reviewed :—

1. *Stripping with Fluorhydric Acid.*—This method, probably one of the most popular in use, rests upon the use of a diluted solution of fluorhydric acid. The plate is first coated with a collodion, giving a tough and horny film ; as soon as the latter is set it is immersed in the following mixture :—

Fluorhydric acid	1 part.
Water	10 parts.
Alcohol	10 ,,

In a few minutes the film will rise at its edges, and may be carefully drawn off with tweezers. The film is then washed in clean water, to which a few drops of ammonia have been added. It gives good results, but the peculiarly corrosive properties of the acid render the manipulation disagreeable and somewhat dangerous. As fluorhydric acid attacks even glass, it must be kept in rather costly recipients of rubber. Care should be taken to avoid touching the fingers with it.

2. *Stripping with Hydrochloric Acid.*—This process, warmly recommended in *Apollo*, of January, 1895, seems, in fact, to offer numerous advantages over the preceding one. Of the one part, hydrochloric acid is a very common substance, not expensive, not dangerous to handle, provided some precautions are taken; of the other part, its action is somewhat rapid, since a solution of 1 part of acid and 7 parts of water determines the raising of the film in less than two minutes. Here is the manner of operating so as not to injure the image.

The negative, which should not have been varnished, or, if it were, which should have been freed from the varnish by a suitable washing in alcohol, is placed in a porcelain or glass dish. Into this dish is poured a diluted solution of hydrochloric acid—15 parts of acid diluted in 100 parts of water for a half-plate. When the bath has acted for about a minute the edges of the plate are lightly rubbed with the ends of fingers so as to aid the detachment. This last is obtained without difficulty; as soon as the coating has left its support, it is immersed in a clear water to free it from the acid. We then remark that the dimensions of the free pellicle rapidly increase in the two directions. This phenomenon may be utilised for obtaining direct enlargements without the help of the camera. For this purpose, when the pellicle has attained the limit of its increase (that is to say, a few minutes after its immersion in the washing water), it is fixed on a glass plate of the proper size. If it is desirable to obtain perfect adherence between the pellicle and its new support, it will be necessary to previously cover this last with an intermediate coating of gelatine, collodion, or rubber solution. In order to drive away the bubbles which are generally produced between the wet pellicle and its support the whole should be submitted to a slight pressure, after having placed on top of it several sheets of bibulous paper in order to absorb the excess of waier. A rubber or gelatine roller may also be used. To avoid the expansion of the pellicle and consequently enlargement of the image, it should be coated with collodion at 5 per cent. before placing it in the acid bath. In this case the removal will be facilitated by tracing with a penknife a very true frame about a sixteenth of an inch from the edges of the plate.

3. *Stripping with Carbonic Acid.*—M. Liesegang has proposed carbonic acid as a substitute for fluorhydric acid. It is not used in the same way, as might be expected, but it gives with some plates rather good results. The principle of this method is as follows: Plunge the plate in a neutral or acid carbonate (the carbonate of soda is well adapted for the purpose), then, on coming from this bath, immerse it in an acid solution (citric, acetic, &c). The salt is decomposed and the carbonic acid is disengaged in rather large bubbles, which tend to raise the gelatine and separate it from the glass. The operation is continued until the production of the gas has been sufficient to produce the desired result.

4. *Stripping with Fluoride of Sodium.*—Instead of using fluorhydric acid, the objections to which have already been mentioned, its salts may be used, and notably the fluoride of sodium. According to Bolas, it is not necessary that the aqueous solution should have a well-defined composition ; nevertheless, it should not be used too highly concentrated. The gelatine coating is separated in three or four minutes from its support in cases where the negative has *not* been developed with pyrogallic acid, as then the action is much slower.

5. *Stripping with Alum.*—This salt, generally used to harden the gelatine film, may also be used to separate it from the glass, when the action of the solution is sufficiently prolonged. Mr. Jenny has indicated the following bath for this purpose :—

Water	35 ounces.
Alum	2½ ,,
Tannic Acid	½ ounce.

After the plate has remained four or five minutes in this bath it acquires great limpidity, and the film becomes so hard that intensifying is not to be thought of. To obtain the separation, it is necessary to have the bath act for a longer time than for the simple aluming.

6. *Stripping with Hyposulphite of Soda.*—When gelatino-bromide plates are allowed to dry on coming from the fixing bath without washing, and plunged, after drying, in a dish containing ordinary water, it will be observed that the film has a tendency to leave the glass, especially if the drying has been done in a damp place. The separation of the gelatine takes place so easily that it is hardly necessary to wet the coating ; the humidity absorbed by the gelatine, the hygroscopic properties of which are well known, are sufficient to bring about this separation. It is probable that this fact, which every amateur must have sometimes remarked, can receive a practical application. If, as it seems probable, the hyposulphite acts here mechanically by its crystallisation in the coating, there will be advantage in using a concentrated solution of 1 part hypo-soda to 4 parts water. The plate should be allowed to remain for a few minutes; for a negative that has not been fixed the operation should be prolonged until the complete disappearance of all the bromide of silver in the plate, then the plate should be dried in a damp place without previous washing. Hypo-soda is not the only salt susceptible of producing the result indicated; other substances more or less hygroscopic, used in sufficiently concentrated solution, would, doubtless, be apt to cause the separation of the pellicle from gelatino-bromide of silver plates.

SOME REACTIONS OF FORMALDEHYDE.

[Chemical News.]

FORMALIN (40 per cent. formaldehyde) from Schering, of Berlin, was taken.

Permanganate of potassium immediately reduced. The formaldehyde fully oxidised to CO_2 and water. Ferric chloride solution (hot) is somewhat deepened in colour when formaldehyde is added. On allowing to cool, then reheating and adding a little ammonium hydrate, a bulky red precipitate of basic ferric formate appears.

Ammoniacal silver solution appears to be reduced in two stages, viz. :—

1. $Ag_2O + H.COH = Ag_2 + H.CO_2H$. In this stage the silver falls in the specular form.
2. $Ag_2O + H.CO_2H = Ag_2 + H_2O + CO_2$. In this stage the silver falls in a pulverulent form.

A hot solution of potassium ferricyanide was made ammoniacal and a little formalin and sulphate of copper solution added. A brown precipitate immediately appeared. The same reagents minus the formalin gave a fine green solution. This I regard as evidence of the reduction of ferricyanide to ferrocyanide.

Hot Fehling's solution is rapidly reduced by formaldehyde.

Ammoniacal copper sulphate *per se* is not reduced. Mercuric chloride is not reduced.

Alkaline mercuro-potassium iodide is immediately reduced to metal in the cold. T. H. LEE.

BACTERIA IN GELATINE.

[Journal of the Photographic Society of India.]

THERE is perhaps nothing in the whole range of difficulties one encounters in India so aggravating as plates and paper ruined in the rains. The visible injury is due for the most part to the influence of low forms of plant life, but bacteria also may find in the gelatine support of the film a happy cultivating ground. The emulsion inoculated at some part of the spreading processes with these micro-organisms would then only need

the required moisture and heat to develop with their well-known rapidity. The impregnation might take place in various ways, through the water used for melting the gelatine, the air of the factory, or through the utensils and appurtenances used in coating the support. Such organisms ie inert in the low temperatures of England, and in the cold weather of he higher latitudes out here are not likely to cause trouble. But no sooner does March with its fierce sun begin to influence us to hang our punkahs than the wily microbe may also begin to stir. If to this increasing temperature is added damp, we have in these two stimulants the perfect conditions required to develop, not only bacteria within the film but a fungus bed on its surface; and there is no doubt as regards the lower forms of plant life that they respond and proceed to multiply with facility on both plates and papers.

In some experiments I made some time ago with plates covered with fine flourishing crops of these organisms it was found that even prolonged exposure produced only mottled and measly-looking negatives through which the picture struggled indistinctly. One plate from the same box—the half of which had been swabbed with slightly acidulated water and dried before exposure—showed on development a marked improvement on the washed half, and another which I washed vigorously under the rose was very much improved. But mysterious-looking markings, due possibly to cultivations, whatever they were, still remained in the developed image. Unfortunately I have neither the time nor the knowledge to pursue these experiments; but, should this meet the eye of an enthusiastic bacteriologist, allow me to introduce him into what may be an unknown field of photographic research. In countries like England, where the temperatures and hygroscopic conditions of the air range much below that of damp, steamy places like Lower Bengal, the mischief due to fungoid growths on photographic plates and papers is probably too small to be recognisable. But even there how often do we hear and read of complaints of strange mysterious and unexplainable markings, and how keen every worker in photography is to get fresh plates and paper? Staleness may be, and probably is, due to chemical changes in the film, changes unconnected with organisms, but our knowledge of the influence they may exercise in conjunction with, or as a result of, these changes is so limited that the matter is worthy of more investigation than it now receives.

If it were possible to produce sterilised gelatine plates and paper as articles of commerce, may it be suggested that in this direction lies much of the secret for improving their keeping qualities? but, if it is found that bacteria exist, and that it is impossible to prevent the growth of these cultivations in the gelatine film, then in some structureless substance like collodion will probably be found the film of the future. There are workers in this direction now, and it requires much less than the prophetic powers of a Zadkiel to predict that a film will, one day, soon be discovered which shall possess all the virtues of gelatine without its fatal attractions for fungoid growths. These, however, are conjectures and hints for the future. The practical photographer has at present to work with gelatine-coated surfaces, and the question in the plains, especially in the rains, is how to keep one's stock of plates and paper in good workable condition.

"THE LAY FIGURE" AND PHOTOGRAPHY.

THE Lay Figure, who had been gazing out of window for some time at a man with a camera, suddenly said, "Is that your rival or your future conqueror?"

"I do not fear the photographer," said the man with a clay pipe, "not even the more modern type who arrogates to himself the title of artist. He is often an artist within certain limits, and his share in the education of the people is far greater than you fellows give him credit for."

"Considering he is crowding us out of nearly all the magazines," said an illustrator, "I don't think we feel disposed to call him an artist as well as a successful enemy."

"Nonsense," said the man with a clay pipe; "sheer nonsense! The railways have not destroyed the breed of horses—the photographer has not banished even the common or garden portrait painter, much less the purely creative artist. Don't you see that all that tends to raise the taste of the public makes for art?"

"Yes, that is very well," said the illustrator; "and so you find posed models in costume figuring as full pages in the weekly papers."

"Instead of the foreign *cliché* of a few years ago," said the man with a clay pipe. "Is it folly to prefer good Nature to debased art?"

"Look what it has done for topographical pictures," said the Lay Figure; "for portraits of ephemeral celebrities, for records of sport, and for 'event work' generally. Just turn up a file of the old illustrated papers, and study the average horrors of their padding."

"That is so, no doubt," said the man with a clay pipe. "I am as jealous of the true artist as you could be. Whether he be poet, composer painter, or illustrator, he is of the world's aristocracy; and no matter how democratic ideas prevail that must always be recognised; but I see no reason to champion the mere artisan in rhyme, melody, or pictures. He may be a worthy person, whose wages help to keep the State going; but, I do not see why he is to be called an artist and protected by sumptuary laws against the wielder of the camera, who is certainly as much an artist as the merely uninspired rhymer or painter."

"That is quibbling," said the illustrator. "The draughtsman selects and interprets; the camera is a mere machine to record facts."

"I don't own even that; but who selects the facts to record?" said the man with a clay pipe. "Selection is not in itself art. I grant you that perfect selection is the highest achievement of art; but I prefer the selection of a perfect subject by the photographer to the ill-selected bundle of worthless facts of the journeyman illustrator."

"You hold the brief for a camera, evidently," said the illustrator; "and yet you, of us all, can easiest dispense with its assistance. It is just one of your subtle absurdities you call paradoxes."

"I don't dispense with him," said the man with a clay pipe. "I do not take prints and trace the outlines, nor do I copy them in paint; but the truth they show me, mixed as they are with imperfect renderings of things seen, are profoundly interesting. The camera records with the keen observation of a trained eye, even if it has not the power to pick and choose like the same eye directed by a fine sense of appreciation."

"And yet you say photographs always distort facts," said the illustrator.

"I might have said so," the man with the clay pipe replied, "but Heaven forgive me if I betrayed my opinion of the average painter's fidelity to Nature. The point is this—the photograph speaks to the people. It is the common language of all nations; and its lessons have already shattered many a foolish convention of the past."

"And yet you admire Mr. Whistler's work, or say you do," said the illustrator; "you profess to adore Velasquez and Titian, to delight in Dürer and Rembrandt. What would all these men have said to the photograph?"

"In haste, something uncomplimentary perhaps, but at leisure much what I do," he replied.

"But what is its value?" said the illustrator.

"In teaching people to believe that natural compositions are no less beautiful than artificial arrangements, in showing the irresistible truth of certain organic facts, in accustoming the eye to proportion, which, if not ideally correct, are vastly more so than those the inept draughtsman is able to portray, and in preserving mementoes of fleeting effect—of movement, of light, and of passing phenomena, that would otherwise escape record." The man with a clay pipe stopped a minute, and added: "When the photograph is true it is a most helpful ally to art, even when it fails it is no traitor; and despite the commercial aspect of the case, that which kills off the incompetent and the charlatan is no enemy. It may be hard for the individual; but, if a man be not strong enough to withstand the opposition of the camera, let him drop his pencil or his palette and couch beneath the dusky tripod, using his wits as well as he may, as a vassal."

THE LAY FIGURE IN THE *Studio*.

ROYAL CORNWALL POLYTECHNIC EXHIBITION.

PHOTOGRAPHIC DEPARTMENT.

THE Judges in the Photographic Department are pleased to congratulate the Society on the high quality of the exhibits, and the display is above the average of former years. From year to year we note a variation in the different classes; this year, in the Professional Section, portraiture is represented by gentlemen of the highest talent in the kingdom, which their exhibits testify. There is a general falling off in professional landscapes, but other classes are well represented. In the Amateur Section portraiture stands well this year, and is of a very high standard of excellence, which is rather unusual for amateurs. Instantaneous, including hand camera work, has special merit. The Landscape Class is very good indeed. In the Appliance Section is the electric arc lamp, adapted to the optical lantern, which gives a perfectly pure and steady white light.

PROFESSIONAL SECTION.

Messrs. J. Chaffin & Son, of Taunton, send a fine collection of figure studies and *genre* pictures; No. 585, *Tiddley Wink* (a very happy composition) receives a first silver medal. Mr. J. H. Gear, of London, receives hon. men. for his interior, *Behind the Reredos, Winchester Cathedral*. Mr. J. H. Coath, of Liskeard, is represented by a large series of figure and animal studies, and also some still-life subjects; No. 593, an amusing series of cats, takes a first bronze medal, and to No. 610 hon. men. has been recorded. Mr. T. Protheroe is represented by some very good enlargements. Mr. J. Smith sends a frame of examples of *The Golden Valleys of England*. Mr. W. Morris shows two frames of *Geological Formation*, worth careful study, and they take a first bronze medal. *Birds' Nests*, by the same exhibitor, show careful work. Mr. W. Butcher contributes some good work. Mr. P. Lancaster takes first bronze medal for a female figure, *A Greek Study* in sepia, which is very effective.

Mr. F. Marsh sends some good examples of home studies, taken by magnesium light, the results being perfect, and takes first bronze medal. Mr. W. H. Harrison, of Falmouth, sends some very good bromide enlargements, local views and portraits. Mr. R. S. Webster sends two very careful portrait studies, which are artistically rendered. Mr. C. M. Wane, of Edinburgh, sends several frames of his productions. Mr. J. C. Burrow, of Camborne, has been awarded a first silver medal for his meritorious production, *At Humanity's Call*, being the wreck of the *Escurial* at Portreath; for reality it is one of the most effective pictures that has ever adorned the walls of the Society, and is untouched, and is truly an artistic picture. Mr. H. S. Brightman sends some charming architectural work; No. 648, *Porch of St. Stephen's Church, Bristol*, carries off a first bronze medal; the others are of almost equal merit. Mr. R. M. Evans contributes several frames of good work. Mr. H. J. Godbold, of Hastings, for his portrait study, No. 657, has been awarded a first prize medal. Mr. H. Spink contributes several frames of portrait studies. The Autotype Company, of London, send a large collection of their well-known reproductions: carbon enlargements, collotype, photogravure, and examples printed on satin; No. 670, *Holland House*, an enlargement of very high order, takes a first bronze medal. Mr. Gambier Bolton, of London, sends a fine collection of his well-known animal studies, which are so well known and need no further comment, they are marked not for competition. Mr. G. Jobson sends six examples of artistic posing. Mr. S. N. Bhedwar, of Bombay, is represented by a series of pictures of Parsee priestcraft, which are highly interesting. Mr. Arthur Jane, of Bodmin, sends a panoramic picture of Bodmintown, taken in sections, he also sends several other frames. Mr. F. Marsh also shows a frame of enamels, by the wet-collodion and substitution process, which would have been better had they been a little warmer in tone. Mr. W. J. Byrne, of Richmond, is again well to the front with large direct portraiture of the highest possible order; No. 715, *Dr. Bennett*, takes first silver medal; the same artist also shows several frames of portrait studies of ladies and children printed in red chalk, and are well worth careful attention. Mr. G. Lafayette, of Glasgow, is also well in the running with portraiture, and takes second silver medal for a portrait study of *Professor Story*. Mr. R. T. Ford sends a very good picture, *An Exciting Race*.

Amateur Section.

Mr. S. L. Coulthurst contributes twelve hand camera pictures illustrating street life, which they do thoroughly—a second bronze medal has been awarded. Mr. G. Hepworth receives honourable mention for his contributions in architectural work. Mr. E. Dudley shows some very good work. Mr. E. Griffith sends a picture of *The Garden of Gethsemane, Jerusalem*. Annie Blamey sends examples of careful work. The Rev. H. B. Hare sends four pictures of Somersetshire scenery, which show great taste both in selection and manipulation. No. 794, *Cottage in the Hollow*, takes a first bronze medal. No. 795 is a curious picture for photography. It is a ruined mill with its crumbling walls, and, if it is viewed from a distance, a face of a late Cabinet Minister is curiously portrayed, it is named *A Natural Puzzle Picture*. The Rev. C. V. Keene, of Falmouth, sends a frame of instantaneous studies, which are as perfect as possible, and have been awarded first bronze medal; the Judges are pleased to note the marked improvement this gentleman has made since last year. Mr. J. A. Boolds sends some half a dozen enlargements which are very poor in quality. S. Beare, of Penzance, shows twelve hand-camera pictures, which are soft and delicate. Mr. A. R. F. Evershed sends a series of very small pictures which show great artistic taste, but to the mind of the Judges they are too small for exhibition purposes, and they would like to see some larger work. Mr. H. Tonkin, of Penzance, contributes a number of pictures of half-plate size of good quality. Mr. W. S. Aston sends a large collection of very high-class work—No. 824, *A Crimean Veteran*, being a study of a head; it is a fine example of photography and receives a second silver medal, and the other works by the same gentleman are well worth very careful inspection. Mr. Court Cole, of Oxford, shows three examples of his work, No. 830, an interior of one of the college chapels of Oxford, a first bronze medal. Mr. A. Fellowes exhibits some careful work. Mr. H. A. Millen is represented by a series which are very poor in quality. Mr. E. C. Hertslet has several frames showing work of good quality. Mr. W. Dodson also shows some good work. Mr. A. Stieglitz shows some artistic productions of good quality. Mr. H. R. Barnet, first bronze medal for *Study of Head*, taken direct (No. 841).

Photographic Appliance Section.

Mr. G. Davenport, of the Society of Arts, John Street, Adelphi, London, shows a most perfect arrangement of the Electric arc lamp, adapted and fitted to the optical lantern, giving the most perfect result, and a resistance coil to use with the same. The lamp gives a perfectly pure white light. To this lamp and arrangement a first silver medal has been awarded. The same gentleman shows two very clever lantern-slide carriers with curtains, these receive honorary mention. Mr. Joseph Smith sends a so-called improved vignetting frame, or disc; the Judges fail to see where the improvement comes in.

EDINBURGH PHOTOGRAPHIC CHEMISTS AND THE POISONS ACT.

The *Edinburgh Evening Dispatch* says: "It is the inherent vice of all legalised monopolies to endeavour illegally to extend the boundaries of their territory and control. They are perpetually forgetting that the legal limit is meant to be a limit from within as well as from without; and that indeed it is a more serious and heinous offence for a privileged corporation to invade the common liberties of the citizens than for any individual citizen to encroach on the privileges of the corporation. The corporation enjoys its privileges in the interest ultimately of the common weal, and not for the sake of aggrandising or enriching itself. The very possession of special privileges has unfortunately a tendency to enrich and aggrandise it; and with increase of wealth and power comes the inevitable temptation to be selfish and tyrannical in the use of both. The Pharmaceutical Society has just furnished a new example of this general thesis. By the Pharmacy Act the pharmaceutical chemist has a monopoly of a very lucrative branch of trade. The basis of his monopoly does not lie in the materials with which he deals, but in the fact that, in virtue of special knowledge, he is capable of turning them to special account in the service of the public. He alone has the right to keep open shop for 'employing the methods by which drugs are prepared and combined for administration' (to use Dr. Lauder Brunton's definition of pharmacy). But this does not give him any exclusive right to deal in the raw materials out of which his drugs are prepared and combined. He uses iron for the preparation, say, of Blaud's pills; but that does not give him a right to interfere with the ironmonger or the ink-manufacturer. He extracts some of the most deadly of his drugs from some of the commonest of garden flowers; but, though the poison is present in fatal quantities in the growing plants, he has no right to interfere with the trade of the florist or the gardener. In the same way, though the photographer or the purveyor of *materia photographica* may deal with many of the preparations which are included in the *materia medica*, our privileged pharmaceut has no right to interfere with purveyor or photographer. Nor does our privileged pharmaceut enjoy his privileges in virtue of a knowledge of chemistry. The unfortunate lingual laziness of the common folks, and the unfortunate length of the vocables which the pharmaceutical chemist (twenty-one letters in all) has chosen for his designation, has led to his being popularly and phonetically known as the kemmist, the kimmist, or the kammist. But this accident of language (which would never have happened if our pridefu' P. C. had stuck to the good old name of 'pothecary) does not make our pharmacist the only man entitled to call himself 'chemist.' To infringe his privileges, a man must claim to be a 'chemist within the meaning of the Act;' and the meaning of the Act ought surely to be interpreted in accordance with the characteristic title by which the Act is known. The lawyer, indeed, may at times, by technicalities of legal phrase, be obliged to give a decision out of harmony with the common sense and the obvious equity of the case; but the Pharmaceutical Society will best consult its own ultimate interests, as well as the interests of the public, by taking no needless advantage of such technicalities of phrase. Our ceuticals (they may prefer this to the old word apothecaries, and it would be less misleading than 'chemists') are on the eve, if they work wisely, of becoming a 'Profession' instead of a privileged conglomeration of shopkeepers; but, if they wish to become a 'Profession,' they must keep strictly to the scientific limits of their calling, and encroach neither on the province of the physician nor the photographer."

The *Edinburgh Evening News* says: "With the prosecutions by the Pharmaceutical Society of chemical dealers for selling poisons scheduled under the Pharmacy Act the general public will have little sympathy. The action is that of a large medical trades union, desirous not so much of protecting the general public as of protecting trade interests, which in this case conflict with public convenience. Sheriff-Substitute Sym's decision yesterday does not quite clear up the points at issue, but, as an appeal has been taken to the Justiciary Court, we may expect an authoritative finding there. The Sheriff left it open to a dealer to sell poisons to those who use them in the ordinary course of their business. The question is whether the amateur scientist can purchase from the dealer or whether he must go to the ordinary chemist, on the ground that he is not buying for profit but simply for personal use. If the law is not clear on the point, it should be made so. The Legislature never intended to confine the sale of poisonous chemicals to a trades union, but only to prohibit the indiscriminate sale of poisons to the general public. As it is, only a very few of the many poisonous chemicals sold by scientific dealers come within the scope of the Act. Poisons quite as virulent as those scheduled are not taken cognisance of by the law. Consequently, it is absurd that restrictions such as those the Pharmaceutical Society seeks to impose should be enforced."

METHOD IN PHOTOGRAPHY.

[Photographers' Association of Ohio.]

There is no vocation under the sun wherein system is such a necessary factor as it is in photography. The very art is based on chemistry, which is a science of fixed laws. Allied to this we have all the details of a com-

mercial venture, which must be conducted upon strict principles in order to attain its proper aim. As a counterfoil to these, we have the artistic end of the line, which is an enemy of both the others, for the artist is ever a dreamer, either too good for this earth if his art has demoralised him, or too far above it, if the art within him is really true, for him to descend to the plane of his fellow-men. With these conflicting points I shall not deal, but rather confine myself to the subject of method in the business, and, by presenting certain facts, bring about a realisation of the importance of conducting every branch of it upon a systematic basis. If there is any one thing more than another that the public is interested in, it is a pretty picture. Hence the first aim of every photographer should be to use method in the display at the entrance to his gallery, changing it frequently, and placing his very best work where it will catch the eyes of the passer-by. No one can estimate the trade that such exhibits would ultimately bring in, or how many vacillating souls might be converted thereby. Yet, in the face of such sound argument, have I frequently seen prints so yellow that they might be used as a substitute for saffron in a dye-house. Once before I alluded to this same subject, and a very estimable gentleman, whose friendship I value very highly, saw me enter his gallery shortly afterwards, and at once exclaimed: "I suppose you noticed my show-case as you came upstairs, and saw the prints were not changed. Really I meant to have them changed the very next day, but business prevented!" Had I spoken out what I thought, I might have asked if that exhibit had not prevented business, but I didn't have the heart to say it. The best way to keep customers away from a gallery is to have a dirty entrance. I really never could understand why the average photographer uses so little method in his cleanliness, with stairs that have not seen soap and water for months, grimy side walls that even an Indian would be afraid to touch. It is no wonder that the people draw the line between such places and the ones that are conducted properly. When I see a neat show-case and a clean entrance, I know what to expect when I get upstairs, and I am very seldom disappointed. There will be nicely framed pictures on the walls, the curtains will be white, the windows clean, the show-case polished. There will be no holes in the carpet for you to stumble over, or, if there are, a nice rug will cover all that, and at a small expense too. When I strike the reverse, I always expect to find a room with a big piece knocked out of the ceiling, or else the proprietor either wearing a soiled collar, or else in possession of a pair of pyro-stained hands that must offer a very pretty contrast to the pictures he hands out to his lady customers! First impressions are very apt to be lasting ones, and hence I cannot too strongly emphasise this point of cleanliness in the reception room, for it is an index to the whole establishment. I never saw a photographer yet who would not almost faint if he had his dinner served upon an unwashed breakfast plate. And yet there are hundreds of galleries throughout the land to-day which have been presenting for years the same dirty floors, mouldy walls, and dust-stained ceilings, while their owners are wondering why the public are no longer interested in them. Were I conducting a gallery, it would be so clean that I could and would escort favoured customers through it, and thus utilise it, not only as a place of business, but as an educator as well. Method in the treatment of customers is also of the utmost importance in every gallery. It does not do to discriminate in a crowd, and make the man you salute with "Hello, Bill!" feel as if he was a welcome guest, while the stranger receives the punctilious bow and the cut-and-dried, "What can I do for you, sir?" It is, of course, not every day that one gets a crowd in these times, but "golden days are approaching," to quote the words of a very good friend of mine.

To revert, true courtesy will always receive its reward, and ladies ever demand and are entitled to respect and attention. We all know of the little lock of hair that always shows in the wrong place and makes a re-sitting necessary. It is useless to fight against that little lock of hair and tell the sitter that it was there when the picture was taken, which it really was. Better make one negative over again than lose, perhaps, two new customers that a single satisfied one would bring.

There are so many methods used in the conduct of our business, and of so many divers aims and tendencies, that they are sufficient for an article in themselves. Flattery, that most insidious of all persuaders, plays a most unimportant part in the game, and can truthfully be proclaimed as the most hazardous ground ever trodden by any photographer. Ill temper will drive away more customers than anything else, while broken promises mean sure death. To succeed, one must ever strive to win the confidence of his patrons, precisely the same as any good business firm holds its trade. Thus, I've always wondered what a certain photographer was going to do to extricate himself when a little girl entered that gallery while I was there, and, returning a proof, said: "Mamma says the likeness is very good, but when you make the pictures please have the face turned the other way!" The man said he would, and he lives in my own State, too!

Under the skylight it is very necessary to be so pleasant that every sitter will feel at home at once. You cannot make good pictures of people who look dissatisfied, frightened, or constrained. In an old gallery I once saw the photographer conduct a stout old lady into the operating room, bid her be seated, and then make a wild lunge for her with both hands just as she was about to sit down. I thought for the moment that the man was actuated by a sudden frenzy of love for the stout old lady. The next second I heard him say: "I beg your pardon; I forgot to tell you that one of the legs of that chair is split, and you must be careful when you sit down!" And she was careful, I can assure you; but I have always been anxious to see a finished picture of her in order that I might note her expression. As a foil to this, I leave to your imagination the expression on the face of a prominent Indiana photographer, who had succeeded, after a deal of persuasion, in getting a certain Hebrew merchant to have a combination picture made of his little boy. He was just emerging from the dark room with his plate-holder when he overheard the old man say to his son: "For the love o' God, Ikey, don't move! Dose pictures cost your fader $9 a dozen! Stand still, my child; stand still!" The boy never moved, and that picture certainly was a success.

The operating room should always have enough in it to make it attractive. A few framed prints, a large plant or two that certainly would flourish there almost unheeded, a few odd rugs and comfortable chairs, would add an artistic air of refinement that could not but be appreciated by the stranger and commented upon afterwards as a most desirable innovation. The day is passed when a photographer can excite astonishment and win his reputation by tumbling down a soap box throwing a mouldy tarpaulin over it and placing the innocent child therein, produce a picture of papa's first and best, seated on a real rock. In plain English, make away with the trash that defiles so many galleries and is such an eyesore to every one who gazes upon these prehistoric relics. Burn them, cut them up, do what you will, only get rid of them.

WILLIAM F. MILLER.

(To be continued.)

THE "DAILY CHRONICLE'S" ATTACK OF PHOTOGRAPHIC HYSTERICS.

OUR contemporary on Thursday, September 26, had the following article on the Salon:—

"THE PHOTOGRAPHIC ARTIST AND HIS SALON.

Between art and photography there is a great gulf fixed. But you open a Photographic Salon, and form a Linked Ring, and the gulf is bridged at once. We seem to remember, however, something about a certain bridge in Euclid, and also a legend about certain clever people rushing in where angels stand from under. Photography, however, was not invented until yesterday, when these sayings were old and trite. The gentlemen who compose the Photographic Salon announce, in their Foreword, that they have put off the old photograph, and the "new photography, with its fresh aims and modern methods," is their game. Comparisons, we know, are odious, but these things rather seem reminiscent of the new woman and the degenerate days of the *Yellow Book*. The new photography is "a craft of almost unlimited adaptability, used by those who have that peculiar combination of taste and imagination which we call artistic feeling," or so say the exhibitors. And yet to-day a photographic paper falls into our hands, in which we read, "It is owing to a recognition of the fact that even the duffer may, by sheer chance, do an admirable thing in the photographic way . . . . that the veriest beginner will stand an almost equal chance with the most experienced professional." These are not our sentiments, but those of the new photographer. He not only believes that he is artistic, but he is cocksure of the fact that there is no other art in the world but his own. The case is not without its parallel. The machine which turns out the useful margarine, no doubt, is certain that it fills a much higher mission than the harmful, unnecessary cow. We must point out that the Photographic Salon has just the same relation to the artistic Salon—by the way, the name is rather synonymous with old and hackneyed ideas—that margarine bears to butter. These new photographers are not content to be photographers, they must be real artists, even if they have to forego all knowledge of drawing, of composition, of light and shade, of selection, of arrangement. What does it matter? At the psychological moment, do they not put their head in the black bag and pull the string? Luck, chance, or some other fellow, does the rest.

Still, among the exhibitors at the Dudley Gallery there are three or four men whose works demand respectful attention. Curiously enough, they are either professional photographers or professional artists; they were invented long before the new photograph or the new woman, and it

is a wonder to us how they find themselves in such a gallery. Mr. Hay Cameron, who comes of a family of photographers, deserves special praise for his excellent head of Mr. Pope, Q.C. But better work still is shown by Mr. Frederick Hollyer, to our mind the most distinguished photographer in England, in his very striking portrait of Mr. Ruskin. Dignified in pose, simple and direct in light and shade, it is a record of the Sage of Coniston which, we have no doubt, many people will be glad to possess. The portrait of Bernard Evans, also by Mr. Hollyer, shows plainly that, when a man has associated all his life with artists, he will use photography to the best advantage. The third photographer, who, with the other two, is distinctly upon a higher level than the rest of the exhibitors, is Mr. J. Craig Annan, who may be called the photographic member of the Glasgow school. Possibly Mr. Annan has been just too much influenced by the art with which he is surrounded. For example, his *Lady in Brown* would certainly never have been done but for Mr. Whistler's *Fur Jacket*. Several of his other portraits are far more individual, if we except his *Mr. Guthrie*, in which his attempt to get life and atmosphere has only resulted in a blur which makes our head ache. But his most interesting contribution is called *The Dark Mountains* (No. 170). In this some figures traversing a high pass have been caught by a snap-shot against a brilliant sky, seen above distant peaks. The result is one of those happy flukes which make us feel how much better a painter would have rendered the same subject—and this, we imagine, Mr. Annan would be one of the first to admit. He has recorded, in his portraits and in his landscapes, interesting facts which would make artistic pictures. He has not attempted to make pictures out of photographs. That a simple statement of fact may be charming and suggestive is very well demonstrated by Mrs. Carine Cadby in her studies of vine leaves and dock. These, and one or two heads by Mr. Will A. Cadby, and an afternoon effect in the Brompton-road by Mr. Eustace Calland, seem to us almost the only remaining contributions to the Exhibition in which the photographers reveal any intelligent understanding of their mechanical medium.

On the other hand, we have painful imitations of mezzotint, which could deceive nobody but a photographer. We have pitiful nocturnes, which exhibit conspicuously the fact that their makers do not understand that the horizon is a level line, and does not tilt down to one side; we have effects of electric light, which show a woeful ignorance on the part of the self-styled artist and the electric light maker of arrangement and composition; we have impressions of sun seen through fog by means of scratching out and piled-up Chinese white; we have pure cribs from M. Zorn and other *pleinairistes*, and even M. Bonnat has been made use of; and we have many other things which may be magnificent, but are not art."

And this on Tuesday last on the Royal Photographic Society's Exhibition:—

"Yet More Photographs.

It never rains but it pours. At least, this is the state of the weather photographically, if not meteorologically. We were going to say that no sooner had we finished with the Photographic Salon in the Dudley Gallery than the Royal Photographic Society opened an Exhibition in Pall Mall East. But, from the number of communications we have received concerning the Photographic Salon, we imagine that we have not quite finished with it. The members of the 'Linked Ring' seem to think that we wish to suppress them altogether; at any rate, that we have no desire to see any more of their work. On the contrary, we should like to see much more of it; we should like to afford them all the encouragement in our power, and the minute that they begin to assert themselves as photographers we will do our best to point out the great merit of their work. But, first, they must give up their talk about being painters and posing as artists. They are neither the one nor the other; they are the most interesting body of photographers at present in existence, and they have simply to take their stand as photographers, and every one will be glad to accept them. How greatly superior the results they obtain are to those turned out by the members of the Royal Photographic Society may be best understood by visiting the rival show.

In the latter, the only work which really interested us was Mr. Hollyer's portrait of himself, together with the prints by Mr. and Mrs. Cadby. Curiously enough, all three of these photographers are exhibitors at the Dudley Gallery. The strength of Mr. Hollyer's work can be judged by comparing it with the portrait by Mr. R. W. Craigie, which hangs next to it. Mr. Craigie's model is much more pictorial than Mr. Hollyer himself, but the result in Mr. Hollyer's hands is decidedly more interesting. There are many good records of facts, though wanting in light and shade, and distorted and exaggerated in perspective, in the work of S. B. Bolas & Co, J. Stuart, and others. But, taken as a whole, the collection is dreary and commonplace. Life is too short to discover the perfect lantern slides when they are exhibited in batches of fifty. We do not profess to find out where the art section comes in. That has, ere this, been solved by Mr. W. L. Wyllie, A.R.A., who, we observe, has been appointed Judge. In the reproductive work, which is always most interesting in this Exhibition, very good effects of printing have been obtained by the Autotope Company; their work is distinctly the best in the show. If the block from *Vanity Fair* was produced by what is known as the three-colour process by the Heliochrome Company, it is the most successful experiment we have yet seen by this unsatisfactory and inartistic method. Mr. E. F. Denison's reproductions of sketches by Sir Thomas Lawrence are remarkably good. But, after all, probably the most notable thing about the Exhibition is the fact that the photographers, to illustrate their catalogue, have had to fall back upon the work of an artist, and the little pen drawings in it are really more vital and personal than almost any of the photographs on the walls."

Our only comment on the above is—!!!!!!!!!!!

Our Editorial Table.

Platinotype.

By Captain W. de W. Abney, C.B, &c., and Lyonel Clark, C.E.

This valuable work, which, albeit small in size, is crowded with sound information relating to platinotype in its historical, theoretical, and practical aspects, is published by Sampson Low, Marston, & Co., Limited, and contains really everything that is required to be known by the worker in platinum, or by the aspirant after knowledge in the working of this increasingly popular and excellent process of photographic printing. All the manipulations requisite for the preparation of the paper, and for developing by either hot or cold bath methods, are here to be found, and we can strongly recommend it. The well-known characters of the authors are a sufficient guarantee of the chemical and manipulative soundness of the work. 174 pages.

News and Notes.

The address of the new Secretary of the Brighton and Sussex Natural History and Philosophical Society (Photographic Section) is 43, Compton-avenue, Brighton.

The prize of 10*l.* and a silver medal for the best Novel Family Album has been awarded to Mr. William Field, photographer, High-street, Putney, London, for a most ingenious and painstaking collection of family relics. Every household ought to start such an album, putting into it portraits of people, birthplaces, documents, and any other matters of interest. It would be a most valuable heirloom. Mr. Field is to be congratulated upon his distinct success.—*Tit Bits.*

The Society of Photo-etchers, 23, Baker-street, London, W. Hon. Secretary, Mr. Arthur Vokins.—This Society is established for the mutual advancement of photo-etching process, and is composed of artists, photographers, and etchers; to hold periodical social meetings and *conversazioni*, to which others conversant with the fine arts, photography, and process printing are invited. At these meetings the opportunity is afforded for inspecting works of art, specimens of process work, machinery, &c., contributed by members, visitors, and others. The Society is limited to 200 members. The meetings take place at the Permanent Gallery, 23, Baker-street, W. Open all the year round. An annual Exhibition of the works of members, and others of paintings, drawings, photography, made for reproduction in any mechanical process for the illustrating of books, periodicals, catalogues, Christmas cards, menus, &c. Annual subscription, 21*s.*, in advance. Ladies eligible.

Hand work on Half-tone Blocks.—The following is an extract from an interview which a representative of the *Publishers' Circular* had with Mr. Wilson, a Managing Director of the Art Supply Company:—"Now, if you will come with me," continued Mr. Wilson, "I have something else to show you." Mr. Wilson then took me into a room where several engravers were at work. "Notice this block," said he. "Here is a proof of an ordinary half-tone reproduction of a drawing by Mr. Bernard Partridge. Now, although this is a finely etched copper block, it has certain faults which have invariably been associated with process work. There is a tendency—it is only a tendency—to reduce all the tones to one uniform grey. The light tones become darker, and the dark tones frequently become lighter. In America, as, no doubt, you know, this tendency in process work has for some years been counteracted by a rather free use of engraving, and we have lately introduced the same method into this country. There is a brilliancy and quality in some of these reproductions," he went on, handing me a batch of proofs, "which can only be attained by engraving. You will see the difference now between ordinary half-tone 'process' and engraved 'process.' This is a proof from the block in its final state, and I think that there can be no higher commendation than Mr. Partridge's opinion that 'it is the finest process block he has ever seen, and quite free from the ordinary faults of process.' I may mention that Mr. T. Walter Wilson considers the reproduction equal to fine engraving. As to the cost, of course, it is very much less. You have, no doubt, noticed a great deal of our work lately in the *Idler* magazine, of which, as well as of *To-day*, Mr. Adamson is the Art Editor." "What do the printers think of the process?" said I. "It is their salvation. Since engraving largely went out, the London editors have had unceasing trouble with the London printers. In this time of close competition, it has been impossible to pay printers for the necessary trouble of 'making-ready' half-tone blocks as finely as they should be, even when there has been sufficient time to do so. With blocks such as these a great deal of this trouble is dispensed with, and the average printer will find our productions as easy to print from as wood-engravings."

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, October 8, at eight p.m., at the Gallery, 5A, Pall Mall East. *On the Formation of the Dots of the Half-tone Screen Image*, by Mr. W. K. Burton, C.E. The President's Annual Address and the Presentation of the Medals.

EDINBURGH PHOTOGRAPHIC CHEMISTS AND THE PHARMACY ACT.—Acting Sheriff-Substitute Sym, in the Edinburgh Sheriff Court, on Tuesday, September 25, delivered judgment in the prosecutions under the Pharmacy Act, in which he heard evidence last week. He found that John Turnbull, Rose-street, was not guilty of keeping open shop for the retailing, dispensing, and compounding of poisons, and not guilty of using the word "chemist" in an unlawful way. William Hume was found guilty of keeping open shop for the retailing, dispensing, and compounding of poisons, but not guilty of unlawfully using the word "chemist." The Sheriff said he did not think either of the respondents was entitled to retail poisons, and he thought that "wholesale," as used in the proceedings, ought to mean selling in gross for the purpose of retail selling afterwards. He did not intend to go into any discussion on the words, because he found them so defined in the statute itself. With regard to the case of Mr. Turnbull, it was proved that he was a dealer in articles of all descriptions used in photography. Some of these articles were chemicals, and some were poisonous. His instructions to his assistants were, not to sell such poisons in retail, but only to persons engaged in photography and to chemists, and it appeared that numbers had been refused when they asked for these poisons. His Lordship also found that in a circular issued by Mr. Turnbull there was a clause inserted to the same effect. While the quantity of perchloride of mercury which was sold was probably sufficient to constitute an offence by the assistant or shopkeeper against the Statute, he was of opinion that Mr. Turnbull did not keep open shop for the purpose of retailing, dispensing, and compounding of poisons, and he therefore found the first charge not proven. As to the second charge, he found that the respondent did not intend to represent himself as a chemist in the ordinary sense, and he did not think that respondent had used the word "chemist" in the sense that was struck at by the Act. This charge also he found not proven. On behalf of the respondent, Mr. Trotter asked for expenses, but the Sheriff said he did not think it was a case for allowing expenses. It was proved, said the Sheriff, that Mr. William Hume was a scientific instrument maker and a chemist, although not in the ordinary sense. The offence charged against him was that he sold a retail quantity of cyanide of potassium for the purpose, as the purchaser alleged, of cleaning silver. It was sold by a chemist, who, however, was not qualified under the Pharmacy Act to dispense poisons. Mr. Hume considered that he was at liberty to sell such drugs. This was a retail transaction, and one in the respondent's ordinary course of business. That being so, he considered that respondent's action constituted the offence of keeping open shop for the compounding, dispensing, and selling of poisons. Under the circumstances he would impose a nominal penalty of 1s., but respondent must pay the costs of the prosecution, modified to 2*l.* 2*s.* In regard to the second charge, that of using the word "chemist" unlawfully, the Sheriff said he took the same view of "technical chemist" as he did of "photographic chemist," and found this charge not proven. Mr. Morison, on behalf of the Pharmaceutical Society, asked that a case should be stated to a higher court in both cases, Hume's case being included, so that the use of the word "chemist" might be considered by the Justiciary bench.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.—On October 11, at a meeting to be held at 12, Hanover-square, London, W., the present Committee of the Photographers' Benevolent Association will make a final appeal to the public. Unless there is some reasonable response, the Association will cease to exist. The Association was founded some twenty-two years ago, and was practically reconstructed in 1890, when payments to the Secretary ceased. The first Hon. Secretary was Mr. H. J. Beasley, in whose hands, with the able assistance, for a time, of the late Mr. William Benham, things went fairly well. The unfortunate death of Mr. Benham, and the removal of Mr. Beasley from London, again left the Association without a Secretary. Photographers were so little interested that no one was willing to take the work, and for several months it was done by Mr. W. J. Tabrum, a gentleman who had taken over Mr. Beasley's business, and who was not connected with photography. In July, 1892, Mr. Tabrum resigned, and things were about as bad as they could be, for the Committee was quite unable to find any one willing to take his place. There seemed a complete deadlock. The present Hon. Secretary at length offered to take the office on the distinct understanding that it should be for a short time only, and that efforts should be made to replace him as soon as possible. Several members of the Committee who had resigned from simple inability to attend the meetings were pressed to allow their names to remain because it seemed impossible to replace them. From that time to the present the case has remained much the same. Each year the photographic public has been earnestly invited to the annual meeting of the Society, and the attendances have varied from one to four persons in addition to the Committee. Each year the Treasurer has resigned on account of his many other duties, but the Committee found it impossible to replace him with any one who showed any interest in the Association, and so almost forced him to retain his position. The Hon. Secretary and several of the Committeemen were in the same position—anxious to retire, but unable to find successors. Critics of the Association have said that, "with a really influential Committee, the Benevolent could be made a great success," but in every case, when pressed to join the Committee and help in its work, they have absolutely refused. We may recapitulate the financial statistics of the last few years. 1891. Receipts, 96*l.* 10*s.*; grants and loans, 68*l.* 11*s.* 6*d.* 1892. Receipts, 149*l.* 6*s.* 3*d* ; grants and loans, 28*l.* 16*s.* 6*d.* 1893. Receipts, 110*l.* 14*s.* 1*d.*; grants and loans, 143*l.* 17*s.* 4*d.* 1894. Receipts, 51*l.* 0*s.* 10*d.*; grants and loans, 141*l.* 19*s.* 1895 (to date). Receipts, 73*l.* 11*s.* 8*d.*; grants and loans, 93*l.* 8*s.* 2*d.* It will be seen that, in spite of strong assistance from the whole of the photographic press, of the best efforts of the Committee, and of frequent appeals to the benevolence of photographers, the income steadily decreased, although the expenditure in relief for the needy increased rapidly. At length, in March last, the available funds were entirely exhausted, and the Committee decided upon a most urgent appeal to professional photographers and assistants. The appeal was made through the photographic press, and a special urgent circular was posted to 1080 of the leading British photographers, enclosing subscription forms for themselves and their staffs, and asking that they would place the matter before their assistants. The total result was seventeen replies, with donations and subscriptions amounting to 10*l.* 10*s.* 3*d.* This statement is made at the request of the Committee of the Benevolent in order that any who may be interested in the work of the Association may realise the critical and important nature of the meeting called for October 11.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 17,892.—"Perfect Photographic Developing Dishes." F. MELTON.—*Dated September*, 1895.

No. 17,893.—"Improvements in Photographic Printing Frames." L. DAWKINS.—*Dated September*, 1895.

No. 17,930.—"Improvements in Photographic Cameras and Magic Lanterns." W. FRIESE-GREENE.—*Dated September*, 1895.

No. 17,984.—"Improvements in View-finders for Photographic Cameras." W. BROUGHTON.—*Dated September*, 1895.

No. 18,044.—"An Improved Process for Enamelling Photographic Proofs." E. CHESNAY.—*Dated September*, 1895.

PATENTS COMPLETED.

IMPROVEMENTS IN THE MANUFACTURE OF COLOURED DRY PLATES FOR PHOTOGRAPHY.

No. 16,693. EMILE DE CONINCK, 91, Maisons aux Aiguilles, Ghent, Belgium. *August* 24, 1895.

THE novelty of this invention consists—

(1.) In making the colour of the product foreign to the normal colour of the material which is sensitive to the light, this entirely artificial colouring being obtained by the addition of colouring substances, either to the sensitive material itself or to the different kinds of supports on which it may be spread.

(2.) In making the colouring permanent and capable of enduring all necessary manipulation.

(3.) In the effective character of the results produced as regards (A) the nature of the plates themselves, which attain greater sensibility and transparency, and (B) in the preparation of proofs, which is greatly facilitated.

The system has this novel and hitherto unknown peculiarity of the plates being and remaining freely coloured.

These plates are made of glass, coloured in different tints, and coated with a very thin and level layer of gelatine.

They are allowed to dry and are then sensitised by bromide of silver. The tints can also be obtained by indelible colouring substances, which have no action on the gelatine layer, and which are added thereto at the moment of applying it to the glass. In this case the glass is not coloured.

The colouring of my plates is permanent and indelible, and remains after all the manipulation to which they are submitted.

The colouration of the plates has a grand influence both on the nature of the plates, of which they modify the qualities, notably the sensibility, transparency, and mellowness according to the colouring employed and the results, which are desired; and also on the pulling of proofs for printing by the aid of *clichés* made upon coloured plates, which permit results to be obtained unattainable with ordinary plates.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—Coloured dry plates for use in photography, prepared either with coloured glass, or of uncoloured glass, to which a very thin and level layer of gelatine is applied, which is sensitised by bromide of silver after drying, and to which is added in the second case, at the moment of application, indelible colours having no action on the gelatine, as herein described and explained.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, exterior and interior backgrounds for quarter-plate outfit.—Address, P. DOLAN, South-street, New Whittington, near Chesterfield.

Wanted, a good wide-angle rapid rectilinear, 7×5 or whole-plate. Will exchange twenty-seven consecutive volumes of the *English Mechanic*, splendidly bound, and cash, for really good one.—Address, E. A. PRESTON, 8, Burnhill-road, Fairfield, Beckenham, Kent.

Wanted, Thornton-Picard time and instantaneous shutter, with speed indicator, to fit two-inch lens tube, in exchange for studio shutter of same class and makers, to fit four-inch tube, practically new.—Address, G. JONES, 33, Devonshire-street, Monkwearmouth, Sunderland.

Hand camera wanted, good make, quarter-plate, to carry twelve or more films. Approval required. Will give in exchange Lancaster's "Le Meritoire" quarter-plate camera, in perfect condition, with two double dark slides, case, and stand, and from 100 to 200 good quarter-plate negatives (according to value of hand camera) of English or Welsh scenery.—Address, R. STEMSON, 20, Varna-road, Birmingham.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
7	Camera Club	*Light in Photography.* Captain W. de W. Abney.
7	North Middlesex	
7	Peterborough	
7	Richmond	
7	South London	
7	Stereoscopic Club	
8	Birmingham Photo. Society	Exhibition of Competition Pictures.
8	Hackney	
8	Manchester Amateur	
8	Newcastle-on-Tyne & N. Counties	
8	Paisley	
8	Rochester	
8	Royal Photographic Society	*On the Formation of the Dots of the Half-tone Screen Image.* W. K. Burton, C.E.—The President's Annual Address and the Presentation of the Medals.
8	Stockton	
9	Ashton-under-Lyne	Exhibition of Members' Lantern Slides.
9	Croydon Camera Club	Photographic Chat.
9	Ipswich	
9	Leytonstone	Presidential Address and Judging of Prints.
9	Munster	
9	Photographic Club	Members' Open Night.
9	Stockport	
10	Bradford	Exhibition of Members' Lantern Slides.
10	Camera Club	
10	Cheltenham	
10	Glossop Dale	
10	Hull	
10	Leeds Camera Club	*Collodion* versus *Gelatine.* A. Gaunt.
10	Leicester and Leicestershire	
10	Liverpool Amateur	Lantern in Use for Members.
10	London and Provincial	
10	Manchester Photo. Society	
10	Oldham	
10	West London	
10	Woolwich Photo. Society	Annual Business Meeting.
11	Bristol and West of England	
11	Cardiff	
11	Croydon Microscopical	
11	Halifax Camera Club	
11	Holborn	
11	Ireland	
11	Maidstone	
12	Hull	
12	North Middlesex	Excursion: Hampstead Heath.

Hackney Photographic Society.—September 24, Dr. Gerard Smith presiding.—In the course of the evening a lecture and demonstration were given by Mr. W. ETHELBERT HENRY on the *Dusting-on Process.* He said that the principle of the process rested on the affinity of a moist gummy substance for dust in any form. A solution of glue and water, when dried, would harden and withstand atmospheric influence; but, if a substance such as glucose, dextrine, gum arabic, honey, or lump sugar, were added, the film so produced would be sensitive to the moisture in the atmosphere. Then, if a solution containing a dichromate were added to this, the film would become sensitive, not only to moist air, but to light also, because light had the power to so act upon this chromatised mixture as to render it insensitive to the atmospheric moisture. Plates of glass were coated with a mixture of fish glue, 1 part; glucose, 4 parts; water, 10 parts; sensitised with a solution of ammonium dichromate, 1 part; water, 10 parts. When dry, which was done in a few seconds by means of heat, the plate was placed in contact with a transparency in a printing frame and exposure made. Printing did not take very long, and should be judged by means of an actinometer. When judged to be sufficiently printed, the plate was taken from the frame, warmed, and then developed by gently dusting with cotton-wool, dipped in a powder of whatever colour required. The result of the printing would be this: All those parts which had been protected more or less from light under the negative would absorb the atmospheric moisture in inverse proportion to the amount of light received, and so present a "tacky" surface for the powder to adhere to. Hence the necessity of using a transparency of the same character as the copy required, viz., a negative for a negative, a positive for a positive. After development, the superfluous powder was wiped off, and the now developed plate coated with collodion, and, when this was set, placed into a dish of water. This dissolved the mixture of glue and glucose, and the powder image remained embedded in the collodion film, which could then be floated off and placed on a permanent support. Mr. Henry showed how, by modifying the after details, this process could be applied to many uses, of which not the least were lantern slides, reversed negatives for the single-transfer carbon process, and ceramic enamels.

Leeds Camera Club.—At the meeting last week of this Club there was a large gathering of members, and a good contingent from the Bradford Photographic Society. Dr. THRESH (the President) commenced his series of lectures on *The Chemistry of Photography*, and took for the subject of the lecture *The General Principles of Chemical Philosophy.* Attention was drawn to the fact that all which goes to form this earth and the atmosphere around it are resolved into solids, liquids, and gaseous substances, which, when reduced to their ultimate elements, as far as the science of chemistry enables us to say up to the present day, would number about seventy. Whilst the majority of these elements occur in nature in a combined state, there are some few which are to be found uncombined. None of these combined elements can be determined by any of the natural senses, but the art by which all these compound substances are resolved into their respective elements forms the science of chemistry. Whilst this art has the power to reduce these compound substances to their simple elements, which is known as "analytical chemistry," it has also the power to build up from the same elements such a multiplicity of compounds that the human mind can scarcely grasp, and this is called "synthetical chemistry." The common elements bearing on photography, metallic and non-metallic, were then discussed, and the difference between a mixture and a chemical compound was afterwards demonstrated. Perhaps the most difficult part about chemistry to the beginner is the grasping of the idea of what an atom or a molecule is, but the lecturer, knowing this, spent a good portion of his time in clearing up the subject to the uninitiated mind. Having surmounted this difficulty, the remaining part of the lecture became more simple. Chemical force, notation, the laws of chemical combination, elements and their compounds, all received their share of attention, together with definitions of many terms which are used in chemistry. The latter part of the lecture was occupied by describing singly all the elements, both gaseous, liquid, metallic, and mon-metallic, together with their compounds, which are used in photography. The next meeting of this Club will be held on October 10, when Mr. A. Gaunt will give a lecture on *Collodion* versus *Gelatine.* The annual dinner will be held on October 3.

Liverpool Amateur Photographic Association.—The Ninth Ordinary Meeting of the Thirty-second Session was held in the Club-rooms, Percy-buildings, Eberle-street, on Thursday evening, September 26, the President (Mr. G. B. Newton) occupying the chair. Two new members were elected. The CHAIRMAN informed the meeting that he had a very pleasing duty to perform in asking Mr. John H. Welch, the retiring Hon. Secretary, who was present, to accept a gift of a silver salver, subscribed for by members of the Society as a slight token of their appreciation of the services he had rendered, after which a lecture was given by Mr. W. Plummer, M.A., F.R.A.S., of Bidston Observatory, who spoke on *Astronomical Photography* in an exceedingly attractive and original manner, his subject being illustrated by a series of graphic lantern slides, the chief of which were Professor Bernard's views of the Milky Way, Professor Henry's views of Jupiter and Saturn, and Dr. Isaac Roberts's views of the Nebulæ, compared with pictures made by artists through the telescope. A cordial vote of thanks was given to Mr. Plummer at the close of his lecture.

Brechin Photographic Association.—The Annual General Meeting of the above was held in the new premises, Park-road, on Wednesday evening, Mr. J. D. Ross (Vice-President) in the chair. There was a large attendance of members and friends, both ladies and gentlemen. The CHAIRMAN congratulated the members on the new premises which had now been acquired, and gave an outline of the history of the Association since its formation in 1888. After hearing the reports of the various officials, which were very satisfactory, the following office-bearers were then elected for the ensuing year:—*President:* Mr. Shaw Adamson, Careston Castle.—*Vice-Presidents:* Messrs. James D. Ross and Robert W. Duke.—*Committee:* Messrs, J. Cuthbert, W. Dakers, and J. Small.—*Curator:* Mr. D. B. Robertson.—*Treasurer:* Mr. James Mitchell.—*Secretary:* Mr. Alex. Watson, 75, River-street. A set of Australian slides were then exhibited, Mr. J. B. Terrace reading the lecture, and Messrs. Mitchell and Robertson manipulating the lantern. The usual votes of thanks concluding a very successful meeting.

FORTHCOMING EXHIBITIONS.

1895.	
Oct. 4–Nov. 2	*Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 4–Nov. 14	*Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
,, 23, 29	East London Photographic Society. Hon. Exhibition Secretary, F. Uffindell, 29 Scrutton-street, Finsbury, E.C.
,, 28–Nov. 2	*Southport. G. Cross, 15, Cambridge-arcade, Southport.
,, 29–Nov. 1	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.
Nov. 19–21	*Hackney. W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 28–30	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

EDINBURGH PHOTOGRAPHIC CHEMISTS AND THE POISONS ACT.

To the EDITOR.

SIR,—Many thanks for your very concise report of this matter. I enclose you the leaders of two evening papers on the subject, which you may not have seen. Though I have at present got a judgment in my

favour, I am not yet out of the wood. As my agent has received a case which will carry it to a higher Court, I beg of you that you will do your best for the trade and profession in this matter, as their support will be much needed in order that a proper decision may be come to in these matters.—I am, yours, &c., J. M. TURNBULL.

6, *Rose-street, Edinburgh, September* 30, 1895.

HYPO STAINS.

To the EDITOR.

SIR,—In a recent issue some one, I think E. Dunmore, complained of brown spots on negatives, and stated that he had tried HCl. to get rid of them. Results—what any one would expect. Let him try very weak sulphuric acid, say 1 in 20, and he will be O.K. I have been there, seen as many as a million or two on a 11 × 14 at once. Cause: iron dust getting into fixing bath, through downright, rank carelessness.—I am, yours, &c., J. D. TODD.

September 19, 1895.

REDUCING DENSITY.

To the EDITOR.

SIR,—As I note one or two cases in this week's issue of THE BRITISH JOURNAL OF PHOTOGRAPHY *re* dense negatives, probably your correspondent might find bleaching his negative in bichloride of mercury *without* the subsequent darkening with ammonia would give him a colour soft enough to enable him to get his high lights printed before the shadows were bronzed. It is an old remedy, but one I have occasionally found of service.—I am, yours, &c., J. WALLIS.

Queen's Park Studio, 11, *Ormerod-rd., Burnley, September* 27, 1895.

PHOTOGRAPHIC COPYRIGHT IN ITALY.

To the EDITOR.

SIR,—In reference to the question of photographic copyright discussed in your columns, allow me to inform your readers that there is no such thing as copyright in a photograph in Italy, photographs not being recognised as works of art. They may be registered, but this will not secure them from being copied with the most trivial alterations, and there is no substantial compensation for infringement.—I am, yours, &c.,

W. J. STILLMAN.

"THICK AND THIN PLATES."

To the EDITOR.

SIR,—I shall feel greatly obliged if "Profanity" will kindly inform me of the name and address of the maker of the thin plates, for their thinness of which he complains would be an advantage for my purposes in which the negatives would not be printed from by contact; also whether the supplies he gets from the said maker are always of one uniform "thinness," or, if not, perhaps he will extend his kindness by sending me one of maximum and one of minimum thickness, or a piece of each would suffice if more convenient to him; and, further, whether one of the good qualities of which he speaks so highly is fineness of deposit, as my negatives sometimes have to be enlarged from considerably. I hardly need add that I will, of course, gladly reimburse him the postage, &c., he may incur in supplying me with this information.—I am, yours, &c.,

ARTIST.

To the EDITOR.

SIR,—The chief objection to the use of glass plates being their *weight*. I read with much surprise the complaint in your last issue as to the use of thin glass. My experience is that the thinner it is the better the quality being good, and, if it is affected by the pressure of the dark slide springs, by all means get more suitable springs, but don't go back to thick glass, or films will drive it out of the market.—I am, yours, &c.,

EXPERIENCE.

To the EDITOR.

SIR,—It may interest "Profanity" to know that I had a batch of six-dozen plates this summer by a good maker which varied in thickness greatly in the same box and not only between box and box.

In the extreme cases the thickest glass was some 90 % thicker than the thinnest specimens, but I may say that in no case did the plates approach *extreme* thinness. Such variation is, however, undesirable. Apologising for troubling you,—I am, yours, &c., C. L. S.

To the EDITOR.

SIR,—Since my letter last week on the above subject, I have heard from one of the largest firms of plate makers, who promise to do their best to take steps to supply plates on a uniform thickness of glass. Now this is a movement in the right direction, as I feel sure it only needs the biggest firms to combine and demand a more even make of glass in order to obtain it, and the firm I mention are just the ones to do it.—I am, yours, &c., PROFANITY.

FREE PORTRAITS.

To the EDITOR.

SIR,—Can I claim your indulgence for just one more letter *re* M. Jarchy's so-called free baby photographs. I noticed in your JOURNAL M. Jarchy called some very old-established photographers in this district parasites and pirates. I think this term was more suited to some one else. I beg to send you a copy of a letter he sent to me last Friday, after he had seen my challenge in your JOURNAL.—I am, yours, &c., W. HILL.

62, *Eugenia-road, Rotherhithe, S.E.*

"To Mr. HILL & Co., Eugenia-road, Rotherhithe.

"GENTLEMEN,—We are very pleased to see your convulsive state of mind and your grievance for not obtaining the free photograph of your babies. We are equally pleased that we guessed it right to do so, as you and another two of the complainants are the only minimums of the large quantity of parents who have obtained the free photographs and signed their testimonials to me. 460 high testimonials are on view.

"There is a grocery shop open not far from me where 10,000 babies are wanted to whitewash Blackheath; perhaps you will have more luck there to get things for nothing. We did not take any notice in the local paper of your letter, and we will not stand so low as to answer you publicly, as it will be too much honour for you.—We are, yours, &c., JARCHY BROS.

"*The Green House, Union-road.*"

To the EDITOR.

SIR,—Are not W. Hill and "*Bonâ-fide* Amateur Photographer" themselves to blame if they feel like "victims?" We confound cause and effect. Is not a restless, bargain-hunting spirit the pest of our day? Are not the people who so eagerly rush in whenever they scent a "rare opportunity" themselves the inducement for adventurous men to bait their traps as is reported M. Jarchy did his? If people's cupidity did not blind their reason and pervert their sense of equity, we should not see the crowds that now surround every Cheap Jack who proclaims his intention to give something for nothing.

"Certes the pleasure is as great
In being cheated as to cheat."

Morally, both he and they are cheats. He is a cheat, for he never yet did what he says he will; and they are cheats in intent because they wanted to get another man's labour without giving a stroke in return.

Besides "free portraits" and "free enlargements," we have the charming coupon system. Every three months, at my private address, I receive by post, from a well-known West-end photographer, a "Special Favour Coupon," duly announcing that, till the end of the current quarter, half prices only will be charged. If "a penny saved is a penny gained," and if this philanthropist gives 5*s.* for 2*s.* 6*d.*, I presume the more his customers spend the more they save. "Thrift, thrift, Horatio!" But the coupon is only another bait thrown to tickle the gullets of the foolish.—I am, yours, &c., LINDSAY HEMERY.

Tavistock House, Brockley, S.E.

To the EDITOR.

SIR,—I am not to answer those two letters of last week that appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY, as they are only automatic tools of a certain person antagonist, and it is of very little importance to me their writing.

I am sending you a printed guide to my enterprise, in which it is explained my name and intention. Besides, as an established man, I am answerable for my actions against the social life if I do wrong.—I am, yours, &c., A. L. JARCHY.

September 30, 1895.

PHOTO SECTION STANLEY SHOW.

To the EDITOR.

SIR,—Kindly announce in your next issue that it has been decided to place in the hands of the Judges two silver medals for award to exhibitors in the Apparatus Section: One silver medal for the best hand camera for a cyclist; one silver medal for the best novelty in photographic or optical lantern apparatus or accessory. Both medals must not be awarded to the same article, but there is no other restriction. —I am, yours, &c., WALTER D. WELFORD.

Stanley Show Office, 57 and 58, Chancery-lane, W.C., September 30, 1895.

THE CORNWALL EXHIBITION.

To the EDITOR.

SIR,—In your report this week on the awards at the Cornwall Polytechnic, you have given me a *second* silver medal. It is an error, my picture is awarded *a first silver medal.* Please correct and oblige.—I am, yours, &c., J. C. BURROW.

Camborne, Cornwall, September 28, 1895.

THE LEEDS EXHIBITION—A DEFENCE.

To the EDITOR.

SIR,—Allow me to thank you for your favourable mention of my work in the present Leeds Photographic Exhibition; but may I also be allowed the right to defend myself against the ruthless attack on *one* of my exhibits? I have been complimented time after time in sending such an excellent and uncommon subject as *The Head of a prize Shorthorn Heifer.* The commonplaceness of the subject seems to have struck your critic alone, who is evidently no judge of cattle, and can see no beauty in the outline and proportion of a thoroughbred shorthorn, as "this wretched heifer's head" belongs to a beautiful animal, worth 1500*l.*, which is owned by a well-known Yorkshire shorthorn breeder, within ten miles of Leeds. £1200 was refused for this very animal a short time ago.—I am, yours, &c,, C. R. H. PICKARD.

197, *Belle Vue-road Leeds, September* 30, 1895.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

PHOTOGRAPH REGISTERED:—

W. J. Jaucowski, 3, Old Market-place, Grimsby.—*Photograph of Grimsby Town Football Club.*

S. J. W.—Thin the varnish down with methylated spirit. In this case the mineral spirit will do no harm.

H. TILSON.—Both the Eastman Company and the Blair Company supply rollable film. We know of no other firm that is supplying rollable film in this country at present.

WELLINGBOROUGH.—We are quite unable to answer the question. Better write to the makers and ask when they will be prepared to supply larger sizes. It is quite possible they are able to make any size at once that you may require.

W. C. E.—The frilling is no doubt due to the hot weather we have experienced of late. Bear in mind that, if a negative be held long between hot fingers to examine it while developing, any plate will be liable to frill when the temperature is very high.

ANXIOUS.—If you advertise for what you require, you will doubtless obtain it; or if you apply to any of those who supply "process" requirements, such as Penrose & Co., they will probably be able to procure what you want, though not, perhaps, for the sum named.

C. L. S.—If the paper gives blue prints that do not wash away with some subjects and does so with others, it must be something to do with the manipulation, but what it is, of course, impossible to say. Try another brand of paper; perhaps you will get on better with that.

J. SOMERS.—The report *re* gas cylinders has not yet been issued; but, whatever it may be, it will not necessarily, as you appear to surmise, have any effect on the conditions laid down by the railway companies as to their conveyance over their lines. Railway companies and other carriers can, of course, make their own terms upon which they will convey certain classes of goods.

CONFUSED.—In a studio but twelve feet long it would be impossible to take full-length figures, except by using very short-focus lenses, when, of course, the perspective will be violent, and the results unpleasant to a degree. In such a studio we should advise our correspondent to confine his work to bust, or half-length portraits at most. The arrangement of blinds will do quite well.

W. W. (Westgate).—It is as you say. Blocks by the same producers appear very different in different publications. Some of the cheaper illustrateds produce better prints from process blocks than do some of the more expensive ones, although the blocks are by the same houses. It is simply a question of printing, and the paper. That is not generally the case with foreign workers.

R. E. MITCHELL.—We fear you will not be able to make a lined screen by photographing a ruled surface, or printing from a borrowed ruled screen, that will be at all equal in the results produced to working with a good direct ruled screen. The great advance in process work during the past few years is due to the perfection of the present screens. They may be costly, but that is but a mere bagatelle when a good result is the end to be attained.

C. T. W.—Passports are not required either in France or Germany, but we have several times in this column strongly advised photographic tourists on the borders of the two countries to be provided with them. We do so again in your case, as just now there have been several arrests of supposed spies, who are alleged to be seeking details of the fortifications, &c. Our advice is, Avoid photographing anywhere in the neighbourhood of fortifications, and have an English passport with you.

INQUIRER (Putney).—In producing enlargements where an enlarged negative is required—as, for example, with the carbon or the platinotype processes—the best results are supposed to be obtained when a carbon transparency is employed. However, we have seen results equal, or nearly equal, when other processes have been employed for the transparencies. As a matter of fact, those who make this class of enlargements commercially do almost invariably use carbon transparencies, and they have, doubtless, a very good reason for doing so, otherwise they would not.

C. A. A.—So far as formulæ and procedure, as per your letter, are concerned, things are all right; but where you have failed we are unable to explain. Are you sure that you have been supplied with the right materials? We advise you to repeat the experiments with materials obtained from a London house that make a speciality of such chemicals—Mawson & Swan or Hopkin & Williams, for instance. The chemists and druggists in small towns are not likely to have chemicals that they seldom are asked for in good condition, that is, if they are liable to depreciate by keeping.

C. PHILLIPS writes with reference to the relative cost of installation of the electric light and the incandescent gaslight, the comparative cost in their working, and also their general efficiency for portraiture and copying during the winter months. He tells us that the electric current can be obtained from the town supply, but he will have to do the fittings.—As to the cost of the fittings, the gas will be the least costly, but we expect that, taking the mantles of the incandescent light and their fragility into consideration, the electric light will be the cheapest in working, and its convenience and general efficiency certainly the greater.

CONTENTS.

	PAGE
OUR FORTHCOMING ALMANAC	625
COPYRIGHT MATTERS FROM THE OWNERS' STANDPOINT	625
THE INTENSIFICATION OF PROCESS NEGATIVES	626
ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION	628
PHOTOGRAPHS FOR BOOK ILLUSTRATIONS.—II. By T. N. ARMSTRONG	631
METHODS OF STRIPPING GELATINE NEGATIVES	632
SOME REACTIONS OF FORMALDEHYDE. By T. H. LEE	632
BACTERIA IN GELATINE	632
"THE LAY FIGURE" AND PHOTOGRAPHY. By THE LAY FIGURE IN THE STUDIO	633
ROYAL CORNWALL POLYTECHNIC EXHIBITION	633
EDINBURGH PHOTOGRAPHIC CHEMISTS AND THE POISONS ACT	634
METHOD IN PHOTOGRAPHY. By WILLIAM F. MILLER	634
THE "DAILY CHRONICLE'S" ATTACK OF PHOTOGRAPHIC HYSTERICS	635
OUR EDITORIAL TABLE	636
NEWS AND NOTES	636
RECENT PATENTS	637
EXCHANGE COLUMN	637
MEETINGS OF SOCIETIES	638
FORTHCOMING EXHIBITIONS	638
CORRESPONDENCE	638
ANSWERS TO CORRESPONDENTS	640

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OUR FORTHCOMING ALMANAC.

The Almanac for 1896 being now in course of preparation, we take the opportunity of inviting our friends to contribute to its pages short practical articles descriptive of their recent experiences and experiments in photography. The popularity and value of the Almanac have always been largely due to the inclusion in its pages of many contributions from photographers of great ability and knowledge, a feature in which we cordially invite the co-operation of our readers in all parts of the world.

We shall also be glad if intending contributors will let us have their articles, sketches, &c., at as early a date as possible, so that the risk of their having to be omitted through lateness of arrival may be obviated.

Secretaries of Societies, and especially of those founded during the year, if they have not already done so, will oblige by at once forwarding lists of officers for inclusion in the directory of photographic Societies, so that this section of the Almanac may be made as complete as possible.

Our publishers inform us that the advertisement spaces are rapidly filling up, and intending advertisers are therefore requested to send in their copy and orders at once.

IS HAND WORK LEGITIMATE ON PROCESS BLOCKS AND PHOTOGRAVURE PLATES?

A recent issue of the *Publishers' Circular* gives an interviewer's account, an extract of which we gave last week, of a visit to a process-block maker's, and why hand labour is expended on the blocks as a means to their improvement. The interviewer treats this matter as if it were a novelty only just introduced into this country. As a matter of fact, hand work has been common enough for years past among the leading process workers, though it has not perhaps been carried to the extent it has been by some American and Continental houses. Why this should have been the case, it is a little difficult to conceive, unless, indeed, it is the additional cost entailed, for at the present time process blocks are turned out by some at such prices that, if any really skilled engraver's work were expended upon them, they would fail to be remunerative to the makers.

In many instances, to convert an ordinary good block—good so far as the process part of it is concerned—into a high-class printing one—comparable with a wood-engraving, the engraver's work would often come to as much as, or more, than the block is supplied for, such is the present state of competition in the half-tone block business. Indeed, blocks are now being made by little masters, whose limited business, and the small price at which they work, would not enable them to employ even a third-rate engraver, and it is against this class of worker that the larger houses have to compete in price. What makes the matter even worse is that publishers, and others who use the blocks, seem, in many instances, to consider their cost as being of more importance than the illustrations as they appear in their publications.

It is an unfortunate thing in connexion with the photo-mechanical methods—whether process blocks, photogravure, collotype, &c.—that there is a great tendency with all of them, as at present worked, to render but a short range of tones; that is, the results are flat and grey as compared with engraved plates or wood blocks. It is therefore necessary, in order to make the photographically produced plate yield impressions at all comparable with them, to extend the scale of tones at both ends, that is, enhance the high lights and intensify the deep shadows; and that is what the foreign workers have been doing all along, while we have, to a large extent, ignored hand work for the purpose. We have on several occasions advocated a larger expenditure of hand labour on both blocks and intaglio plates than they generally receive in this country, or, at least, until they can be produced of a character more closely resembling the work of the engraver.

When hand work is employed here, it is too frequently of a mediocre kind. It is thought by some, as there is a photographic base to work upon, that highly skilled labour is unnecessary, and that of a cheaper kind will suffice. That is a mistake, if the highest class results are the end in view. To make the best of a plate, skilled work is imperative, and we know that, in some of the Continental houses, the most expert engravers obtainable are engaged, and are paid large salaries. The same remark applies, though in perhaps a lesser degree, to half-tone blocks. Of course this means an important item in the cost of production, but not always to the extent that some might surmise. A comparatively few touches by a masterly hand will often be far more effective than a large expenditure of time by a less competent worker, while the quality of the work will be the better.

It may be asked if so much hand work is legitimate in processes that are supposed to be really photographic ones? In that there may be more than one opinion. If the results are put forward as being purely photographic, it would not. But that is not the case, either with process blocks or photo-

gravures, so far as the public is concerned, and it is the general public that is catered for. It cares nothing for, and it takes no interest in, the methods by which the results are produced. All it cares for is that they are good.

Some may be inclined to raise the question as to whether the truthfulness of photography is not, to an extent, jeopardised by the hand work. It may be, or it may not. If skilfully done, it will not; indeed, in many cases it will be really improved rather than otherwise. Take, for example, an intaglio plate from a painting as yielded by the process of photogravure. Are all the colours, notwithstanding the latest in orthochromatic photography, so correctly translated into monochrome as to satisfy the artist who painted the picture, or the public who is expected to purchase the reproductions? We answer that, in the majority of instances, they are not, neither is the range of tones from highest lights to the deepest shadows such as an engraver would render them. Therefore, the dexterous use of the roulette and scraper not only improves the artistic character of the plate, but renders it a truer transcript of the original.

The same may be said with regard to the expert use of the graver in the case of half-tone blocks. The untouched photographic result yields a block which, when printed as the general run of process blocks are, unfortunately, now printed, gives a print that is not true to the original or to nature, inasmuch as the lights are grey instead of being white, and the deepest shadows are only dark grey instead of being of a strong black, as they ought to be. We are here supposing that the original is simply in monochrome; but, if it were in colour, the truthfulness, as in the case of photogravure, would be really enhanced by judicious manipulation.

Seeing that, why, then, should the legitimacy of the means employed to secure the end in view be questioned, when it is considered that half-tone process blocks take the place of wood-engravings, and photogravures that of line and mezzotype engravings; also that the public look upon them in that light, and not as photographs?

THE CHOICE OF METHODS IN INTENSIFICATION.

When a negative is found to require intensification in order to obtain the very best result possible under the immediate circumstances, it is absolutely necessary to exercise judgment in the choice of methods, as the plan or process that will answer under certain conditions may prove perfectly unsuitable under others. For instance, the requirements of a negative in pure half-tone are widely different from those of a line reproduction; and, again, an image that only needs reinforcement to a comparatively slight extent to render it a perfect printer may be treated by methods that would entirely fail where a considerable degree of additional density is required. Negatives too, that present perfect, or at least satisfactory, gradation are more easily handled than those in which it is necessary to either reduce or increase the contrast; in fact, there is ample scope for the exercise of judicious selection in the method of procedure, as well as in the actual manipulation.

For ordinary negative work—that is, where the printing is to be by a process that gives natural half-tone—the choice of method will depend not only upon the amount of intensification required, but also, as just remarked, upon the character of the gradation or, what amounts to nearly the same thing, upon the exposure; but for negatives intended for "process," in which the lights and shadows are represented by alternately opaque and transparent lines or dots, the task is confined to the production of the nearest approach to opacity that can be obtained without clouding or filling up the transparent portions. It is true that in such subjects an advantage may sometimes accrue, and especially in negatives made with the screen, from a slightly disproportionate action on the higher lights and shadows respectively; but, where this is the case, the necessary conditions must exist in the negative before the treatment, and not be left to any local manipulation during the process. The effect, in fact, is confined to a partial filling up of dots or lines that have been left too open by the developer proper.

It is not our intention in the present article to deal with the treatment of ordinary half-tone negatives, but to speak of the various methods available for the production of density without regard to gradation in the usual photographic sense—to the treatment, in fact, of images in which the object is as nearly as may be to increase the opacity of the deposit in a uniform manner over the whole surface. This may be considered a sufficiently easy task, and so, perhaps, it is with a suitable negative as compared with that of satisfactorily modifying the gradations of a defective half-tone negative; yet it requires some judgment in the choice of methods, if only in connexion with the amount of intensification required.

Starting with the negatives in perfect condition for intensification, as described in our previous article on this subject, they may be divided into two chief classes—those that require but little, and those that need a considerable, amount of reinforcement; while to some extent the treatment will again depend upon the process by which the negative has been obtained — collodion or gelatine. The processes may be divided into two classes, the first consisting of intensification with silver in conjunction with acid, pyro, or other reducing agent, in which, as already shown, the action is similar to that of the developer, and is, in fact, a continuation of that action, and therefore capable of altering the ratio of gradation; the second class covers all those methods in which the printing value of the deposit is altered, either by simple change of colour, as in the use of the alkaline sulphides, or by the addition of some other metal, as in the methods based upon the use of mercurial salts followed by a further reducing agent. The process in which bromide of copper is used, followed by the application of a solution of silver nitrate, may be included in this class, though it perhaps more properly deserves to be placed by itself, since it results in the addition to the image already existing of a certain quantity of fresh silver, in addition to copper, which silver, should the necessity still exist, is amenable to further treatment by any of the other methods where extreme density is required and the image permits it.

For comparatively slight intensification, especially in the case of wet-collodion negatives, nothing is easier, and at the same time, more effective, than a plain solution of one of the alkaline sulphides, either liver of sulphur, or, as we prefer, sulphide of ammonium. The latter is obtained in liquid form, and only requires to be mixed with water at the time of use, thus avoiding the necessity of making and keeping large quantities of the evil-smelling solution of potassium sulphide. In its concentrated form the ammonium sulphide is very powerful, and occupies but little space, and mixes instantly with water; and, although its odour is quite as unpleasant and

powerful as the other, it will be found a more convenient agent to use.

This treatment gives a tolerably wide range of effect in the case of negatives rich in silver—such, for instance, as wet-collodion plates in which the deposit is of metallic silver on the surface of the film; and with such plates, except in cases of very thin images, it will give all the density required. Provided the negative is perfectly clear in the lines and has been thoroughly washed, which is not a difficult condition to comply with in the case of collodion, there is no possibility of filling up the transparent parts of the image, for which reason this plan is preferred by many experienced workers.

With collodion emulsion or gelatine negatives the action of the sulphites is not so entirely satisfactory from the point of view of density, as, owing, no doubt, to a difference in the constitution of the deposit of silver forming the image, its action results more in a change of colour than an increase of opacity. The alteration of tone gives an idea of greater density to the eye, but too often the printing value of the negative is but little improved. With gelatine plates, too, the difficulty of entirely freeing the film from soluble matter, especially the last traces of hypo, renders the use of the sulphides rather risky; and this, combined with their uncertainty of result, scarcely recommends them under the circumstances.

Next in order may be mentioned the mercurial processes, of which the number is legion; but we need not here go deeply into the many complicated formulæ that have been introduced of late years, as these present no advantages except, perhaps, in the case of gelatine half-tone negatives. The old original method of bleaching with bichloride of mercury, followed by a second application, to again reduce the mercury and silver compound, into which the image is then converted, will answer all ordinary purposes, and it only remains to make a choice of reducing agents. Here, as always, the first condition is that the lines of the negative consist of clear glass, and that the plate is thoroughly washed; then there can be no question of the filling up of the lines or of the permanence of the image, while the degree of density will depend upon the agent used to darken the image.

For slight intensification nothing is better, and at the same time easier of application, than dilute ammonia, while, unless the original image be very thin, it will suffice, under most circumstances, to give the density requisite. Where the increase required is but very slight, a solution of sulphite of soda gives perhaps a clearer intensification, or the sulphite may be used in conjunction with a very small proportion of "hypo"—one or two grains to the ounce of solution—in which case the colour is of a more non-actinic nature.

For ordinary purposes there is no necessity to go further to find a suitable reducing agent; but, when considerable increase in opacity is requisite, it will be obtained by using Schlippe's salt or sulphantimoniate of sodium. With this reagent, the colour of the image varies from a scarlet to a yellowish-brown by transmitted light, and this, taken in conjunction with the opacity of the deposit, produces an image of the highest printing value from an originally thin deposit. As in the previous methods, if the negative is in a fit condition for treatment, there is no risk of filling up the clear lines, and, granted perfect washing, the image is quite permanent. Indeed, under proper conditions of manipulation, this process gives one of the most stable images we have ever met with.

Instead of Schlippe's salt, if that be not obtainable, sulphide of ammonium or potassium may be used after the mercury, in which case an image of the greatest opacity, but rather inclined to coarseness, results. For this reason it is only advisable to resort to this method with comparatively open subjects and thin images.

Where the original image is especially thin, no process belonging to these classes gives so satisfactory a result as that in which the image is first bleached with chloride of copper, and after very thorough washing is flooded with a solution of nitrate of silver. Under the latter treatment, the delicate white image formed by the copper solution is converted into one of intense blackness, the density and opacity depending in some measure upon the strength of the silver solution, which has been recommended as strong as 100 grains to the ounce, though this we regard as ridiculously too strong, thirty or forty being ample for most purposes. The copper solution may be cheaply made by dissolving equal parts of sulphate of copper and bromide of potassium in as small a quantity of hot water as will dissolve them, and diluting to a convenient strength for use.

According to Captain Abney, the image by this treatment derives an additional quantity of silver from the solution of nitrate, and this, it must be noted, in exact proportion to that already present, the action being a definite chemical one, and not a system of "piling on," as in the acid silver method. This fact, therefore, renders the copper method peculiarly suitable in cases where the original image is extremely thin, as, after treatment in the manner indicated, the image may be again submitted to the action of this or any of the other solutions, when the added silver becomes amenable to intensification. It has been stated that an image intensified with mercury may be subsequently further intensified with silver, but, so far as our own experience goes, the copper process is the only one that lends itself satisfactorily to subsequent treatment.

We have intentionally passed over the acid-silver method, because to practised wet-plate workers it will be sufficiently familiar, while there are difficulties which do not recommend it over those already mentioned where gelatine or collodion emulsion processes are employed. But, apart from the trouble involved in its use, we regard it as pre-eminently the best method of intensification under all circumstances where the negative is worth or fit for such treatment.

In conclusion, we would throw out a hint to wet-plate workers. The image formed by iron or pyro and silver is entirely on the surface of the film and is formed at the expense of silver thrown down from the developer, the metal contained in the film and upon which the light has acted being entirely removed and wasted in fixing. Why not utilise this silver for purposes of intensification by, instead of dissolving it out, reducing it by means of alkaline pyro or ferrous oxalate; in fact, why not reverse the ordinary routine of dry-plate development? In years gone by we have obtained very good experimental results in this way for half-tone, and we should consider the method better suited for process work.

Photographing the Human Voice.—At the recent meeting of the American Association, Messrs. Minckly and Hallock described a method (of which we hope later to be supplied with details) of photographing the vocal cords in action, and at the same time a method of voice analysis, which will enable a singer to see every tone in his voice.

The Fugacity or Otherwise of Coal-tar Dyes.—As these substances, both for colouring either finished prints or the albumen, gelatine, or collodion surface of the imprinted paper, are of considerable importance in photographic technics, interest will be felt in the report of the Committee appointed to examine the action of light on dyed colours, which was presented at the last meeting of the British Association. To summarise, it may be said that, as regards the popular idea that these dyes are fugacious, Professor Meldola, the President of the section, showed that, in the case of dyes from natural sources, some were fugitive and some fast, and that the same statement might be made of coal-tar colours, but that it was possible to select a larger number of fast dyes from the latter than the former kinds.

Formalin, or, as it is technically named, solution of formaldehyd, appears to be exciting some interest among chemists, and it may be well to point out how powerful a reducer they find it to be. The cogency of the warning already given in these pages as to the danger of using it for photographic gelatine films on paper or glass is thus intensified. It is no use to harden any such film until it is quite freed from the fixing solution, or any solution used as intensifier, &c., which contains a metallic salt. Under the signature of T. H. Lee there recently appeared in the *Chemical News* an article on *Some Reactions of Formaldehyd*, in which the effect on a well-known intensifier—alkaline mercuro-potassium iodide—is given. Even in the cold the mercury is reduced to the metallic state. The effect therefore on a negative so intensified may be readily imagined.

A New Powerful Reducing Agent.—At the British Association meeting, a paper possessing strong photographic interest was read by Mr. H. J. Horseman Fenton, M.A. By the mutual action, under certain conditions, of tartaric acid and a ferrous salt, a substance is produced which acts as a powerful reducing agent (and which gives a beautiful violet colour with ferric salts). The substance, after great difficulties surmounted, has been isolated, and proves to be a new acid. If moist ferrous tartrate be exposed to the air for a short time, a certain quantity of the new acid is produced, and may be indicated by the production of the violet colour above mentioned. The effect is much more intense if the exposure be made out of doors. At first this effect was set down to the action of some constituent of air, but later experiments showed light to be the active factor in bringing about the change. That oxygen, or some oxidising agent, however, is essential, is proved by the fact that even in bright sunlight exposure in a vacuum produces no result. There is thus seen the germ of a new developer, and a new light-sensitive agent.

The Incandescent Gaslight.—The time of short days and dull light is rapidly approaching, and photographers will be preparing as best they can to combat their difficulties. Where there is no electric light available, this form of illumination, which has advanced in public favour the last year or two "by leaps and bounds," will prove of inestimable service. We have some time ago pointed out its value and the economy of gas its use involves. Most persons would like to have some means of proving to their own satisfaction these two properties. This can be easily done without any apparatus beyond a piece of pencil. Let any one fit his gas bracket with a No. 3 Bray's burner and observe the light. Then let him place over such burner an incandescent burner and light it. Obviously no more gas will be used than the No. 3 permits, but it will be ample to permit the complete incandescence of the mantle. Conclusion first: the new burner need consume no more gas than a No. 3 Bray. So much for the economy. While this Welbach illuminant is burning let another bracket, some distance away and provided with a No. 6 Bray, be lighted, and a piece of white cardboard with a pencil held in its centre and at right angles to it be moved to and fro between the two lights till the two shadows cast by the pencil appear equally dark. Then let the distance from pencil to Welsbach be measured in inches and the measure squared; let the same be done with pencil and Bray burner. The two totals thus obtained give, with a fair approach to accuracy, the relative illuminating strength of the two burners. It will be found, roughly speaking, that the Welsbach burner gives three times the light of the other, and uses only half the amount of gas. It may be noted that comparatively lately the one item of expense, the mantle, has been reduced in price by one-half. One of our correspondents writes us that his first experience with this burner as a light for spotting prints by is amply verified by his later practice. With ordinary gaslight one-half the work had to be done again when the prints were looked over by daylight; but with the incandescent light no alteration whatever is needed. Two points may be dwelt upon. If the gas pressure is too strong, much more gas is used than is needed, and the light is not near so brilliant. Next, it will be desirable periodically to clear out the air inlets, which are apt to get choked with dust and small insects, such as gnats, &c., the light being greatly diminished under such conditions

JOTTINGS.

I AM always glad to have an opportunity of giving the other side of any question that I may discuss in these columns, and I therefore hasten to reproduce, from the current number of *Autotype Notes*, some remarks by Mr. W. S. Bird, in which he good-humouredly and fairly takes me to task in reference to my adverse criticisms, made a month or two ago, upon the new premises of the Royal Photographic Society.

Mr. Bird says: "The new quarters of the Society are found by the members who most use them to be both comfortable and efficient for the work and business to be done. Some few hostile comments have been made in the press on insufficient information. 'Cosmos,' of THE BRITISH JOURNAL OF PHOTOGRAPHY, was perhaps the earliest, the severest, the most important, and most erring critic. He paid a flying visit before the installation of the principal room was complete, and was evidently uncomfortable and disappointed. He probably concluded that, the principal room, and the Secretary's office adjoining, to represent the premises. No one can suspect 'Cosmos' of any hostile feeling towards the Society; quite the contrary. He was but tired, and premature in his judgment; also evidently unaware of the existence of the Council room on the first floor; a lofty, well-lighted, dignified apartment suitably furnished, and affording to the Council the comfort, convenience, and privacy required. This room, it is true, is for the service of the Council at the monthly meetings only, but, as it affords the exact accommodation required, it is sufficient. It is a room vastly superior for its purpose to any other occupied by it during the last twenty-five years. Probably 'Cosmos' failed also to visit the extensive basement, containing a well-fitted laboratory, the lavatory, and space enough to deal with and store all the cases of framed photographs that arrive for the Exhibitions. This convenience means restricting the charge of all exhibits to the direct care of the Society, and saving the considerable cost of agency hitherto incurred."

"'Cosmos' may, or may not, on his visit have seen," proceeds Mr. Bird, "the upper secretarial room, considered more or less private, but affording facilities for work to be done in quiet by either the Honorary or Assistant Secretary, or by any individual member requiring a special search through the library. The installation of the electric light is subsequent to the visit of 'Cosmos,' as is the arrangement of the library. Speaking generally, there can, I think, be no doubt that the active members of the Society find the present premises more commodious, better situated, and affording greater facilities for the work to be done, than was the case in Great Russell-street. The principal room at the old quarters had a reasonable amount of length and breadth, but failed in height; it was extremely difficult to ventilate in the winter, and to keep at an equable temperature. The library was small; the entrance was fairly good; the staircase exceedingly well built; but, oh, what a long way up! Junior members could mount the steps gaily, proud of lung and limb, but some seniors, no doubt, climbed like weary

pilgrims, seriously meditating by the way. It was the best home obtainable for the Society at the time."

Finally, "the rooms in Hanover-square afford more space and greater comfort; there is a happy freedom from all out-door noises, and I am sure the majority of active members congratulate themselves on the change. I grant that, while the principal room is well lighted from above, and the walls adorned with choice specimens of photographic art, the *tout ensemble* is a trifle dull. This sensation would disperse, perhaps, if the contents of the library shelves were visible. There is now an excellent collection of books, neatly bound and gilt lettered, but they are shut up in a series of dull closets, gems of learning imprisoned in the dark. Probably the panels of these cases can be cut out and fitted with glass. If not, let them be abolished altogether, and proper shelves provided, so that the presence of the collection may be seen and felt, 'Cosmos' be comforted, and the rest of the brethren content."

I thank Mr. Bird for his generous admission that no one can suspect me of any hostile feeling towards the Society. I esteem it a great privilege to have the opportunity of doing what little I can to further its interests. But my opinion of the new rooms was not, as he supposes, based upon the scanty evidence only obtainable on a flying visit. I spent two entire evenings there; I saw what other members saw on those occasions; and I said what many other members said about them. I was perfectly well aware of the existence of the Council room; and the electric light was in excellent working order while I was present. A further and more intimate acquaintance with the rooms, including the subterranean and upper-story premises, may cause me to modify my first impressions, and if that proves to be the case I shall not hesitate to say so; but, in the mean while, I see no reason to change my original views, in which I am backed up and supported to an extent which would probably surprise Mr. Bird, and others.

For the life, the well-being, and the progress of the Royal Photographic Society suitable premises are, as it were, its nitrogen and oxygen. If, as I respectfully submit is the case, the new premises are open to real objection, and likely to engender dissatisfaction, the sooner the fact is recognised, and we make up our minds that they are only of a temporary or makeshift character, the better for the future of the Society. The earlier we turn our minds towards the great question of a permanent home the nearer will be the time when we shall reach that eminently desirable goal. This is the one and sole object I have had in view in ventilating the subject, and for which alone I ask those with whom I have the misfortune to disagree with me to give me credit.

The two articles reprinted last week from the *Daily Chronicle* on the Salon and Royal Photographic Society's Exhibitions appeared at a psychological moment. The author is an artist of recognised ability and standing; he is also an art critic in, if I may use the term, a large way of business. I do not agree, and I am sure nobody agrees or sympathises, with the cheap display of savagery in which he indulges at the expense of photography; but I should like to know whether "G. D.," with whom I had an argument a few weeks ago over his aspirations for the higher non-photographic criticism, finds his yearnings satisfied by the *Chronicle* writer?

By the way, this same master of critical gibes and jeers might find it advantageous to cultivate at least an elementary acquaintance with photography. In another daily paper to which he contributes art criticisms he recently stated that a correspondent had informed him that he had succeeded in making paintings, &c., "stereoscopic." The critic confessed that he did not know what this was. I have my doubts whether this feat has really been achieved in the sense implied, but the more and more I read "art" criticisms of photographs the more and more I boil at the sham of the farce of sending men, self-confessedly ignorant of photography, to criticise exhibitions of photographs.

After last week's correspondence about M. Jarchy's baby portrait scheme I hope I have rendered it clear and manifest to my readers that I made no mistake in originally drawing attention to the subject. As the National Association of Professional Photographers is shortly to have a meeting in London, may I hope that that body will take cognisance of the correspondence? Now, friend O'Neill, here is your chance, ready cut and dried for you! COSMOS.

ROYAL PHOTOGRAPHIC SOCIETY.

THE PRESIDENT'S ANNUAL ADDRESS.

IF in most cases practice makes perfect, I am afraid the rule does not apply in the case of a Presidential Address. It is not easy to write such an address at all. It is still less easy to perform the task a second time after exhausting one's available resources in a first effort. The difficulty indeed affords an excellent argument in favour of the election of a new President every year, and on other grounds also there is something to be said for such a course. But, on the whole, I believe that the two-year period, a period upon which I think we have informally agreed as the most suitable, is really the best. If the office is annual, the holder has hardly time to familiarise himself with its duties before he is called upon to leave it. If the same person is re-elected year after year, so that the post becomes a permanent one, other difficulties arise. It has been said that the best form of human government is a benevolent despotism, but it makes great demands on the qualities of the despot, and, in the absence of an ideal one, human nature has in practice preferred to adopt other systems. A permanent president naturally becomes a despot, and after a while his subjects are apt to sigh for a change. Perhaps also some of them would like to try their hands at wielding the sceptre, and this feeling, which, after all, is a perfectly legitimate and reasonable one, tends to bring about a change of government.

In this Society, in the past, we have generally had long presidencies, and I cannot refer to the subject without a passing tribute of respect to the two men who practically occupied the chair for the first forty years of the Society's existence—Sir Frederick Pollock and Mr. James Glaisher. The first was unceasing in his devotion to the interests of the Society, while but for the second I do not believe that there would now be a Photographic Society of Great Britain at all. Still, I think I may take it that we have pretty generally agreed that the drawbacks of a permanent presidency outweigh its advantages, and I think I may further say that we are also of opinion that the proper term of office is two years. Captain Abney set an excellent example by retiring after two years' service, though, if ever there was anybody designated for the permanent leadership of our Society, he was that man. I am shortly about to follow his example, and I trust that the precedent thus created may be followed by our successors and by the Society in the future.

The same considerations which apply to the choice of a President apply also to a large extent to the election of the Members of Council. I do not propose to suggest any alteration in our existing system, but at the same time I wish to express the opinion that it does not provide sufficiently for the introduction of fresh blood. Faults can be found with all systems, but my own personal predilection favours one which compels the retirement of a certain number of the senior members each year. No doubt you lose the services occasionally of a useful man for a year, but he can come back after a year's absence, and you have a constant current of new members with new ideas, flowing through the Council. The action of an unchanging body is apt to get stereotyped. Under our system the natural tendency of the members of the Society is to vote for the Council as it stands, and so we get the same men re-elected year after year. However, the objection is not a very serious one, and as a matter of fact we have a very excellent Council at the present time. Perhaps it will be time enough to talk about altering our system when it produces bad results.

On an occasion like the present, the opening of a new session in our new abode, the thoughts naturally recur to the past history of the Society and to the many different localities in which it has carried on its work.*

For the first year of its existence the Society met in the rooms of the Society of Arts, but at the end of the year it took rooms for itself at

* At one time I had the idea of making this address a short history of the Society, but I was anticipated by the *Photogram* (a journal certainly deserving of a more euphonious title), which published in its number for August last a very well-written and judicious summary of our history. To this I would refer those interested in the subject and I may add that further details of the Society's early history will be found in the Report of the Jurors of the Photographic Section of the 1862 Exhibition, written by the late Dr. Diamond.

41, Regent-street (the numbering of the street has been altered since 1854, the original No. 41 was on the east side of Piccadilly-circus, apparently one of the blocks pulled down about ten years ago). A few years later (in 1857) the accommodation proving insufficient, it migrated to New Coventry-street, where it remained till 1860. The change to New Coventry-street involved a very considerable expenditure which it was found the funds of the Society could not support, and as a measure of economy a move was made to King's College. We may perhaps learn a lesson from the past experience of the Society for our future guidance. It was urged in 1857 that, if the Society possessed large and commodious premises, a considerable accession of new members might be expected and an increase in the wealth and popularity of the Society. Experience then and since goes, I think, to show that the use made by members of the Society's reading-room and library will always be limited, and that it would be unwise to devote too large a proportion of the Society's funds to the object of obtaining attractive premises. I do not wish to be misunderstood. I should like to see our meeting-room, our library, our Council room and offices as complete and convenient as they can be made, but I do not anticipate any great advantage from the addition of what is practically the club element. There already exists a most successful photographic club, the Camera Club, and I do not think that any advantage to the Society will arise from an attempt to rival that institution on its own lines.

At King's College the Society remained till 1867, when it moved to 9, Conduit-street. Here it remained till 1876, when straitened resources once more induced a move to the Gallery in Pall Mall. In 1890 the desire again arose for a meeting room, offices of its own, and a number of the members subscribed to a special fund for the purpose of covering the cost. The rooms at 50, Great Russell-street were taken, and there the Society remained till last June, when we entered on the occupation of these our new quarters. The move to Great Russell-street certainly gave the Society a fresh start. It has been more active and efficient since it left Pall Mall, and I am sure that the impetus thus given has since gained further force.

I do not look on this last move as a final one, though I do consider it one of great advantage to the Society. These rooms are distinctly an improvement on those we have left. They are more accessible and more convenient. We have a separate room for our Council meetings, and the offices are better. We may, I think, for the present rest and be thankful, but at the same time I hope we shall, during the next few years, accumulate a fund which will justify us in securing premises of a still more convenient character, including good library accommodation, space for our growing collection, and a larger room for our meetings than the one now available.

If the Society, however, shifted its quarters rather frequently, it has never intermitted either the regular publication of its *Journal*, or the holding of its Annual Exhibition. The *Journal* has varied something in style and character. It was, to begin with, more of a newspaper than it is now, but its journalistic features disappeared when the work was taken up and more efficiently performed by the photographic press.

The Exhibition has been held in various places—at the Gallery of the Society of British Artists in Suffolk-street; at the Society's rooms, in Coventry-street; at King's College; in the Gallery at Conduit-street; in the Gallery of the Royal Society of Water Colours in Pall Mall. In 1862 it was proposed to abandon the Exhibition (which was then held at the beginning of the year) in consequence of the death of the Prince Consort, but it was held at a later period. Since 1854 there has not a year passed without an Exhibition of our Society, and I hope it will be long before there is any break in our annual series.

I believe the Society is now more prosperous, and established on a firmer basis than at any time during the past thirty-five years. At the time of its first foundation photography was new and fashionable. Its real powers were unknown. More was expected of it than its then undeveloped capacities could provide. Naturally there came disappointment, and the supporters of the Society fell away. The advancement of the science was left in the hands of a few earnest workers, and only a few enthusiasts admitted the existence of a connexion between photography and art. As years went on, the workers developed the scientific powers, and the enthusiasts compelled the attention of the public to the artistic capacities of photography.

At the present day the followers of science avail themselves of its infinite resources and admit its value, while artists, if they hesitate to acknowledge their indebtedness, at all events make abundant use of it. It would be hard if the old Society, which has done so much to advance photography, were not to share in the prosperity it has helped to build up, nor do I think there is much reason to fear such a result. All the signs of a growing prosperity surround us. We are better off pecuniarily than we have been for many years. Our list of members has increased and is increasingly rapidly. The standard of our Exhibition is higher than ever, and it as fully represents the highest level which all the varied applications of photography have reached. We are, so far as can be judged, growing in public estimation. We have reorganized our constitution, and set it on which I hope is a firm basis. We are, I think, as energetic and as ready for work as ever we were, and, though where once we had the field to ourselves, we are now surrounded by a crowd of friendly rivals, we are, I think, strong enough to hold our own, and well able in the future as in the past to carry out the object of our foundation, the promotion of the pursuit with which we are associated. And now let me turn from the proceedings of our own Society to a brief—the briefest—glance at the photographic progress of the past year. There is not, it seems to me, very much to be said. The principal photographic event of the past year ought to have been the Exhibition which was held at the Imperial Institute, but unfortunately the attempt cannot be characterised as other than unsuccessful. An excellent collection of pictures was brought together, the scientific applications of photography were admirably illustrated, and there was a good representation of photo-mechanical processes. This, however, is all that can be said. In the important section of apparatus almost nothing was shown, the principal makers having taken exception to the conditions of the Exhibition, and having agreed not to take part in it. Little interest was taken in the Exhibition by the public, and the number of visitors to the galleries was, so far as my own observation goes, extremely small.

That so excellent an opportunity of holding a comprehensive Exhibition of photography has been lost must be a matter for regret to all who are interested in the subject, especially as the attempt will render any similar project more difficult of execution in the near future. Considering the number of visitors who attend our annual Exhibition, and the more recently established Exhibition of the Salon, and considering also the interest taken by a very large number of persons in the various minor exhibitions of photographic apparatus, it is difficult to understand why the larger Exhibition at South Kensington was not more successful. However, we can only regret the fact, and hope for better results when the next similar attempt is made.

I am not aware of any very notable instance of photographic progress during the past year which ought to be chronicled. The direction of our present progress is, I think, as it has been for some time past, towards facilitating the production of good work rather than towards the production of greatly improved results, or result of a very novel character. The multiplicity of photographic apparatus is so great that it is extremely difficult when, as so often happens, one is asked by a friend for advice in the selection of an outfit, to know what to recommend. However, most of it is so excellent that whatever you recommend will probably justify your choice. Indeed, on several occasions it has happened to me to be thanked for advice and assistance the tenor of which I had entirely forgotten.

In photographic optics, the progress to which I referred briefly in my address last year still continues. The lens for which a medal has been awarded to Messrs. Taylor, Taylor, & Hobson, is not merely an improvement on an existing type, but is in itself constructed on new principles. Mr. Dallmeyer's adaptation of his tele-photographic lens to portraiture should also be mentioned.

I do not think we have any new processes to speak of. The production alike of plates and of printing papers has long since passed from the laboratory to the factory, and, indeed, much of the interest attached to the amateur pursuit of photography has passed away with the changed conditions—but this is a very old story. The commercial production of gelatine printing papers, alike of those in which the image is produced by development and of those in which it is printed out, has made some progress. It would, I think, be interesting if we could obtain trustworthy statistics as to the comparative amount used of albumen and gelatine papers and also of the proportions in which platinum and carbon are employed. Probably they would be very difficult to obtain.

Dr. Joly's method of producing pictures in colours, shown last June to the Royal Society, is certainly one of very great interest and ingenuity. As to the originality of the device I do not think there can be any question. As to its value we may perhaps be permitted to postpone any expression of opinion until we have further information before us. I hope Dr. Joly will be able to bring full details of his method before the Society during this session, and we shall then be able to discuss it.

The photo-mechanical branch of our science is rapidly extending, and I am sure the Society has acted wisely in devoting a definite proportion of its meetings to the discussions of subjects connected with it. Distinct and regular improvement is noticeable both in blocks for relief printing and in photogravure plates. The demand for good process

work is certainly extending. Whether the same can be said as regards the best photogravure work I am not so sure. I think there are indications that the public is inclined to tire of photogravure, which it regards as mechanical, and as lacking artistic individuality. I cannot quite follow the reasoning which leads to this conclusion as applied to reproductions of pictures, but I am inclined to think that fashion is setting in that direction.

The photographic reproductions in our best magazines and journals are as good as need be desired, and, this being so we are, I think, justified in protesting against the vile pictures frequently used for book illustration. I could name half a dozen recent books of travel which are thus defaced. No doubt the fault often lies with the original negative, and in that case we may accept literal accuracy instead of artistic merit, but I could name several instances in which the blocks have been made, not from original photographs, but from wash drawings. In such cases the publisher could only plead cheapness as his excuse, a plea which ought never to be admitted.

In connexion with the subject of photogravure, I should like to refer to the effort made by the Society of Arts to encourage the progress of the art in this country. Artists are always complaining that, to get their pictures reproduced, they have to send them to Berlin or Paris, that they cannot get satisfactory work done in England. To test the accuracy of this statement, the Society of Arts offered prizes for the best reproduction in photogravure of Mulready's well-known picture, *Choosing the Wedding Gown*. As to the artistic merits of this picture there may be various opinions, but there can be no question as to its suitability for testing the process. It includes a great variety of different colours, and different shades of the same colour, the translation of which into gradations of black and white giving amounts of light and shade corresponding to the light values of the different tints is a task of the highest difficulty. How difficult it is may be estimated from the fact that a comparison of the photographs with a good steel engraving of the picture showed that in many instances the photographs were much more correct than the result which satisfied the eye of the engraver.

By far the larger proportion of the competing plates showed high merit, and there were at least half a dozen which might certainly be considered as satisfying the reasonable demands of the artist. It is to be noted that all hand-work was excluded, the object being to ascertain how far a faithful reproduction could be obtained by purely mechanical means. After the successful results of this competition, I trust that we shall hear less of the superiority of foreign work, and that English artists will in future give English photographers an opportunity of reproducing their pictures if they want them reproduced.

LABORATORY NOTES AND NOTIONS.

Recovery of Waste.—Much has been written on the subject of saving and recovery of waste silver, occurring either in solution or as a precipitate. This is an operation which seems to become more and more neglected as modern processes in photography have superseded the older ones. When the purchase of silver nitrate formed a considerable item in the expenditure incurred, it was the custom, far more than now is the case, to employ every care to recover as much as possible from the various solutions containing it. As the dry plate and ready-sensitised paper came into use, this precaution fell into disuse, except perhaps in a few of the larger establishments, and it is too generally the case that many solutions containing silver are allowed to run down the sewers. It would be an interesting piece of information, were it possible to arrive at it, to learn how much of the enormous amount of silver annually consumed by our manufacturers is recovered, and how much is totally wasted. I fancy it would be a surprise to every one. Take the negative fixing bath as an instance. How many photographers ever take the trouble to recover the silver from the hypo, and yet this is perhaps the greatest source of waste which occurs in the photographer's laboratory. According to the published researches of Messrs. Haddon and Grundy, each quarter-plate contains on an average 1·027 of metallic silver. This gives roughly twelve and a half grains to the dozen, and about thirty grains to the dozen half-plates. Of course, some of this silver remains to form the negative, but it would not be too much to say that fully seventy-five per cent. goes into the hypo. A simple calculation shows that about 270 grains of metallic silver will be in the hypo solution for every gross of half-plates fixed, and, to a less extent, the same may be said of the fixing bath employed for paper prints and enlargements. Surely this is worth while paying attention to, and this leakage of profit put an end to.

Emulsion-makers, whether engaged commercially or merely as experimenters, frequently have accumulations of emulsions which are unsatisfactory from one cause or another, and the recovery of the silver is a matter of no small difficulty. The methods usually given of boiling, precipitating, and drying before sending to the refiners are both troublesome and unsatisfactory, and consequently the necessary operations are put off from day to day, and ultimately perhaps the whole thrown away. This is a pity, when there is a simple and easy method of recovering the silver in a perfectly pure state, and involving only the crudest appliances, and, although by no means new, yet seems to be, in this connexion at least, completely overlooked. I refer to the electro deposition of the silver by a feeble current from a battery, or, rather, from a single porous cell. To illustrate the method, I will describe an experiment recently tried. A quantity of gelatine emulsion which had accumulated from various batches, and which contained twenty grains of silver nitrate to each ounce, made into bromide in the usual way, was all melted and emptied into an earthenware jar. The quantity was about forty ounces, and therefore contained the equivalent of 800 grains of silver nitrate. Whilst still melted, lump cyanide of potassium was added, and dissolved, with frequent stirring, until the whole of the bromide was dissolved and the solution was quite clear. A porous cell, such as may be obtained at any electrician's, and of suitable size to go into the jar, was placed in it, and filled up to the level of the solution with dilute hydrochloric acid. A piece of zinc, with copper wire attached, was ready, and to the wire was secured, by melting, a small plate of wax, one side of which was covered with a fine coating of plumbago. The zinc was immersed in the porous cell, and the wax in the silvering solution, and the whole allowed to remain, with just an occasional stir, for some days, when a plate of pure silver was deposited upon the wax, which, on weighing, proved to be over 400 grains. Allowing a margin for error, and for interrupting the process before it was completed, this was a nearly theoretical yield, and the trouble almost nil.

To see whether hypo would do as well, an old negative-fixing bath, which was nearly saturated and was quite black with constant use, was filtered through fine calico, and the same method of deposition was tried, and with equal success, a thin, bright plate of silver being deposited on the wax plate. No special care is needed, and only an occasional rub to the zinc plate, and the renewal of the acid solution, and the operation is a continuous one. If a strong solution of ammonium chloride, or even of common salt, was employed in the porous cell instead of the acid, there is no reason why a permanent arrangement for the recovery of waste should not be fixed up in every photographic laboratory. By exercising more care in keeping the silver solutions clear and free from sediment, the domestic spoons and forks may replace the wax plate and receive a good coating of silver. The superficial surface of the zinc should not exceed the surface to be deposited upon, but even in this a wide margin is allowable.

Collodion Emulsions.—The principal complaint made against collodion emulsion, and the one which militates most against its general adoption, is the lack of sensitiveness to weaker light. In copying, for instance, where a comparatively small illuminated area is to be reproduced, and the lens is stopped down to *f*-16, or smaller, the exposure has to be so very prolonged that it is almost out of the question to employ it. In a strong light, or for landscape work, collodion emulsion is quicker than wet collodion, but the reverse is the case in weakly illuminated subjects, or in a bad light. This is undoubtedly a great drawback. There are several reasons assigned for the slowness of collodion as compared with gelatine, but I think the principal reason will be found to be the necessary introduction of the NO_2 group into the cellulose in making pyroxyline. Gelatine does not contain this group, but rather the NH group, as evidenced by the ammonia disengaged during decomposition. Thinking over this, I recently tried whether it was possible to remedy this by adding the NH_2 group to a collodion emulsion. A good sample of washed collodion emulsion was taken, and to each ounce five grains of hydroxylamine hydrochloride was added. When dissolved, the emulsion was heated to nearly the boiling point, taking care to provide against loss of the ether solvent. A plate was then coated, washed, and exposed. On development, no improvement in sensitiveness could be found. The preliminary washing had removed the hydroxylamine sensitiser. Nor was a plate which was coated and exposed at once without washing found to be any quicker. Evidently nothing was gained by this addition as far as sensitiveness was concerned. A plate was then tried, and, without washing, a solution of one grain per ounce of sodium hydrate in methylated alcohol was

flowed over the plate previous to exposure. The rapidity was now increased enormously, a well-lighted object in black and white being fully exposed in thirty seconds, which previously took four minutes.

As, however, washed emulsion is very troublesome to prepare, involving, as it does, a great deal of time and care, besides waste of solvents from the necessary evaporation, I tried to make an emulsion containing hydroxylamine as a by-product, and so do away with the tedious washing, drying, and redissolving. About sixty grains of hydroxylamine hydrochloride were dissolved in methylated alcohol and the basic hydroxylamine obtained by sodium methylate, as previously described in "Laboratory Notes." This was carefully neutralised with hydrobromic acid and evaporated to dryness over the water bath. The resulting bromide was dissolved in alcohol and made into three ounces of collodion. Another three ounces of collodion was made with the equivalent quantity of silver, and the two were mixed. An exceedingly fine emulsion of silver bromide was formed, with hydroxylamine nitrate as a by-product. Care was taken not to have an excess of silver nitrate present, which would have been reduced by the hydroxylamine. After due ripening had taken place, the emulsion was tried in the ordinary way by being washed before exposure, and was found fairly rapid, but the gain not sufficient to compensate for the extra trouble required to make the bromide. With the alkali, however, the result was all that could be desired—working clean, vigorous, and the nearest approach to gelatine I have ever met with in collodion. A much simpler and easier method of making the hydroxylamine bromide is to take the sulphate of this salt, dissolve in alcohol, and add an alcoholic solution of barium bromide as long as a precipitate of sulphate of barium is thrown down. The solution then only needs filtering to be fit for use in making the collodion. The best results with this emulsion were obtained by flowing on to the plate, after coating and without washing, the following solution:—

Potassium hydrate	10 grains.
Methylated alcohol	10 ounces.
Glycerine	½ ounce.

Just enough to cover the plate is flowed over after the collodion is set, and at once placed in the dark slide for exposure. A distinct trace of the image is often visible on taking out of the dark slide.

What is a Developer?—Most of your readers will remember an amusing hoax which was perpetrated by some evil-disposed person upon a contemporary about two years ago. It purported to be an account of the opening of a new society, and the Chairman, a Dr. Burton Coxe, gave his experience with a new developer he had discovered, and which had the somewhat formidable name of "hydroxylmonohydride." The point of the joke was that, under this high-sounding name was concealed the simple fluid which makes whisky so strong when you don't put any in. But I have often had a notion that the worthy mythical doctor was not so wide of the mark, and that he had unintentionally described our only developer,—

> "Full many a shaft at random sent
> Finds mark the archer never meant."

Let any one try the following simple experiment. Take a plate of copper, such as is used for engraving or photo-mechanical purposes, and coat the surface by electro-deposition with a thin coating of silver. Now coat this with emulsion, either collodion or gelatine, and expose as usual in the camera. If developed in the ordinary way, a perfect picture will be obtained if all is in working order; but, if instead of employing a developer, the plate is immersed in pure water, and a plate of zinc also immersed and allowed to touch the copper, the image is at once developed so far as to be perfectly visible, but thin. After this no further development takes place, because the liberated bromine from the reduced silver has united with the hydrogen from the water and formed hydrobromic acid. Now take out of the water and wash well, and repeat the operation in fresh water, and a still further development will take place. By repeating this a good many times, full development will be attained without any of the recognised organic or inorganic developers, and water only is the agent in this case. Repeat the operation on a fresh plate, and add a drop or two of ammonia or other alkali to the water to neutralise the hydrobromic acid formed, and development will proceed steadily on until completion, when the unexposed silver bromide will also be reduced, precisely as in the case of over-development with pyro or any other agent. If the zinc plate be placed in a porous cell, as described above in the paragraph on silver-waste recovery, the operation is much more successful, and the water, after development, gives, with silver nitrate, a precipitate of silver bromide. The only difference in development is that with pure water the image is brought out as pure metallic silver with a silvery white colour, and not black, as is usually the case. If stripped from the metal plate, it will be found to be clean and vigorous, and, except in colour, indistinguishable from other negatives.

The explanation of this is that a feeble current of electricity is formed by the contact of the silvered copper and the zinc. The molecules of water become polarised in this current, presenting the hydrogen element to the silver pole, and the oxygen to the zinc. The hydrogen in its nascent condition unites with the bromine of the silver haloid to form hydrobromic acid, and at the same time a corresponding atom of oxygen is liberated at the opposite pole, which unites with the zinc to form zinc oxide. If sufficient alkali is present to neutralise the hydrobromic acid, the action is continuous. The silver haloid is thus reduced to metal, and the zinc proportionately oxydised. This is precisely what takes place in ordinary development; the silver is reduced, and the pyro or other agent oxydised. Is it, then, strictly accurate to call pyro a developer? We could, with just as much accuracy, describe zinc as such. Nor would it be any more scientifically accurate to say electricity was the developer, since the reaction is the result only of the water decomposition, and the current the means of producing it. In ordinary development, then, the zinc is replaced by pyro or other compound, containing hydrogen atoms so placed as to readily absorb the oxygen of the polarised water molecule, whilst the hydrogen of the water reduces the silver bromide. Those molecules of silver bromide which have already been partially reduced by exposure to light being the least stable are completely reduced first, and afterwards the electrolytic energy is expended upon the unchanged silver bromide. The above experiment, at any rate, seems to show that the water is the actual developer, and our numerous so-called developers, the oxidisable pole of a feeble electric battery, formed by the hydrogen atom of a carbon or nitrogen nucleus on the one side, and the partially reduced molecule of silver bromide on the other.

The experiment described still further illustrates this idea if varied as follows, and for this purpose a good sample of a washed collodion emulsion was employed. A silvered copper plate was coated, immersed in water, and exposed whilst wet to a well-lighted landscape. In a clean, new porous cell was placed a solution of pyro, three grains to the ounce of water, and ten grains of sodium sulphite to act as a preservative. This was placed in a porcelain jar, and water containing a few drops of ammonia so that the height of the two liquids corresponded. The exposed plate was placed in the outer jar of alkaline water, and one end of a ribbon of copper, about an inch wide, was clipped to the copper by a wooden clip, and the other end allowed to dip into the porous cell containing the pyro. After a while the image appeared, and, though in this case some hours elapsed, yet development ultimately took place equal to that with the zinc element, and yet no trace of the pyro had touched the plate, or was to be found in the alkaline water.

Sensitiveness of the Silver Haloids.—In the issue of The British Journal of Photography for August 2, an editorial article described a means by which dry plates might be prepared in daylight up to a certain point. It might perhaps save some experimentalists from trouble if a slight error were pointed out. The article describes the method of coating a plate with collodion, sensitising, washing, and placing into a solution of an iodide to convert all the silver into iodide, and states that a bromide or chloride will answer as well. It is well known that iodide of silver, prepared with excess of iodide of potassium or any other iodide, is perfectly insensitive to light, but silver iodide is the only haloid salt of silver possessing this property. Bromide or chloride are sensitive, prepared with excess of alkaline haloids, and, not only so, it will be found that the presence of a silver bromide or chloride will sensitise an otherwise insensitive silver iodide. True the sensitiveness is not very great, not approaching that conferred by tannin or a solution of silver nitrate, but it is sufficient to fog the plate if prepared by diffused daylight. If a washed and perfectly insensitive emulsion of silver iodide be formed in collodion, a very slight addition of collodio-chloride or bromide renders the whole sensitive. Here the bromide or chloride acts as an iodine absorbent, and so acts in the same manner as a silver nitrate, but, of course, in a lesser degree.

Edwin Banks.

METHOD IN PHOTOGRAPHY.*

When you enter the dark room of many establishments, you must prepare for surprises. The funniest part of it all is that you never know whence these surprises are to come, or just exactly what they are to consist of. Thus, I remember a certain party who once asked me to turn to the right as I entered his dark room; and I did so with most disastrous results. There happened to be an old camera there, for what purpose I never could quite understand, and on the other side a collection of empty boxes and large negatives. Where I couldn't kick holes in the boxes, I certainly succeeded with the negatives; and I have money to wager that the camera had to have a new bellows before it could ever again be of any practical use. The whole trouble arose from the fact that, when the photographer said, "Turn to the right," he really meant "turn to the left," but I wasn't a mind-reader in those days.

A dark room should be just as respectable and orderly as a reception room, and there is no reason why it should ever be different. As this necessary adjunct of our business, or profession, is usually the first place to which any person in the same line is conducted, I can truthfully say that I have simply been astounded at the conglomeration of articles I have seen in them, ranging from old shoes and cast-off clothing into tin cans, empty bottles, chemicals in bottles, chemicals in bulk, chemicals lying loose, chemicals on the floor and in every other place where they ought not to be, and so on, into liniments, cough medicines and, yea, even into the amber-coloured fluid with which some photographers are wont to toy, but which I've always been afraid to touch in those places for fear it might be an old pyro stock solution. Really, there is no excuse for all this. Method is as absolutely necessary in the dark room as elsewhere. There is always some nook or corner where the stock of chemicals can be neatly stored, properly labelled and ready for use. The dark room is no place for them. All you need there is what is absolutely necessary to develop and fix your plates with, and nothing more save the plates you use. Even these latter should be limited in quantity so as to be just sufficient for one's needs, for no plate on earth was ever made, or ever will be made, that will stand the damp, humid air of such a place as that in which you would not work a second were it not impossible for you to evade it.

When we enter the printing room we are appalled with what we usually behold. The floor is littered up with old paper, negatives are piled around in reckless confusion and in a manner not only absolutely devoid of any system, but with an utter disregard of the fact that dust does not improve them. Printing frames surround you on all sides, right and left, top and bottom; some are clean—but not often—others grimy and dirty that they give you the horrors to touch them. I have in my mind's eye a certain gallery in New England where the printing room is ever devoid of a scrap of paper or a spoiled print.

Really, now, isn't it less trouble to throw the scraps into some receptacle, and thus get rid of them at once, than to cast them on the floor and then have to devote good time to sweeping them up again? As plates come to the photographer packed in nice, clean boxes, why should they not go back into the same containers after they are finished? If they survived time in that condition when in an unfinished state, would they not keep indefinitely when chemistry had completed its allotted task?

In every branch of our business we need method, and in none to a greater extent than in the matter of economy. More money can be wasted in a gallery than is ever made. I have gone the length and breadth of this land and seen thousands of card mounts that never saw a print, yet are useless. Where the waste is elsewhere, even the imagination stops. In large establishments the money needed to employ a regular stock clerk who would be held accountable for his trust would pay a golden interest.

On the other hand, the smaller man who cannot afford a dollar or two for the wood necessary for a closet had better get out of the profession, for he can never hope to succeed in it when he is wasteful.

Method is what we want everywhere. Photography is branching out into side lines, gift enterprises, even babies' days, so that we can hope to expect, from present indications, something like—"On Monday a special drive in Paris panels—better value for the money than ever before offered." While I am strictly in favour of confining the business within its legitimate bounds, I cannot but admire the enterprise of a Nova Scotia photographer, who advertises: "Babies reduced to $2 per dozen."

What we want is method. Work should be turned out when promised. Cloudy days will ever come, but they have never yet arrived with the precision that photographers lay claim to. Let the business be methodical—work it on the same basis as other businesses are conducted, and the rain will be in the shape of something tangible.

What we want is method! WILLIAM F. MILLER.

* Concluded from page 634.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

REPORT of the Sub-Committee appointed to draw up Regulations concerning Grants in aid of Original Researches.

Your Sub-Committee has carefully considered this question, and recommends:—

(A) That the Grants should be made to individuals, in accordance with the practice of the Chemical and Royal Societies, and that the formation of a Committee should not be required.

(B) That applications for Grants should be considered by a special "Research Grants Sub-Committee" appointed by the Council and intrusted with executive powers.

(C) That, whilst each application must be considered on its merits, the following rules should be laid down:—

(1) An applicant for a Research Grant must present (*a*) a concise statement of the general nature of the proposed investigation and its object, with an abstract of any results that have already been obtained, and (*b*) a general statement of the way in which it is proposed to expend the Grant.

(2) A Grant must not be expended on the purchase of permanent pieces of apparatus except by special permission of the Research Grants Sub-Committee.

(3) The receiver of a Grant must make a general report of expenditure either at the end of or during the progress of the Research, and shall then be entitled to receive either the whole grant or such part of it as may have been actually expended.

(4) The receiver of a Grant must present a full Report on his investigation at the first meeting of the Convention after the Research is finished, and an interim report at any intervening meeting. If necessary, in order to secure priority of discovery or invention, the result may at once be published by communication to such recognised national, scientific, or photographic society as the Research Grants Sub-Committee may decide.

The Research Grants Sub-Committee appointed consists of Messrs. Haddon, H. M. Hastings, Andrew Pringle, C. H. Bothamley, and Wm. Taylor.

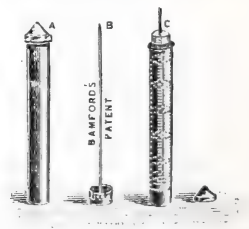
Our Editorial Table.

THE PERFECTION LIME CASE.

J. W. Bamford's Executors, 242, Yorkshire-street, Rochdale.

THIS handy little lime-holder has many features that should commend it to lanternists. Its uses and action, shown in the illustration, are thus described:—

A shows it closed with a new design of metal cap, which, being six-sided, prevents the case from rolling when placed in a horizontal position. B shows the holder, by the point of which the lime dust is removed from the hole in the lime, thus leaving it clean and ready for use. C shows the holder inside the case, with the limes threaded upon it, and drawn up ready for taking off a lime.



When in use the case will not roll off a table, hence breaking of limes from this cause is prevented. It is adapted for either large or small limes. The limes, being threaded on a wire holder, are rendered free from lime dust, thus avoiding the nuisance of having to pierce them when wanted. By this method of storing the limes are not only kept perfectly dry, but are less liable to become damaged. A single lime may be removed from the case without disturbing the relative position of any of the others; prevents the hands and clothing of the lanternist becoming soiled with lime dust.

Lanternists will certainly appreciate the "Perfection" lime case, which, to hold six limes, sells at 2*s.* 6*d.*

PHOTOGRAPHY: ARTISTIC AND SCIENTIFIC.

By R. JOHNSON and A. B. CHATWOOD. London: Downey & Co., York-street, Covent Garden.

NOT the least valuable feature of this book will be found in its illustrations, among these being a series, from half-tone blocks, very instructively pointing the authors' remarks in Chapter III. on "Composition of Landscape," from which the photographic aspirant will learn much to guide him in the selection of his subject. Correct, under, and over-exposure; results on orthochromatic and ordinary plates; lighting and posing; retouching, and distortion, are also dealt with by the aid of explanatory illustrations, of which in all there are fifty-six of very good quality.

The work opens with a chapter on the chemistry of "photo" (why

"photo?") processes, which is far too brief to be of very great use, although it may serve the purpose of an introduction, a remark which also applies to the next chapter, that on apparatus, lenses, cameras, and tripods. Exposure and development are more fully and minutely dealt with, and, as we have already inferred, the chapters on portraiture and retouching are likely to be greatly appreciated; they are evidently the outcome of much practical knowledge and experience. Printing, enamelling, and enlarging, finishing, and colouring occupy the concluding portion of the book.

The authors have evidently aimed to make the work clear and intelligible to the reader having no prior knowledge of photography, and in this they have most probably succeeded. Such a one taking up the book, and steadily following it through its 240 pages, would no doubt acquire a fair practical knowledge of photography. But in future editions, which we hope will be called for, we would suggest that the introductory chapters be amplified. It is a handsomely printed and got-up volume.

News and Notes.

MESSRS. GEO. GILL & SONS have removed their magic-lantern screen manufactory to 63, Charterhouse-street, E.C.

ASSOCIATION BELGE DE PHOTOGRAPHIE.—The second Exhibition of artistic photography will be held from January 15, to February 15, 1896, at Brussels.

MR. WILFRED EMERY, of 8, Dyne-road, Brondesbury, has shown us specimens of portraiture produced by transferring a carbon image to ivory and tinting it in colour. The results are of a very artistic and effective character, and favourably compare in appearance with high-class miniatures.

THE HACKNEY EXHIBITION.—The Hackney Society will send for, and convey to their Exhibition, any picture exhibited at Pall Mall or the Salon which may be entered for the Hackney Exhibition. Forms are now ready and obtainable of the Hon. Secretary, W. F. Fenton-Jones, 12, King Edward-road, Hackney.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, October 16. Mr. W. D. Welford will read an original paper entitled *Some Idle Thoughts on Photographic Societies.* Visitors are always welcomed by the members.

THE Gem Dry Plate Company announce that in future the prices of their Meteor dry plates will be: ¼, 1*s.*; 5×4, 1*s.* 7*d.*; ½, 2*s.* 3*d.*; whole, 4*s.* 3*d.*; 10×8, 7*s.* 3*d.*; 12×10, 10*s.* 6*d.*; 15×12, 18*s.* per dozen. The prices of the Universal, Process, and Lantern plates will be: ¼, 1*s.*; 5×4, 1*s.* 6*d.*; ½, 2*s.*; whole, 4*s.*; 10×8, 7*s.*; 12×10, 10*s.*; 15×12, 17*s.* per dozen.

THE Society of Photo-etchers will hold their Annual Photographic and Process Exhibition at 23, Baker-street, W., in October. Members, artists, photographers, and etchers are invited to send specimens of drawings for reproduction, general photography, photo-mechanical poocesses. Last receiving day, October 15. All particulars to be obtained of the Secretary, Arthur Vokins, 23, Baker-street, W.

MR. W. WATSON, of 35, Danbury-street, Islington, N., writes: "October 1, 1895. I beg to inform you that the partnership between Mr. Francis Holmes and myself has been dissolved by mutual consent, as announced in the *London Gazette*, dated September 6. It is my intention to continue the business under the style of W. Watson & Co., and I trust you may be pleased to favour me with your kind support. My best endeavours will be given to carry out any business you may intrust to me to your entire satisfaction."

COMMENCING with the October issue, which will be the first of a new volume, the number of pages of *The Studio* (5, Henrietta-street, Covent Garden, London) will be permanently increased in order to carry out the editor's intention of further enlarging the scope of the magazine. Amongst other matters of importance and interest in the new number, Professor Herkomer's famous Art School at Bushey will be dealt with in a special article, fully illustrated with reproductions of the pupils' work. Included in the supplemental illustrations given away with this number will be a drawing in colours by Aubrey Beardsley.

THE ACETYLENE FLAME AS A WORKING STANDARD OF LIGHT.—M. Violle, of Paris, whose standard light obtained from a given area of platinum at the point of fusion is well known, suggests that the acetylene flame may be a good working standard of light for general use, the platinum standard being essentially a reference or laboratory standard only adapted for occasional use. The acetylene flame is, if the gas is burned under moderate pressure, and with a proper supply of air, not only very white and luminous, but, what is more important, uniformly luminous over a considerable area.—*Thomas Bolas in "The Photographic Times."*

THE ILLUMINANT OF THE FUTURE.—Messrs. Sharp & Hitchmough write to the *Liverpool Echo*: "Sir,—We noticed with interest last evening an article in the *Echo* on the new gas, 'Acetylene.' As the above is causing a great sensation in scientific circles, and was the subject of the opening lecture with practical demonstration by Mr. E. Banks, at the School of Science last evening, resulting from experiments which have been made during the last few weeks, we are pleased to inform you that we have the calcium carbide and apparatus for generating the gas, and will willingly show the operation of making and burning to any one who is interested in the subject, as we believe we are the only people in Liverpool who have a sample of the chemical."

DEATH OF MR. CHARLES WHITING.—We are sorry to learn of the death of Mr. Charles Whiting, which took place on October 6. The cause of death was tumour, from which he had been suffering since last Easter, enduring great agony nearly the whole time. He will be remembered amongst photographers as being the instructor in wet-plate photography at the Regent-street Polytechnic, and also as being one of the founders of the West London Society, of which Society he was also a Vice-President. For nearly twenty years he had been connected with the Woodbury Company as chief operator. His loss will be received with regret by numerous photographers whom he has helped to become successful in their work, as he always took the greatest pleasure in giving instruction to all who needed it. He was a member of the Ealing Photographic Society at the time of his death, and was a most accomplished photographer, being a frequent contributor to the various Exhibitions.

THE HACKNEY PHOTOGRAPHIC SOCIETY'S ANNUAL EXHIBITION.—The Annual Exhibition of this Society will be opened on November 19, at 7.30, the succeeding days at 12 noon till 10 p.m., the prices of admission each day will be between 12 and 5.30, 6*d.*, afterwards 1*s.*, and arrangements will also be made for continued instrumental concerts of a high-class character, lantern displays, &c. The Judges will be Messrs. Valentine Blanchard, H. Chapman Jones, A. Horsley-Hinton, and Judge for position on screens, Mr. Alexander Mackie. Classes:—Members: Class A, any picture taken since last Exhibition; Class B, pictures taken during membership; Class C, for members who previously have not taken an award; Class D, best picture taken in hand camera (not enlarged); Class E, stereoscopic—set of six (prints or transparencies); Class F, set of four lantern slides. Open Classes (entries in these classes may be priced for sale at the option of the exhibitor): Class G, for any picture not previously having received an award, inclusive of portraiture and *genre* (in this class the work may be that of a firm, and need not be that of the exhibitor alone); Class H (Champion Class), for pictures which *have* previously received awards; Class I, for four lantern slides *not* having previously received awards. Awards: Gold medal in Members' Classes for best picture; gold medal in Champion (open) Class; silver and bronze in each of the other classes, but more medals or certificates will be given for exhibits if deemed worthy by the Judges (who have power to give or withhold any award). The Exhibition will be opened on Tuesday, November 19, by the Earl of Crawford, supported by the President, Mr. E. J. Wall. Extra entry forms, and all further information respecting Exhibition, can be obtained from W. Fenton-Jones, Hon. Secretary, 12, King Edward-road, Hackney, N.E.

RECENT PATENTS

APPLICATIONS FOR PATENTS.

No. 18,214.—"Stereoscopic Attachment to Single-lens Cameras." S. G. BROWN.—*Dated October*, 1895.

No. 18,279.—"Improvement in Appliances for Holding Cards, Photographs, and the like in their Position for Sale." G. W. HUGHES.—*Dated October*, 1895.

No. 18,611.—"Improvements in Frames for Holding Photos and suchlike." M. HENDERSON.—*Dated October*, 1895.

No. 18,695.—"An Improved Photographic Camera." H. JOLY.—*Dated October* 1895.

PATENTS COMPLETED.

AN IMPROVED HAND CAMERA.

No. 20,768. ALEXANDER JAMES JONES and SAMUEL JOSEPH LEVI, 71, Farringdon-road, Holborn.—*September 7*, 1895.

THE object of our invention is a hand camera that shall be compact, efficient, and always ready for use, We construct a box which forms the body of the camera, the front of which falls down and is retained in position by struts or other suitable means. The front, to carry the lens, shutter, and bellows, is fixed on to a block, which slides along a pair of metal runners, fitted into the falling front. This block is furnished at its sides with a pair of angle pieces to engage in the runners.

A metal frame with its lower portion in the shape of a cam or eccentric is fitted through the block, and so arranged that it can be drawn over and cause the block to be gripped tight when necessary.

Space is provided at the back of the body for a dark slide and focussing screen with a small door at the side to insert same. We further place on the top or side of the camera body, and forming part of itself, a second box, or compartment, with a lid, to contain extra slides.

At the back of the camera body we make another door hinged at the top to enable the focussing screen to be seen. This is furnished with a spring at the hinge to open it automatically and a suitable stop or bottom to retain it closed.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
14	Camera Club	
14	Lantern Society	
14	Norfolk and Norwich	
14	North Middlesex	
14	Oxford Camera Club	Discussion on Barnet Paper.
14	Richmond	
15	Birmingham Photo. Society	*The Construction and Uses of Lenses.* Edwin Underwood.
15	Brixton and Clapham	
15	Derby	
15	Exeter	
15	Hackney	
15	Handsworth	Council Meeting.
15	Hastings and St. Leonards	
15	Keighley and District	
15	North London	
15	Paisley	
15	Putney	*Through Lakeland with a Camera.* John A. Hodges.
16	Brechin	
16	Bury	
16	Croydon Camera Club	*Enlarging by Means of Incandescent Gas.* John A. Hodges, F.R.P.S.
16	Leytonstone	Discussion and Practical Demonstration on Uranium Intensifying, Reducing, and Toning. Messrs. Cricks and Harwood.
16	Manchester Camera Club	
16	Photographic Club	*Some Idle Thoughts on Photographic Societies.* W. D. Welford.
16	Southsea	
17	Bradford	Demonstration on Carbon. P. R. Salmon.
17	Camera Club	
17	Glossop Dale	
17	Greenock	
17	Handsworth	Lantern Night. Members' Slides.
17	Hull	
17	Liverpool Amateur	*Photo-zincography.* Frank Vaughan.
17	London and Provincial	
17	Oldham	
18	Birkenhead Photo. Asso.	*Lantern Slides and How to Make them.* The Secretary.
18	Cardiff	
18	Croydon Microscopical	Conversational Meeting, and Results of Epping Forest Excursion.
18	Holborn	
18	Leamington	
18	Lewisham	*Elementary Stereoh-potography.* F. W. Fenton-Jones.
18	Maidstone	
18	North Kent	
18	Plymouth	*Enlargement.* E. H. Micklewood.
19	Hull	
19	Leytonstone	Fourth Annual Dinner.
19	Southport	Last day for receiving Pictures for Exhibition.

ROYAL PHOTOGRAPHIC SOCIETY.

OCTOBER 1,—Technical Meeting,—Mr. A. Pringle in the chair.

As usual at the Technical Meeting following the opening of the Exhibition, the business consisted of the demonstration of the apparatus on view thereat.

Mr. WILLIAM TAYLOR (of Messrs. Taylor, Taylor, & Hobson) described the Cooke anastigmat lenses, Series III. for photography, and Series IV. for lantern projection which have already been referred to in the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY. He said that, since the original description of the lenses of Series III., before the Society by Mr. Dennis Taylor, they had been improved optically, and also mechanically, as regards their mounting, and they were now fitted to perform in a superior way all that had hitherto been done by lenses of the rapid rectilinear or symmetrical type. He also showed photographs which he said showed plainly the comparative perfection of the Cooke lenses in regard to oblique images and absence of astigmatism and curvature of field. The lantern objective had the negative element in simple form, the lens comprising only three pieces of glass, and test photographs evidenced its superiority over lenses of the Petzval type, such as were commonly employed for lantern projection, and its freedom from the defects of that class of lenses, especially curvature of field and distortion at the margins.

Mr. W. E. DEBENHAM asked whether the improvement of the Series III. lens consisted in enabling it to give fine definition? Mr. Dennis Taylor had said that it would not give sharp images, and it would not perform in a superior manner the work done by a rapid rectilinear lens unless it gave finer definition. He thought the distortion of a Petzval lens was imperceptible in ordinary lantern projection.

Mr. CHAPMAN JONES asked the aperture of the lantern objective; it appeared very small.

Mr. TAYLOR said some misunderstanding had arisen as to the application of certain remarks by Mr. Dennis Taylor and Mr. Dallmeyer on the occasion when the lens was first described, when Mr. Dennis Taylor said the instrument was not free from spherical aberration. This, however, applied only to the portrait lenses, in which Mr. Dennis Taylor thought fineness of definition was out of place; but, as a matter of fact, all the Cooke lenses were as free from spherical aberration as the best lenses of the rapid rectilinear type. One of their advantages, too, lay in the fact that the spherical aberration was easily adjustable, and their correction did not necessitate the regrinding of the lens, as was ordinarily the case. As to Mr. Debenham's remark regarding distortion with lantern objectives, they were usually used without a diaphragm, and the distortion shown in the comparative photographs was present in every Petzval lens under those conditions. The focal length of the lantern lens was five and a half inches, and experiment had shown that, when the condenser was properly adapted to the objective, the latter might be stopped down to *f*-11 without sensible diminution of illumination of the screen. The separate elements of the Series III. lens could not be used alone for photographic purposes, as they were not corrected independently.

The CHAIRMAN asked for some explanation of Mr. Taylor's reference to the proper adaptation of the condenser to the objective.

Mr. TAYLOR replied that, when a large illuminant was used, there was a good deal of diffusion of the light; but, with an illuminant of small size and a condenser of suitable focus and form, the light could be so condensed into the lens that a large aperture was unnecessary.

The CHAIRMAN said the point would bear investigation. He believed the introduction of the Cooke lenses marked a considerable advance in optics.

The other exhibits described included the following: The Frena film-holders, skate blade print trimmer, &c., by Messrs. R. & J. Beck; the Hepworth hand-feed electric arc lamp; Mr. W. R. Baker's Picket changing box; Mr. G. Davenport's mechanical arc lamp and patent carriers; Messrs. Penrose's dark slide for the half-tone process; Sanderson's swing-front camera (Messrs. Houghton & Son); the Leviathan automatic lantern; the Lothian stereoscope (Mr. A. H. Baird); and Mr. James Cole's rising and falling front camera. The demonstration of the remaining apparatus was deferred until the next Technical Meeting, the exhibitors not being present.

The CHAIRMAN, in thanking the exhibitors for their description of the several exhibits, remarked that the Society might congratulate itself upon the extremely high class of work displayed in the current Exhibition, and that he thought this year's Exhibition was superior to any that had preceded it.

OCTOBER 8,—Ordinary Meeting,—Sir H. Trueman Wood, M.A. (President) in the chair.

A considerable number of candidates for membership were balloted for and duly elected. It was also announced that several members had been admitted to fellowship, and that the Bournemouth Photographic Society had been affiliated.

The thanks of the Society were accorded to the donors of several additions to the library, and especially to Captain Abney for his gift of forty volumes of the *Journal of the Chemical Society*. Votes of thanks were also passed to the Judges and Hanging Committee at the current Exhibition, the PRESIDENT referring in appreciative terms to the manner in which they had discharged their very onerous duties.

The PRESIDENT announced that he regretted exceedingly that he was unable, at that meeting, to present the medals awarded at the Exhibition, as, owing to the short time which had elapsed since the judging, the firm to whom the preparation of the medals had been intrusted had been unable to complete them. In this connexion he said he was sure all were agreed that the competition had been quite as keen, if not more so, than in any previous year, and that the Exhibition would bear comparison with any that had been held here tofore. He then proceeded to deliver the Presidential Address [see page 645].

Mr. HORACE WILMER, in moving a cordial vote of thanks to Sir. H. T. Wood for his address, said the Society had always had very eminent men as its Presidents, and could congratulate itself apon the fact that the present President was in no way inferior to those who had gone before him as a member of the Council, he had always admired the admirable manner in which Sir Henry had conducted the affairs of the Society, sometimes under difficult circumstances, and upon the extremely happy way in which he met every question that cropped up. The point raised in the Presidential address as to the regulation of membership of the Council was one which should, and no doubt would, receive very careful consideration.

Mr. J. W. MARCHANT seconded. He had had the honour and pleasure of working with Sir Henry Wood as a member of the Council during the past two years, and had agreed with all he had said and done until this meeting, when he adopted the *lex non scripta* that the President should only remain in office for two years. He thought the members hardly knew how much they were indebted to the President for the labour he had bestowed in furthering the interests of the Society, but his work would be appreciated and looked back upon in time to come perhaps far more than it was at the present.

The motion having been carried by acclamation,

The PRESIDENT, in thanking the Society for the vote of thanks, said it was a pleasure to him to think that all the work of the Council had been thoroughly harmonious; of course, questions had frequently arisen with regard to which different opinions were held, but in such cases they had agreed to differ, and all had done their best to further the Society's interests, and always in a kindly and courteous manner. He felt strongly that there was a great advantage in having fresh people at the head of a society, and that a limited period was best for the presidency. The past two years had been a time of change and reorganization for the Royal Photographic Society, and he quite appreciated the fact that the majority of the members thought it beneficial that under such circumstances the head of the Society should be, not an eminent artistic or scientific photographer, but one who had of necessity had a great deal of experience in the management and work of a society. Such experience as he possessed it had been his pleasure to place at their disposal, and he hoped that, when the time for his retirement came, he might be able "to lay the flattering unction to his soul" that it had been of some little service to the Society.

The HON. SECRETARY (Mr. H. Chapman Jones) then read a paper by Professor W. K. Burton, C.E., *On the Formation of the Dots of the Half-tone Screen Image*. The paper was an attempt to give in succinct form the results of the investigations of Levy, Tallent, Dollond, Gamble, Eder, Bolas, Haddon and others, together with some observations by the writer. Professor Burton said that a hypothetically perfect negative should show the following characteristics:—1. The dots should vary in size from little more than a point to such magnitude that, overlapping each other in the highest lights, only a minute

transparent aperture was left in the middle of each group of four dots. This could be secured. 2. All dots should be of the same density. This could not be secured, but a minimum density sufficient to protect the sensitive film on the metal plate from isolation could be secured, and the ratio between maximum and minimum density could be reduced to a mere fraction of what it was in an ordinary negative. 3. Each individual dot should be of uniform density throughout. This could not be secured, but a sufficient density to prevent isolation could be secured to very nearly the extreme edge of the dot. 4. The outline of each dot should be sharp and abrupt. This could, to all practical intents and purposes, be secured. He did not agree with Mr. Bolas's contention that it was not desirable that each dot should have a sharp boundary between black and white; at any rate, with the processes most used at the present time, the best results were obtained from negatives with dots having a sharp rather than a graduated boundary. More attention should be paid to the relative widths of the opaque and transparent lines on the screen. Mr. Max Levy appeared to be the only investigator who had adequately considered this point, and he tended to the adoption of comparatively wide opaque lines with a view to increasing diffraction effect. The distance to which light might be spread by diffraction depended almost entirely on the distance between the screen and the sensitive film, and there were no means of simply calculating that distance. This was a very complicated question, but it would seem that what was desirable in practice was an arrangement whereby, after focussing the general image on a very fine ground glass, the screen could be introduced, and the distance between it and the sensitive film readily adjusted by a milled head, as in ordinary focussing, whilst the dots were examined by the aid of a powerful eyepiece. What was wanted was a process having a quality which had been described as "safe-edge," a film which would stand the effect of a comparatively large amount of light, without any developable effect, but with which uniformly increasing light would produce, after development, a rapid change from no density, or inappreciable density, to very considerable density. He had himself some years ago accidentally turned out a gelatino-bromo-iodide plate having the necessary "safe-edge." Lateral chemical action and irradiation had both been mentioned as causes for the spreading of the dot, and probably they had some small effect which in practice might be neglected. In making a dry-plate negative with the screen in actual contact, irradiation and lateral chemical action were as great, or greater, than with the screen some distance removed, yet their effects were not perceptible. Were a screen negative made directly from nature with the great range of light exhibited, irradiation and lateral chemical action would probably show very appreciable results in the high lights.

Mr. W. GAMBLE was of opinion that diffraction played a most energetic part in forming the density of the dot, and the necessary sharpness of its edge. There was no doubt, he said, that three actions took place in the formation of the half-tone dot—(1) the dioptric action, (2) diffraction, and (3) the penumbral action.

It was arranged that the paper should be fully discussed at the next Technical Meeting after the publication of the paper, and, a vote of thanks having been accorded to Professor Burton, the meeting terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THURSDAY, October 3, 1895,—Mr. J. E. Hodd in the chair.

Mr. W. T. WILKINSON passed round two or three wet-collodion negatives copied from albumenised paper prints and unintensified. He pointed out a few defects, comets (black and white), also a mark in one showing hesitation in putting it into the bath.

The HON. SECRETARY exhibited some prints from negatives taken on a well-known brand of plates, showing insensitive lines near the margin of the plate, which he attributed to drying marks, and asked if anybody had found similar defects.

Mr. A. L. HENDERSON thought the emulsion was insufficiently washed.

Mr. T. E. FRESHWATER remarked that he had recently exposed a couple of dozen plates, and had not obtained one free from blemish, although another batch exposed resulted in perfect negatives.

Mr. WILKINSON next gave a short demonstration of rolling up a transfer for photo-lithography. He said that the most essential part of photo-lithography was the negative, and passed round two, one on a dry plate and the other a wet plate. He explained that the best way to judge the quality of a process negative was to lay it on a sheet of white paper to see if it was perfectly clear. Having got a suitable negative, the next thing was the transfer paper. He preferred the autotype double transfer, the advantage of this paper being that the relief is very slight. The paper was sensitised in a bath of bichromate of potash and water, the time of immersion varying from one to three minutes. It was then placed face downwards on a sheet of glass, squeegeed into contact, and hung up to dry in a drying cupboard. When dry, the paper was stripped off and exposed to light under the negative until a good substantial image was showing. He passed round several transfers showing the amount of printing required. He mentioned several methods of inking up the transfer, and said that that mostly practised was by using a glue roller, and rolling up the transfer dry, taking care to do so one way only, until the turpentine used in thinning the ink had evaporated. He thought the most difficult thing for beginners to understand was the quantity of ink to leave on, and he passed round specimens of excessive and proper inking. The print was then soaked in water until the gelatine had absorbed all that it was capable of absorbing, after which, the superfluous ink was rubbed off, leaving the exposed portions only inked. It was then ready to be transferred to the stone.

Mr. HENDERSON mentioned that he had recently photographed an interior with a window at one end on an unbacked plate, giving an exposure of fifty minutes, the resulting negative being full of halation. Having no backing, nor being able to obtain any at the time, he made another exposure, backing the plate with a stiff mixture of powdered charcoal in apple jam or jelly, and by this means obtained a highly satisfactory negative. He was of opinion that it was quite equal to caramel.

PHOTOGRAPHIC CLUB.

OCTOBER 2,—Mr. Wilmer in the chair.

The Hon. Secretary laid on the table entry forms and particulars for the photographic section of the Stanley show.

Mr. E. H. Hobbs was proposed for membership by Mr. George W. Tottem, and seconded by Mr. J. A. Sinclair.

Mr. MARRIAGE then read a paper entitled, *The Rendering of Photographic Detail with Tele-photo Lens*, which was illustrated by about fifty pictures projected by the Club lantern. He also showed a form of camera with tilting table attached. With this photographs of ceilings and flooring could be made with great ease. He gave the exact formulæ for the taking of various pictures shown.

Mr. PRINGLE asked if Mr. Marriage had ever felt the want of a finer adjustment. Personally he had always felt this want.

Mr. MARRIAGE agreed in this.

Mr. WALL asked if Mr. Marriage had ever found distortion when using the lens to the full.

Mr. MARRIAGE said he had not.

Mr. PRINGLE said that, in times gone by, he had often had the desire to photograph such subjects as Mr. Marriage had now exhibited, but, of course, it was out of the question unless a huge scaffold was erected. He said, without doubt every one present, after seeing such examples, would unanimously agree with him *that Marriage was not a failure.*

Mr. HAES having been asked to say a few words upon the subject of architectural photography, said he had never attempted such subjects as Mr. Marriage had shown. The work he had done was from small carvings, to which he could get comparatively close.

A very hearty vote of thanks was passed by the members for the excellent paper read by Mr. Marriage.

Croydon Camera Club.—The winter session was opened on Wednesday, the 2nd inst., when the President (Mr. H. Maclean, F.R.P.S.) delivered his now customary annual address upon recent improvements and manifestations of photography. Amongst many subjects touched on were the "new" photograph, the camera and naturalist, Mr. Bergheim's portraits out of focus, and a description of and some experiences with the new Cooke lens. Speaking upon the winter's work, he said the Council proposed to give increased encouragement to the practice of enlargement, for which additional facilities had been provided, and announced that Mr. John A. Hodges (author of *Practical Enlarging*) had kindly promised to demonstrate on the 16th inst., at the Club, his successful system of enlarging by incandescent gas. Having cautioned members against the employment of very rapid plates when enlargement is in contemplation, and shown under what circumstances the rapid plate produces objectionable results, the speaker, in conclusion, sketched a scheme for the provision of facilities for enlarging with artificial light. A quantity of bromide paper and gelatine chloride paper (Sylvio brand) sent for trial by Messrs. Wellington & Ward, was distributed amongst members present.

Hackney Photographic Society.—October 1, Mr. R. Beckett presiding.—Mr. GOSLING gave report of the last excursion of the season to Wanstead Park, which had taken place on the preceding Saturday. In the course of his remarks he appealed to members generally to take more interest in and support these Club outings better. It was decided to have a discussion on the matter at the next meeting. Samples of Wellington & Ward's bromide and Sylvio papers were distributed for trial, as also was some backing paper for enamelled gelatino-chloride prints from the Great Eastern Store, Leytonstone. The after-part of the evening was given to showing members' lantern slides on the screen.

Bradford Photographic Society.—An Ordinary Meeting of this Society was held on October 3, Mr. A. P. Rendell in the chair.—The Rev. J. BEANLAND delivered a lecture on *Platinotype*. The lecturer pointed out the great advantages of the process amongst which were its cheapness, ease of working, permanency, &c. The disadvantage was its bad keeping qualities. After explaining the theory of the subject, he entered into the practical portion, and demonstrated development by means of a brush on the sepia and cold-bath papers. Numerous dodges by aid of glycerine were shown. Skies could be blocked out, portions of the picture held back or brought forward. Mr. Beanland, who has spent three years working with the platinotype paper, has a firm grasp of the subject, and members who were not present missed one of the most instructive lectures ever given before the Club. A vote of thanks was proposed by Mr. P. WILKINSON and seconded by Mr. P. R. SALMON, to which the lecturer responded. Numerous samples of Wellington & Ward's paper were distributed to the members.

Leeds Camera Club.—The Annual Dinner of this Society was held at the Grand Restaurant on Thursday evening, October 3, when about fifty members sat down to an excellent repast. A most artistic menu card, bearing the photographs of the present officers and committee was presented to each as a memento of the occasion. Amongst the guests of the evening were the Presidents of the Leeds, Bradford, Wakefield, and Limerick Societies. Some capital music was provided by various members and friends, including Messrs. Wigglesworth (tenor), Swinden (comic), Beckwith (mandoline), Willey (comic), Keighley (recitation), Nichols (who contributed a finely executed violin solo), and Duncan ("One of the Jays"). The toast-list included "The Queen," proposed by the chairman (Dr. Thresh); "Our Guests," proposed by Councillor J. Green-Hurst, and replied to by Mr. J. H. Walker, the President of the Leeds Photographic Society; "The Leeds Camera Club," proposed by Mr. Alex. Keighley, President of the Bradford Photographic Society, and was acknowledged by the President, Dr. Thomas Thresh; the toast "Our Sister Societies," proposed by Mr. C. C. Vevers, was responded to by Major Norwood on behalf of the Wakefield Society; while that of "The Press was moved by Professor Homburg, P.D.; "The Artists" was proposed by Dr. Thresh and seconded by Mr. Vevers; and, finally, "The Chair," proposed by Vice-President Irwin, and enthusiastically drunk amidst musical honours, terminated one of the most successful and enjoyable reunions since the formation of the Club.

Oxford Camera Club.—The first meeting of the winter session was held on September 30, in the University Museum, Colonel Impey in the chair.—The Secretaries announced the arrangements already made for several meetings, and, in response to their invitation to members to fill up the gaps, two lectures were promised, completing the programme before Christmas with the exception of one meeting. Steps were taken to render the literature belonging to the Club accessible to members, Mr. James Squire being elected Hon. Librarian. The slides of Yorkshire scenery belonging to the affiliated Societies were then shown and much admired. A few slides of the same county by members were also shown, as well as some of the neighbourhood of Oxford.

Rotherham Photographic Society.—The Sixth Annual Meeting was held in the St. George's Hall, Rotherham, on Tuesday evening, October 1, Dr. F. B. Judge Baldwin (President) occupied the chair. Good attendance.—Mr. H. C. HEMMINGWAY (Hon. Secretary) read the report, which showed a membership of sixty-four, including three honorary. From a work point of view there was reason for congratulation, although greater concentration of interest, added to a little determination, would result most beneficially. At the ten ordinary meetings the average attendance had been over twenty-one. The papers, demonstrations, and displays of lantern slides had been very successful and interesting. The Annual Exhibition in February was well patronised, and a small balance of profit accrued. The photographic survey of the district had made some little progress, and a "first display" had been made, over one hundred prints being arranged. The four excursions during the year had been less popular, judging by the attendance, which had averaged twelve. An enlarging lantern, for the use of members, had been acquired, additions had been made to the photograph room of the Clifton-park Museum, and some steps had been taken to secure increased accommodation for the ordinary meetings. There had been the usual members' competition, Mr. F. P. Cembrano acting as Judge. Mr. W. H. SHEPHARD (Treasurer) presented the financial statement, which showed a balance in hand. The report and statement of accounts were approved. Officers for the ensuing year were chosen as under:—*President:* Dr. F. B. Judge Baldwin.—*Vice-Presidents:* Messrs. E. Isle Hubbard, James Leadbeater, and G. T. M. Rackstraw.—*Council:* The Officers, and Messrs. W. H. Haywood, J. W. Baker, W. Mason, W. H. Shepherd, and J. Clarke.—*Hon. Treasurer:* Mr. A. S. Lyth.—*Hon. Secretary:* Mr. H. C. Hemmingway.—*Assistant Hon. Secretary:* Mr. J. W. Baker. Four new members were afterwards enrolled. Mr. J. LEADBEATER then gave a very practical paper on *What Lightning Is, and How to Photograph It.* After recapitulating the generally accepted theories with regard to lightning, he spoke of his own experience in photographing it. After a number of unsuccessful attempts, he at last had some reward for his patient labours. This was early on the morning of August 10, 1893. There was a lot of sheet lightning going on, in fact, it was almost incessant, and it fogged his plates wholesale. Noticing, however, that at every sixth flash of sheet lightning one of fork came at a certain point due east of where he was standing, he pointed his camera in that direction, and, after counting, gained the desired negative. His next essay was on June 26 of the present year, when he secured five good negatives from six plates exposed. One of the negatives showed two distinct flashes, and, had the lens been sufficiently wide in its angle, a third might have been obtained, for three flashes went at the same instant. It was a memorable storm. For photographing this phenomenon any ordinary camera would do. His lens was a rectilinear, *f*-11, and an ordinary plate. It was important that the focussing should be accurate, and he recommended attention to this matter when time was more abundant. For instance, an object about a mile away could be focussed, and then the baseboard of the camera could be marked as a guide for the future. He held the camera in his hand. Of course, this class of work was attended with considerable inconvenience, because it had to be undertaken during the hours of darkness, when the weather was at its worst. Having his camera charged and ready when he saw the storm approaching, he pointed in the direction of the expected electrical display, uncapped his lens, and immediately the flash had passed he recapped and prepared for other exposures. He drew attention to the instructions of the Meteorological Society, and concluded by showing, by means of the lantern, a number of slides of lightning flashes and contrasting them with an old painted slide illustrating the same subject. A vote of thanks was afterwards passed.

Sheffield Photographic Society.—The Annual Meeting of this Society was held in the Masonic Hall on Tuesday evening. As in former years, proceedings were commenced by the members partaking of a substantial tea, and then adjourning to the Society's rooms. The President (Mr. Firth) occupied the chair. The Treasurer presented his statement of accounts, which showed a balance in hand, and was unanimously adopted. The Secretary read his annual report, which was very satisfactory, and showed both an increase in members and a large amount of work done during the year. Votes of thanks were passed to the Auditors and retiring officers, and one or two matters connected with the Society were discussed. The President announced the Judges' awards in the annual competition, Mr. T. G. Hibbert taking the silver medal and President's prize, and Mr. S. Camp the bronze medal. The election of officers for the ensuing year was next proceeded with, and resulted as follows:—*President:* Mr. B. Nowill.—*Vice-Presidents:* Messrs. E. Beck, J. A. Tomlinson, and D. C. Brooks.—*Council:* Messrs. T. Firth, W. T. Furniss, E. H. Pearce, T. G. Hibbert, and S. Camp.—*Reporter:* Mr. Geo. W. Blackwell.—*Treasurer:* Mr. J. Smith.—*Secretary:* Mr. Herbert Ellis.

Edinburgh Photographic Society.—Report by the Council to the members:—We have now come to the conclusion of the thirty-fifth session of this Society's existence, and we have great reason to congratulate ourselves on the position in which we now are, although we do not intend to rest content with our present achievements, but to strive until we place the Society in the position of being unfettered with debt on its property. This can only be done by providing interesting lectures, having our lantern and elementary sections in perfect working order, and in organizing pleasant excursions during the summer. In this manner new members will be attracted to the Society, while we will retain the old. Through the change of office-bearers things were a little disorganized at the beginning of the session; but by every member of the Council putting his shoulder to the wheel this was to a certain extent got over The new office-bearers found, on taking up office, that each department was managed by a separate committee; but, as there was no means by which one committee could know what another was doing or spending, it was at once decided to dispense with these committees, and so to centralise the management of the Society's affairs in the Council. The result has exceeded the Council's most sanguine expectations. The affairs of the Society are easier conducted, sources of complaint have been removed, and the expenditure is better kept under control. The thanks of the Society are due to Mr. Oliphant for the constant trouble he has taken throughout the year in conducting the lantern section; and to Messrs. Bashford, Roddick, and Lugton for stepping into the breach caused by Mr. Ayton's elevation to the Presidentship, and subsequent sudden death, leaving the elementary section without a teacher. Mr. Lugton, who is a photographer of much skill and wide knowledge, has given with much acceptance to those members who attended, the last three lectures, or rather lessons, on elementary photography; and the Council hope to make arrangements with him whereby he will give six elementary lessons during next session. The lessons will be fully illustrated with examples and demonstrations, and are well worth the attention of the old, as well as the young, photographer. The dark room has been put into thorough working order; and the Council hope that members of the Society who use it will exert their best endeavour to keep it in that condition, *by carefully cleaning all dishes used by them, and putting them back into their proper places.* In connexion with the dark room, a number of new lockers were in the course of the year added, and a very few of these are still to let. The rent is 2*s.* 6*d.* for the year, and the Treasurer will be pleased to allocate them to the members who may desire them. Some additions to the library, in the way of books of reference, are desirable, and this the Council hope to do next year. This year, through the position the Council unfortunately found themselves at the beginning of the session, they were precluded from spending any money except where absolutely necessary. Some binding is in course of being done, and the Librarian hopes, when the funds will allow, to bind a good many more of the periodicals, including the Society's *Transactions*, than he has been able to do up to the present time. The Exhibition of this session proved itself in every respect an unqualified success. Not only was the work of a higher standard, but the number of visitors who patronised the Society's show far exceeded any previous Exhibition. The entertainments provided for members and their friends during the currency of the Exhibition shared in the popularity of the latter, and were largely attended; indeed, the attendance was so great at the two latter entertainments that many persons had to go away, being unable to gain admittance to the Society's premises. The Council feel that they owe the Society an apology, on account of their having been charged for admission to the first two "popular evenings;" but the financial position of the Society is their excuse. They have also to thank the members very cordially for their support, without which, of course, success could not have attended their efforts. In connexion with these "popular evenings," the Society owes Mr. Eddington a debt of gratitude on account of the great deal of trouble he took in connexion with them. Not only was he convener of the Sub-Committee, which alone entailed a considerable amount of work, but it was solely through his instrumentality that the various performers, whose services were so much appreciated, were obtained. During the session there have been nine general meetings of the Society and one special meeting. At the October meeting Mr. Charles A. Stitt gave a most interesting Exhibition of lantern slides, the result of a *Tour in Japan;*" at the November meeting Mr. Sydney Keith gave a similar Exhibition, and a paper on the *Convention Meetings in Dublin* last year; at the December meeting the incandescent gaslight was tested as an illuminant in portrait photography; and Mr. Hume gave a paper, illustrated with numerous interesting experiments, on *Photographic Colour Printing;* at the January meeting an illustrated paper was given by Mr. John Hislop on *Photo Process Work;* at the February meeting one by Mr. William Crook on *Art as Applied to Photography;* at the March meeting a paper by Mr. William A. Denovan, of the Rothesay Collotype Works, on the *Art and Practice of Collotype*, which he illustrated by a practical demonstration of the collotype printing process; at the April meeting an illustrated lecture by Mr. F. O. Bynoe, of Messrs. R. & J. Beck, Limited, on *The Modern Hand Camera;* and a few remarks on the *Blair Cameras and Films*, with a demonstration of their development, by Mr. T. Haddow. Rambles to various places of interest to the photographer have been arranged for every other Saturday afternoon; and the Council hope that, as the arranging of these rambles costs more trouble than members may imagine, they will take full advantage of the facilities provided. Full particulars will be found in the current (June) number of the *Transactions.* As to the arrangements for next session, the Council already have the Syllabus prepared, although the dates of the various papers are not yet fixed. Taken as a whole, the Syllabus to be submitted is of a varied character, and is calculated to meet the wants of all classes of photographers. The Society will also see from the announcement made in this number of the *Transactions* that next year's Exhibition will consist of three sections. The first section is an "open" one, in which both members and non-members must pay for space; the second section is for members only, and is pretty much on the same lines as the Exhibition of this session; and the third is for amateur members only, the medals having been presented to the Council under that condition. During the summer the Council hope that members will lose no opportunity of securing new members for the ballot at the October meeting. The Secretary will always be pleased to forward the Society's prospectus on application.

FORTHCOMING EXHIBITIONS.

1895.		
Oct. 11–Nov. 2	..... *Photographic Salon.	Alfred Maskell, Dudley Gallery, Piccadilly.
,, 11–Nov. 14	..... *Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.

Oct. 28, 29	.....	East London Photographic Society. Hon. Exhibition Secretary, F. Uffindell, 29 Scrutton-street, Finsbury, E.C.
,, 28–Nov. 2	.....	*Southport. G. Cross, 15, Cambridge-arcade, Southport.
,, 29–Nov. 1	.....	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.
Nov. 19–21	.....	*Hackney. W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 22–30	.....	*Stanley. Walter D. Welford, 59 and 60, Chancery-lane, W.C.
,, 28–30	.....	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

THE PALL MALL EXHIBITION.

To the EDITOR.

SIR,—For years past it has, I believe, been a printed regulation with regard to the contributions at Pall Mall that pictures are not admissible which have been previously shown within the London postal district. Whether this regulation was printed amongst others this year I do not know, but I presume it was, and must certainly have been understood by nearly all.

If I am wrong, kindly suppress this letter; if I am right, please insert it; because, what some people want to know is, whether it is not unfair on the part of some exhibitors to ignore this rule, apparently with the hope that the Hanging Committee will not remember?

With the numerous Exhibitions in London and suburbs, it is impossible for the Committee to always detect an infringement of such a rule, therefore it is the more incumbent upon the individual exhibitor to act in accordance with the entry form and regulations *which he signs*.

I will only quote two instances; there may be others. No. 1 in the Pall Mall Catalogue, *Greek Study*, appeared at the Tobacco Trades Exhibition, Agricultural Hall, not many months ago, and, if I am not mistaken, received an award. No. 286, *Ships that Pass in the Night*, was exhibited and medalled at Leytonstone last year. I repeat there may be other instances, and in quoting these two I trust the individual exhibitors will not suppose my letter to be prompted by any personal animus.

The proprietv of sending in duplicate prints to the Salon and Royal Photographic Society hardly perhaps comes under the same category, though something might be said upon this. Perhaps your excellent contributor, "Cosmos," might give us his views. He would form a more able censor than I.—I am, yours, &c., DRUID.

PHOTOGRAPHERS AS "ARTISTS."

To the EDITOR.

SIR,—May I be permitted a few remarks on what is termed a criticism by the *Daily Chronicle* in your current week's issue? Why should not a photographer lay claim in every right to the prefix of "artist?" Surely there are grades of skill in our profession, from an artistic point of view, as well as from a mechanical, that permit of the qualification. And, Sir, I contend that he is an artist who can conceive and work out an inspiration, even though it is by mechanical means. I admit there are humbugs in our profession who will see many points of art in a picture that never exists save to their artistic (?) eyes; but there are artists in photography wielding the camera with as much skill in their particular direction as those ethereal mortals who wield the hog's-hair.

Again, is it not received as a canon of art that "the inspiration of a theme is the grandest part of true art, and that the realising of the same is of minor importance to it?" One can never convert into realistic form all that an inspiration suggests—only an iota of it finds its place in the result; therefore, if a photographer is capable of receiving such thoughts, and even only partly establishing them in a picture, he is just as much within the limits of "true art" as "he" of the brush, seeing that the means of executing the theme are of minor importance to the inspiration of the same.

Many of the whole-page photo illustrations mentioned in another article in this week's JOURNAL show an infinite amount of skill and artistic perception; every point is carefully studied and worked out, and, to a degree, there is as much artistic knowledge and technical perfection brought to bear upon the subject as there is in work executed by artists with the brush, and often more so.

And, again, we have the advantage of "realism inspired," while our "brothers in art" rely chiefly upon their "inspired idealism."

The "gulf" that the writer mentions in his article has been bridged and that substantially, but by many of the modern school of photographers, and men belonging to the ranks of the latter are as much versed in the technique of art generally as their near relations—artists pure and simple.

And, Sir, understand me, I have no sympathy with the so-called "Linked Ring," because I hold that the highest aims and greatest benefits to the profession and art, from our point of view, will accrue by unity, for therein lieth power. I have merely written to you, not necessarily for publication, but because I think that it is unwarrantable to try and take from us that which we are striving to make ourselves and our art.—I am, yours, &c., H. EDWIN STILES.

THICK AND THIN GLASS.

To the EDITOR.

SIR,—Your correspondent, "Profanity" asks, has any one been troubled with plates of thin glass? I have just gone through eight packets of half-plates and in each packet I had three different thicknesses of glass. Some plates were so thin that they broke in the slides with the spring on them, whilst others were so thick that they would not fit into the slides at all. They must have been put up without the slightest supervision of any sort. I shall be glad to hear of any plates which can be depended on of uniform size.—I am, yours, &c., GEORGE AUGUSTUS GREEN.

Gravely Manor, Huntingdon, October 2, 1895.

STRIPPING GELATINE FILMS.

To the EDITOR.

SIR,—In this week's issue I notice a reprint from *Wilson's Magazine* of an article on "Methods of Stripping Gelatine Films," in the course of which appears a quotation from "the Apollo of January 1895" (?), referring to the stripping of films by means of hydrochloric acid. It is hardly safe nowadays to claim originality, but I should like to call attention to the remarkable similarity between this quotation and my own article on the "Transference and Enlargement of Gelatine Films," published in the JOURNAL last year, pages 489 and 504. As I say, it is not always safe to claim anything as absolutely original, nor is it a point I care much about but, if any reference to the use of this acid for the purpose mentioned has been made in the photographic press prior to my own detailed description of the process, I have not the least idea where it is to be found. I am glad to have the opportunity once more of directing attention to a simple method of enlarging, which I have found extremely interesting and valuable.—I am, yours, &c., J. PIKE.

Leicester, October 5, 1895.

FREE PORTRAITS.

To the EDITOR.

SIR,—I cannot allow this opportunity to pass of refuting the statement of your correspondent, "Lindsay Hemery," that I am morally a cheat. That I totally deny. Perhaps your correspondent is not aware of the terms of the circular sent out by A. L. Jarchy; if not, I refer him to the JOURNAL of September 14, where he will find it printed. If your correspondent will only refer to my letter of September 27, he will find that I make no statement of being one of the victims of A. L. Jarchy, but I had a few complaints from some of my customers. "Being in business close to the Green House," I took the trouble to find out if what they stated to me was true, which I did. The result you know in my letter of September 27.

Now, sir, I also deny that I am an automatic tool of any of A. L. Jarchy's "certain personal antagonists." I again state that A. L. Jarchy will not deny my statements in our local paper, and that no application has reached the Vestry in regard for the use of our Town Hall for this baby show. Apologising for troubling you again, I beg to sign myself,

BONA-FIDE AMATEUR PHOTOGRAPHER.

PEARSON'S WEEKLY AND PROFESSIONAL PHOTOGRAPHY.

To the EDITOR.

SIR,—Please find enclosed correspondence between myself and Mr. Pearson, of *Pearson's Weekly*, and also the offending announcement from the current issue of that paper.

I felt, upon reading the announcement, that it was an unwarrantable interference with photographers' interests, and wrote the editor, and re-

ceived reply as enclosed; and I venture to believe the matter of sufficient importance to warrant my directing your attention to it. Knowing your readiness ever to defend the interests of the profession, and as these interests are most certainly assailed by Messrs. Pearson's proposals, I pray you will give the matter publicity.—I am, yours, &c.,

PHIL NEWMAN, *pro* MAYALL & CO.

Daylight and Electric Studios, 91, *King's-road, Brighton,*
October 2, 1895.

"A GRAND OFFER TO READERS OF THE *STORY TELLER*.

"*Pearson's Weekly* will give, for a period of thirty days from October 9, a *beautiful three-quarter life-size India ink and crayon portait* free to any one who will bring or send them only 5*s*. and four consecutive coupons from the *Story Teller*. These portraits are of the finest artistic merit. They are absolutely permanent, being finished by the air brush, with indelible India ink, making them more permanent than any of the old styles of portraits, and they will last a lifetime. They would cost you, if ordered through artists, from three to five guineas!

"Have you father, mother, sister, brother, or child's photo that you wish enlarged—perhaps some dear one who has passed away, whose likeness is now fading, and should be preserved before it is too late? We will enlarge and copy it into a beautiful portrait for you. Remember, these portraits are absolutely free as far as we are concerned.

"How can we do this? We will tell you. We wish the *Story Teller* to have a very large circulation, such as it deserves. We know of no method whereby we can serve our subscribers better, and which will prove more popular, than by making the offer we now do. We expect to make many thousand portraits. Shall we make yours?

"You will get an unheard-of bargain by availing yourself of this grand offer, and we are glad to be able to give it to you. We can copy from any photos, large or small, tintypes, or any kind of glass picture. We copy all pictures bust style, head and shoulders only. When sending an order, enclose the picture you want copied in an envelope, and place your name and address on the back of the picture, and send the 5*s*. and four consecutive coupons from the *Story Teller* to our paper, and you will receive the portrait copied for you as soon as possible. Have no fear of losing your small picture. It will be returned in as good order as received. An example of the portrait we offer to give you can be seen at the offices of *P. W.* Address, Portraits, *Pearson's Weekly* Office, Henrietta-street, London, W.C."

COPY OF LETTER SENT TO C. A. PEARSON, ESQ., OF "PEARSONS' WEEKLY."

"*King's-road, Brighton, September* 30, 1895.

"To C. A. PEARSON, ESQ.

"Dear Sir,—I regret exceedingly to see in the current issue of your *Weekly* the announcement of free enlarged portraits to those readers sending you coupons and 5*s*.; and, to indicate the bargain awaiting them, you say the pictures would be three to five guineas in the ordinary way.

"If this is literally true, it would pay you to add 15*s*. to every 5*s*. sent you, and return the 20*s*. to each sender of 5*s*.; this would enable them to subscribe to your new publication for one year, and also give them a couple of days in the country or seaside, for in these days of competition no picture charged three guineas can be produced under a sovereign, either by air brush, hand brush, crayon, or pencil, and no matter in what numbers the order be given. If, on the other hand, it be a picture not worth three guineas, your statements are misleading. Had you given your readers a fair-size, artistically finished and framed picture for so many coupons, one could not have taken such exception, but to flood the country with cheap enlargements, and at the same time by inference say the photographic artist bests his client 55*s*. in 60*s*. is not fair, and, if you reflect, you must admit as much. Photographers, as a class, are not a wealthy fraternity, and really earn whatever money they control, and I am in a position to know there are many of them next door to starving, and to upset one of the sources of their legitimate business, as you propose, is an injustice to photographers as a class.

"I have contributed frequently to your F. A. Fund to take the little gutter children into the country, but your present action is calculated to deprive the humble photographer of the power to give his children the like boon. I have personally spent several pence each week for years in your publications, and recommended them to friends; but, unless some modification in your present proposals take place, so surely must my personal and general influence be used against your publications. I have been in the profession nigh on twenty years, and know thoroughly what I write about. I also know the members of the profession fairly well, and I am also acquainted with an institution known in the profession as "The Photographers' Benevolent Association," and the Directors of which always have more applications for help than it is in their power to relieve, and it is because I have the interest of photographers, and finishing artists, as also the good of mankind generally at heart, that I pen these observations to you, and I trust they may be instrumental in some way (which your resourceful brain may devise) of modifying this attempt to rob members of a hard-working profession of their bread and butter.

"If you will confine your attention to the production of the best penny-worth of weekly literature, and make it the best in the market, it is bound to command a ready and continuous sale; and, if it is not, no amount of 'send off' in the way proposed will make its existence a lengthy one.

"With best wishes, "Very faithfully yours,

"PHIL NEWMAN.

"P.S.—May I presume to suggest that if you wish to spend a sum in advertising your new publication, why not make the first two or three issues free? If the stories are good, readers would be only too pleased to subscribe for after-copies.—P. M."

COPY OF REPLY TO ABOVE LETTER FROM MR. PEARSON, OF MESSRS. "PEARSONS' WEEKLY," &c.

"*Henrietta-street, London, W.C., October* 1, 1895.

"Dear Sir,—Thank you for your letter. I think you will alter your opinion if you see one of the enlargements to which you refer. One is on view at the office here. If you are in town, and care to look in and see it, I shall be very glad. "Faithfully yours,

"P. Newman, Esq." "C. ARTHUR PEARSON.

COPY OF REPLY SENT BY P. NEWMAN TO MR. PEARSON, AFTER RECEIVING THE FOREGOING ANSWER TO HIS FIRST LETTER.

"*King's-road, Brighton, October* 2, 1895.

"Dear Sir,—Many thanks for your acknowledgment of my letter. I have no doubt but you will give the best value you possibly can for 5*s*., but no artist worthy the name would finish an already produced enlargement for the sum named. But it is not your intention in this respect I took exception to, but to your attempt to take away legitimate business from the photographers throughout the country, who rely upon an occasional order for an enlargement from their negatives for a guinea or two to keep body and soul together; and although it is a free country we dwell in, yet your present action will inflict great hardship upon photographers, and their allies the finishing artists, and I had ventured to hope you may have reconsidered the proposals you name in your paper. "I am, faithfully yours,

"C. A. Pearson, Esq." "PHIL NEWMAN.

AN APPEAL.

To the EDITOR.

SIR,—Since the unexpected retirement of Mr. A. H. Wall, of Stratford-on-Avon, from the position of Librarian of the Shakespeare Memorial, it has been felt by several of his friends that some substantial testimonial should be raised for the man whose artistic and literary work and thoroughly unselfish personality make him worthy of the gratitude of a large section of the public. It seems, to Shakespearian students, that he was the ideal man for the post of Librarian, and he only retired from it when a section of the Local Committee made it absolutely untenable. A strong provisional Committee, including Sir Henry Irving, Alfred Gibbons, Esq., of the *Lady's Pictorial*, W. Clifford Weblyn, of the *Illustrated Sporting and Dramatic News*, J. Farlow Wilson, of Messrs. Cassell & Co. Limited, Moy Thomas, of the *Daily News*, &c., has been formed, and it is hoped to raise at least 1000*l*. very shortly.

Mr. H. G. Somerville, one of the Honorary Secretaries, will write you, enclosing circular and asking you to give any assistance you possibly can in the matter. Although no appeal will be made to the public generally, the Provisional Committee has felt that, as Mr. Wall was so closely identified with photography, it would be perfectly reasonable to make the matter public amongst photographers.—I am, yours, &c.,

September 27, 1895. H. SNOWDEN WARD.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, backgrounds and accessories in exchange for rustic bridge. Photographs sent.—Address, W. HARMAN, Wye Valley Studio, Monmouth.

Will exchange 10×8 rapid rectilinear lens for good magic lantern and slides.—Address, WM. LORRAINE, Station Hospital, Birr, King's Co., Ireland.

Will exchange an enlarging easel, with light-tight case on top for rolls to slide down for pictures 26×20 and under, for table or hall paraffin lamp, banjo, or zither.—Address, J. K. TOWNSEND (Photographer), top of Mansfield-road, Nottingham.

Wanted Eastman's pocket Kodak, in exchange for Thornton-Pickard snap-shot shutter (new), fit one and three-quarter inch lens, and fifteen crimson plush half-plate opaline blocks, with brass corners and gold bevelled-edged glasses.—Address, A. BAXTER, 46, King's-road, Dundee.

"FOREWORDS" TO THE SALON CATALOGUE.

"THE rise of photography to the position of a pictorial art, though apparently rapid, has been, like any other form of real progress, a matter of slow growth.

"As a mechanical craft, photography has still its sphere of usefulness. On the pictorial side, chemistry, optics, and mechanism no longer predominate. They have become subservient and of secondary importance. Very little knowledge of them, indeed, is in any way necessary.

"The influence of the picture in bringing about the change from the old photograph to the new has been constant and steady, and almost wholly for the good. The parallel influence of the old photograph on the picture has been as constant and powerful, but by no means as completely advantageous.

"The draughtsman who seeks to imitate photography is certain to fail, since he is trying to copy, with imperfect means, just that particular quality which the optical craft can, if desirable, give to perfection.

"In its own department the pictorial photograph could easily out-distance the would-be photographic-like picture. But an ideal of grotesque unnaturalness is not one that the photographer will be in any great haste to claim.

"It is too early to foresee clearly what the effect will be of the new photography, with its fresh aims and modern methods. But with a craft of almost unlimited adaptability, used by those who have that particular combination of taste and imagination which we call artistic feeling, the influence can scarcely be less, and will probably be greater, than that of the older system which it now supplants."

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

B. T.—You must please repeat your original question.

C. G.—The discolouration looks as if caused by the colour of the mount being dissolved off by the mountant.

G. F. T. (Colchester).—We reproduced the cutting in this JOURNAL several months ago. Thanks all the same.

COLOURED PICTURE.—1. It is a photograph mechanically coloured. 2. The Photochrome Company, 61, Ludgate-hill, E.C.

PROCESS.—Messrs. Mawson & Swan supply powdered bitumen specially treated with ether, to render it more sensitive to light, for process work.

SHELFORD PAROA.—The bath does not work at its best until it has been mixed for many hours. The reactions that take place in the time are very unsatisfactorily understood; or, rather, there are different opinions on the subject.

BAZAAR.—Any of the old manuals on photography, published a dozen or more years ago—Jabez Hughes's, for example—will give working details of the glass positive and ferrotype processes. A series of articles on the wet-collodion process was given in the JOURNAL in the early part of the present year.

T. H.—The most practical lesson you can have is to visit the Exhibitions of the Royal Photographic Society and the Salon, and study the pictures there shown, also those shown in the shop windows by the best artists. Do not suppose that every out-of-focus photograph is a picture, as many appear to do at the present time.

ERNEST.—1. Either the bromide or the platinotype process will yield prints equal to that forwarded; it is simply a question of manipulation and character of negative. 2. Consult our advertisement columns, and get prospectuses from the different makers, and then see which apparatus will best suit your requirements.

T. E. HORTON.—1. The used developing solutions from dry plates are not worth saving, as they contain no silver. The case is different with wet collodion. Here the developer after use contains a considerable quantity of silver, and is well worth preserving where the process is worked on a small scale. 2. Cyanide of potassium is more generally employed for fixing collodion negatives than is the hyposulphite of soda. 3. It is not necessary to filter the silver bath every time it is used.

G. W. C.—We should not advise you to institute proceedings, as it is more than doubtful if you can establish a legal copyright in the work. It is, as you say, exceedingly vexing to see your work pirated without getting any recompense. From the tone of the publishers' letter, it may fairly be assumed that they would resist any claim that might be made, or defend any action that might be raised. Therefore, we should say, under the circumstances, Do not go to law on the matter against a wealthy firm.

R. COLES.—The apparatus, as described, with the "very large (twenty-one inch) single lens as a condenser," is a solar camera for making enlargements with. It is but seldom used in this country, as it cannot be worked when the sun is not shining. In America and on the Continent, where the sun is more in evidence than it is here, the solar camera is used for making enlargements direct by the carbon process (and platinotype process, also, at times) on albumen paper. We are not at all surprised at the small price asked for the apparatus.

S. U. N. complains that he cannot make a good enamelling collodion, though he knows the gun-cotton is not at fault, because, when he uses absolute alcohol and ether, it is all that can be desired; but, when methylated spirit (not the mineralised) is substituted, it is impossible to coat a plate free from crapiness. He asks if it is possible to make a good collodion for enamelling prints when methylated spirit is used.—Yes, quite good enough for the purpose; but the spirit must be strong—not less than sp. gr. ·820. The trouble has been from the employment of too weak a spirit.

W. B.—We know of no such books. You had better obtain access to the directories published by Messrs. Kelly & Co., Great Queen-street, London, W.C.

D. BIDGOOD.—The year is far advanced for beginning hand-camera work for the first time. The only advice we can offer is to have a lens that will work with a large aperture, and use highly sensitive plates. Bear in mind that a lens that works at *f*-5·6 requires but half the exposure of one at *f*-8, and one with *f*-4 will work in half the time of one at *f*-5·6. However, as you are not an inexperienced hand with a stand camera, there is no reason why you should not get good results even at this late season. "Instantaneous exposures" have secured good negatives of even skating scenes.

FAIR PLAY writes as follows: "Will the Editor kindly inform us, can we advertise a man that has left us without giving us any notice, when he is under an agreement to give or receive one month? By his so doing he has more than inconvenienced us, and we are most anxious to ascertain his whereabouts, that we may teach him better manners."—Yes, you can certainly advertise the man, but you must be prepared to defend an action for libel if the advertisement is one that can be construed into a libel, and probably any such advertisement as you wish to publish could be construed into one.

ANXIOUS writes: "Is the careful use of a hand-feed electric arc lamp for studio work likely to be injurious to the sight, or to cause any trouble to the eyes? If so, would you advise the use of special glasses or spectacles, and where can they be obtained? I have had a good bit of irritation in the eyelids since using it, and have fancied that my sight, which is an ageing one, and requires the help of glasses for near objects, has been affected somewhat."—We should certainly recommend our correspondent to obtain a pair of plain dark blue, or deep, "London smoke" glasses; an inexpensive pair will suffice. They should only be worn when actually manipulating the light. They may be had from any one who supplies spectacles.

E. ROBINSON asks: "Will you oblige me with information respecting a small studio which I am about to erect? I have a space of ground on which I want to erect a studio with one side wall and a back wall, and I should like to know if one side light will be sufficient? The length will be fifteen feet, and out of that how much blocking out side and top light to enable me to get a good picture, and if it is possible to get a good lighted picture with one side light only? The size I anticipated is: height nine feet, width eight feet, length fifteen feet."—One side light will suffice; but the studio will be very small if constructed the dimensions given. If they are retained, four feet at either end may be blocked out. We should advise the size to be increased in all directions if the studio is intended for serious all-round work.

NEW ZEALAND asks: "1. Can I lengthen the focus and increase the covering power of Ross's 3A *carte-de-visite* lens without slowing down by placing another lens at back of stop? 2. If so, where can I get the lens, and cost? I have tried to get those mentioned in year-book, but failed so far in this district. 3. Will there be any or much loss of definition?"—In reply: 1. The focal length of the lens can be increased and its covering power enhanced, but it will, necessarily, make the lens slower in working. The normal *f*-4 may become *f*-16 or *f* anything, according to the power of the negative lens that is used. 2. Any working optician will supply negative lenses to order. If the lenses were an inch or an inch and a quarter diameter, ordinary spectacle lenses would suffice, but we suspect that lenses four inches in diameter would have to be made to order. 3. There will be some, except the lens is used with smaller stops.

J. P. says: "Can you tell me what kind of lens would give equal definition to a lantern slide enlarged up to, say, sixty inches? As a help in drawing a subject I desire to paint, I sometimes photograph it and make a lantern slide therefrom. I then go over the outline on the canvas with charcoal, and afterwards proceed to paint from notes I have taken of the colours. The objective in my lantern gives a fuzzy foreground when the distance is sharp, and a fuzzy distance when the foreground is sharp. I find also that the relative distance of different objects is disturbed when the lens is racked in or out to procure sharpness. If you can tell me what kind of lens (and the probable cost) will obviate these difficulties, and at the same time admit of as brilliant an illumination as the ordinary lantern objective, I shall be much obliged."—The lens in use evidently has a very round field, and is not suited for lantern purposes. If our correspondent has a *carte* lens, of short focus, that will suffice. If not, he should get a lantern lens from any of the dealers who make a speciality of lanterns. They are not at all costly.

CONTENTS.

	Page
OUR FORTHCOMING ALMANAC	641
IS HAND WORK LEGITIMATE ON PROCESS BLOCKS AND PHOTO-GRAVURE PLATES?	641
THE CHOICE OF METHODS IN INTENSIFICATION	642
JOTTINGS. By COSMOS	644
ROYAL PHOTOGRAPHIC SOCIETY	645
LABORATORY NOTES AND NOTIONS. By EDWIN BANKS	647
METHOD IN PHOTOGRAPHY. By WILLIAM F. MILLER	649
PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM	649
OUR EDITORIAL TABLE	649
NEWS AND NOTES	650
RECENT PATENTS	650
MEETINGS OF SOCIETIES	651
FORTHCOMING EXHIBITIONS	653
CORRESPONDENCE	654
EXCHANGE COLUMN	655
ANSWERS TO CORRESPONDENTS	656

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1850. Vol. XLII.—OCTOBER 18, 1895.

COLLODIO-CHLORIDE PAPER.

Said a well-known photographer to us quite recently, "Yes; it has come to stay," and, from inquiries we have made in many quarters, that is the prevailing opinion. One of the most singular facts in connexion with this paper is that, although it has been so long before the public, it is only quite recently that its influence as a printing medium of value has begun to be felt. It is over a quarter of a century ago when the incident of the introduction of a so-called Liptograph paper occurred. It may be remembered by some of our readers that it was heralded as a new invention, though collodio-chloride paper had already had a small success; hence it was quickly rechristened Kleptograph by one of the punsters of the period. It had, as we say, a small success, but, being difficult to make and expensive to purchase, there were very few who regularly employed it. Since the introduction of various kinds of gelatine P.O.P. it has been reintroduced by makers in this country, and C. C. paper, "made in Germany," has also been thoroughly and perseveringly pushed into prominence. There cannot be a doubt that, in its preparation, there are more difficulties to be met with than are experienced with either gelatine or albumen-sensitised papers, and it is very remarkable that already it is produced at a price so little above that of the cheaper and more easily produced gelatine; but, when it is at last put into the photographer's hands, he has a medium of the greatest merit for getting the highest value out of his negatives. It is quite impossible, with any manipulation whatever of albumenised papers, to get the effects producible with collodion paper. To a certain extent, of course, the same may be said of ordinary gelatine paper; but, if for no other reason, the latter is inferior in artistic effect on account of the superabundant gloss of its surface. Collodion gives a surface much resembling albumen, but with even less brightness of surface.

A collodio-chloride print, as also is the case with gelatine, gives a tone more like an enamel, entirely free from granulation. Unlike gelatine, it never presents a double colour. It gives delicate drapery, lace, and fine light detail generally, with a perfection of crispness, which is very pleasant to look at, especially in small work. For the very smallest kind of picture—heads one-eighth of an inch, and so forth—the results are exquisite, and cannot be touched by albumen. Again, a negative so weak as to give a poor, flat print in albumen, is just about what is right for collodion. Some of those we have discussed the subject with place this as a defect, for they say such a negative is useless for platinotype, and they prefer one suitable for either process, but a good negative for platinotype will also give a good print in collodion, so that there is little force in the argument. Those who prefer a highly glazed print such as is obtained by the "glazing" process of squeegeeing upon glass or ferrotype, object to collodion, seeing that with the latter much more trouble is involved. When glazing is looked upon as necessary, this is, no doubt, a defect, for collodio-chloride paper cannot be treated like gelatine. The glazed support requires a preliminary coating with collodion.

Another excellent quality in collodio-chloride paper is the very beautiful matt surface that can be given to it (before printing). It is almost impossible to differentiate it from platinum, a point which strikes us as being by no means an advantage, opening the way, as it does, to fraud. Indeed, we have been positively informed by the representative of a dealer in matt collodion paper that some of his customers use it, and send out the prints under the name of platinotype. This is a fraud in a double sense—upon the user, and upon the whole body photographic, who are thus put under an unfair competition. We are sure that the majority of photographers will join us in characterising this as dishonest in the highest degree, if shades of turpitude can be so indicated.

When we turn to a consideration of the working of the paper, there is undoubtedly plenty of trouble in store for the inexperienced user. There are already many brands on the market, the quality of which varies to a very considerable extent. Some curl when wet, others blister, while others, again, crack and peel. So many are the complaints in this direction, that some photographers who have commenced to use it have felt compelled to give up collodio-chloride printing. To them we would say, "Try another make, and keep trying, till you hit upon what pleases you, for such a kind certainly is to be found."

We must observe that a very great deal depends upon the storage and the treatment of paper and prints both before and after using. The printer who brings his sensitised paper into his printing room, probably with an average high temperature, and flings his prints to collect before toning into a drawer or box, need not expect to be successful with collodion paper. If it has certain qualities, they must be humoured; the paper should not be condemned because the finished prints are useless after ordinary treatment. If, however, the paper, as soon as received, is put flat between boards (preferably weighted), and in a cool place, a small quantity at a time

only being brought into the printing room, and if the finished prints are kept equally flat and cool, ninety per cent. of the difficulties will vanish. It is really remarkable what a great difference can be brought about by attending to such simple precautions as these.

The gravest defect is the blistering; this, again, is more likely to be produced with some brands than others; but one very potent factor in their production is the use of over-strong hypo. Fifteen per cent. is ample, and we do not think that an ounce and a half, or even an ounce, to the pint would be too weak for permanency in the finished result, provided that a sufficient quantity be used, and that the prints be kept well in motion and not allowed to remain long in contact while fixing. The whole image lies so close to the surface, and is held in a medium so readily permeable by water, that the precautions necessary with albumen are needless, or excessive, with collodion. We think we have brought the matter fairly before our readers, and we shall feel satisfied if we have given some help to the introduction of such a most valuable printing medium as collodio-chloride paper.

THE USE OF THE SWING BACK IN ENLARGING.

Directions are freely given, by writers on the subject of enlarging, how, by suitably tilting or inclining the negative, instead of holding it in the usual position, perpendicular to the axis of the lens, the converging lines of a badly levelled architectural subject may be restored to correct form; but very few of those who devote any of their time to enlarging probably think it worth while to resort to this very simple remedy for a defect that is undoubtedly greatly on the increase in these days of hand cameras.

Many are, no doubt, deterred from making the attempt under the impression that the straightening of the convergent lines in this manner must result in a considerable loss of sharpness; but the idea, though correct enough in the abstract, is unnecessarily exaggerated, since, except in very bad cases, the effect upon the definition is practically inappreciable, and, as we shall endeavour to show, can by suitable measures be reduced to absolute nothingness. We were ourselves unaware, until quite recently, to what lengths this principle can be carried without seriously interfering with the sharpness of any portion of the picture; but the rectification of the uprights of some hand-camera pictures taken by a novice in the use of the instrument, some of which were five or six degrees removed from perpendicularity, quite surprised us by the extraordinary latitude allowed. We have, in fact, by way of experiment, taken a sheet of printed matter the size of a cabinet mount, and inclined at such an angle that the bottom portion was an inch nearer to the lens than the upper, and yet reproduced it with practically uniform sharpness over the whole area, though, of course, distortion of another kind was set up by the treatment. Though we are far from wishing to give advice that may seem to encourage slipshod methods of working, we shall try to show how this treatment may enable the use of the swing back, in taking the negative, to be absolutely dispensed with without any loss of quality of result; or, in other words, we shall show that hand-camera workers who have not a swing back available may derive all the advantages of that movement from a proper manipulation of the negative in copying, whether for lantern slides or enlarging.

In the first place, we think it must be agreed that in the great majority of cases the greatest amount of general sharpness is obtainable when the axis of the lens is coincident with the centre of the plate and perpendicular thereto. Consequently, any use of the swing back or rising front tends more or less to loss of marginal sharpness, and necessitates the use of a smaller stop. If, then, a negative that is perfectly sharp, and whose only fault lies in convergence of the perpendicular lines from tilting the camera without using the swing back, can have the rectitude of its lines restored without loss of sharpness, it seems an argument rather against than in favour of the swing back.

Yet such is absolutely the case, and all that is requisite is to incline the negative at a suitable angle to produce perpendicularity, and, at the same time, to swing the back of the reproducing camera, in order to correct the loss of definition on the different planes. The inclination of the negative alone will suffice to bring the perpendicular right, but it will be at the expense of sharpness; but, if the negative and reproduction be inclined in *opposite* directions, the whole surface may be got into equal focus and that without the use of an inconveniently small stop. This fact can be demonstrated mathematically.

Let us suppose a square block of buildings, a picture or any object that should be rectangular, to have been photographed in such a way that the negative renders the upper portion of it, say, one-fiftieth of the whole length shorter than the bottom, a degree of "slope" that is far exceeded by many of the hand or even *stand*-camera pictures we have seen. To restore this to rectangular form, clearly the upper portion of the picture must be enlarged one forty-ninth more than the bottom; or, in other words, to reproduce it on the same scale, but square, the bottom must be photographed the same length, while the top is enlarged to one and one-forty-ninth its present length, and these conditions can be perfectly fulfilled in the manner described by inclining the negative and the copy in opposite directions.

Let us suppose a lens of 8 inches focus to be used, and for the present we will assume it to have a theoretically perfectly flat field. The inclination at which to place the negative is arrived at in this way: The portion representing the base or wider part of the building or picture will have to be removed from the lens twice its focal length, or 16 inches, while the opposite or narrower extremity will, by the laws of conjugate foci, have to approach nearer, $15\frac{42}{50}$ inches being the exact distance. On the other side of the lens the correct-sized portion of the image will come to focus at the same distance as that part of the negative, namely, 16 inches, while the other extremity will focus slightly further away, or at $16\frac{8}{49}$ inches; and, if the back of the camera be swung to that extent, not only will the upright lines be found parallel, but the definition stop for stop will be as perfect as if the negative and copy were both perpendicular and parallel. We have spoken of a theoretically flat field, but, so far as flatness and roundness of field go, the only influence they would have in the matter would be that a so much worse effect would be produced with a lens possessing a curved field if the swing back were used in taking the negative; in the process of reproduction the quality of definition as it exists will be neither improved nor the reverse.

By examining these figures it will be seen that they bear a definite and intelligible relation to the degree of distortion and to the focus of the lens used. On one side of the lens there is

a difference of the eight-fiftieths of an inch between the lens and the top and bottom of the negative respectively, while, on the other side, the difference is eight-forty-ninths of an inch, two fractions in which the enumerator is represented by the focus of the lens, and the denominators by the degree of enlargement and reduction relatively between the object and copy. This gives a definite rule for fixing the position of the negative, since it shows that the inclination of the latter is equal to the total falling in of the *two* sides of the building multiplied by the focal length of the lens employed; or the angle at which the negative should be placed to secure correct perpendiculars will be sixteen times the amount of error in *either* line in the original.

This is for reproduction to the same scale as for a lantern slide; but, if we come to enlarging, we shall find that, while the same principle holds good, the figures are materially altered. For instance, in enlarging to four diameters, we shall find that, while the difference between the two extremities of the object at the negative side are *divided* by five—the number of enlargements plus one—on the other side, the difference is multiplied by five, a definite relation existing all through between the two positions, which depends entirely on the number of times of enlargement or reduction. In copying to the same dimensions, the differences on opposite sides of the lens are trivial, but, in enlarging, they are apparently very wide apart; but, if size of the enlargement be taken into account, the angles of the negative and copy respectively will be found to be practically the same.

In putting this principle into practice, it will suffice to measure the angle by which the extreme uprights depart from the perpendicular, which is easily done with an ordinary protractor, and to set the negative at that angle, multiplied by twice the focal length of the lens in inches; then, for the other inclination, it will be safe to swing the camera till the lines are parallel or perpendicular, and to focus in the ordinary way.

The Queen and Stereoscopic Photography.—We understand that Her Majesty the Queen has shown her interest in stereoscopic photography by accepting a beautifully made and fitted stereoscope of the Holmes form, the work of Mr. W. I. Chadwick, of Manchester. During Her Majesty's stay at Cimiez last spring, several stereoscopic views and groups were taken at the villa by Mr. A. L. Henderson, who also obtained some excellent stereographs of the Queen and the Royal Princesses, with which, we understand, Her Majesty was greatly pleased. This Royal appreciation of stereoscopic photography should materially help to still further popularise a beautiful and fascinating branch of work.

A Good Example.—Sir R. T. Ball, the Director of the Observatory at Cambridge, has made the announcement that, during the full Michaelmas term, on fine and clear Saturday evenings, one of the assistants will show different celestial bodies of interest through one of the large telescopes to any visitors who may apply at the Northumberland Dome between the hours of eight and half-past ten. This is a privilege of no mean order, and is worthy of being followed at other observatories. Few of the general public have ever seen any of the celestial bodies through a telescope of large dimensions, and they would gladly make a short pilgrimage to do so. Could not the same privilege be accorded at other observatories, such as Greenwich or Kew, on one or two evenings a week, for the benefit of dwellers in the metropolis?

The County Council and Gas Cylinders.—Is the London Council going to interfere in entertainments where the lime light is employed? It would almost seem as if it were. It will be remembered that last winter an entertainment was forbidden by the Council unless the cylinders were placed outside the building, and that had to be done. Last week at the Newington Sessions the Licensing Committee of the Council recommended the granting of a licence to the South London Music Hall only on the undertaking that gas tanks, to be approved by the Council, or the electric light, should be employed in place of the lime light as now used. If this meddlesome body is going to interfere with lime-light entertainments, and the railway companies persist in their stringent rules as to the transit of cylinders, we fear there is anything but a smooth course before compressed gases. By the way, when is the report of the Committee appointed by the late Home Secretary to be issued? The lantern season is at hand.

The Winter Session.—The summer vacation of such photographic societies as have one is now over, annual meetings are being held, and reports for the past year submitted. These, on the whole, are exceedingly satisfactory, and show a healthy state of photography. With regard to photographic outings, they, as of late years, have not proved great successes in the majority of cases. It is noteworthy, however, that the most successful, and most largely attended, outdoor meeting has been where some one has acted as *host* on the occasion. With the advent of the winter session, the lantern season commences, and this reminds us how much lantern pictures are improved by the introduction of clouds on the cover glasses, though it is comparatively seldom done. It may here be mentioned to those who, up to the present, have not secured a stock of cloud negatives for winter, that it is not too late to do so. There is rarely a fine day during the present month on which a great variety of cloud negatives may not be obtained, often better than any other period of the year, but no time should be lost in the matter.

Painters' and Photographers' Ideas of Copyright.—In the current number of the *Magazine of Art* are the opinions of a number of artists on the question of copyright and "Suggestions for a new Copyright Act." That a new Act is desirable, or, as an alternative, that the present one be amended, there is, we think, no question; but not such a one as regards photography as some painters would like. Some of those who have expressed an opinion would make a distinction between engravings from original pictures, which should be treated differently from photographic reproductions, mainly, so it would appear, because the former take a much longer time to produce than do the latter; *ergo*, because an engraving takes longer to produce than a photogravure, it must necessarily be a more artistic production, and therefore should be treated differently under a copyright law. The time bestowed on a work is no test of its merits, or, if so, it is a new dictum. In a case of piracy some months ago, the learned Judge told the jury that a man had as much title in his copyright as he had in any of his personal property. But why should there be a question of degree in the matter as suggested? Photographers should keep a sharp eye on their interests in the copyright question, as the matter may be dealt with in the near future.

The Falls of Foyers.—Aluminium is now being largely employed in connexion with photographic apparatus, but it has given rise to a good deal of correspondence in the daily press during the last few months and some questions in Parliament. An outcry has been raised that a point of interest alike to painters and photographers in the North, the Falls of Foyer, is being destroyed by the British Aluminium Company for their new works. Last week a further correspondence between the Duke of Westminster and the Company was published. In this the latter, while maintaining their right to deal as they like with their own property, deny some of the statements made by his Grace a few months ago, that the beauty of the place will be destroyed by the new works. They, however, admit that the quantity of water passing over the falls will be considerably diminished, as they, in their letter, say that "such water as the Company does not use will pass over the Falls as at

present; also that, unless the Company's proposals as to storage of water in flood times are allowed, they may, in times of scarcity, be compelled to utilise the whole of the flow. The absence of water and the presence of manufacturing works will certainly not conduce to the improvement of one of the most picturesque spots in Scotland and a point of interest to photographers.

Art Reproduction at Home and Abroad.—In his address at the Royal Photographic Society last week, the President (Sir H. Trueman Wood, M.A.) referred to the prizes recently given by the Society of Arts in connexion with photogravure. These prizes, it will be remembered, were offered with the view to seeing if there was any real reason why artists and publishers should send so many of their works to the Continent for reproduction, and also to stimulate art reproduction in this country. This is a very laudable idea, and it is to be hoped it will have the desired effect. There was one point connected with the competing negatives that was noteworthy, namely, they were all, if we remember rightly, on gelatine plates, whereas, so we are informed, collodion ones are employed almost, if not quite exclusively, on the Continent in the reproduction of paintings. In photogravure, the image on the metal plate is obtained—by the etching method—by means of a bichromated gelatine resist, and in the depositing method by means of a gelatine relief. The transparency in the former system is also in bichromated gelatine. Now there is a very general impression amongst the most successful workers of the mechanical methods, where bichromated gelatine is in question, that better results are obtainable from collodion negatives than from gelatine ones. Hence the collodion process is used almost exclusively by photo-mechanical workers, even in this country. We do not, however, attach much importance to this matter, we are rather inclined to the opinion, expressed before, that one of the principal reasons why so much work is sent to France and Germany is that there more skilful hand work is put upon the plates than is the case here. High-class line and mezzotint engravers appear to be an extinct race, and some publishers only have photogravures because they cannot get anything else, and they prefer them to look as much like veritable engravings, and as unlike photographs, as possible. The same remark also applies to the artists who produced the originals. They as a rule disparage photogravure, and lament the extinction of line and mezzotint engraving.

DEVELOPMENT BY MEANS OF NASCENT HYDROGEN.

In his "Laboratory Notes and Notions," in last week's JOURNAL, my friend, Mr. Edwin Banks, touches upon a subject that has had a considerable interest for me during many years past when he speaks of the possibility of development by the galvanic current, or, rather, by the hydrogen given off in the decomposition of water. As far back as 1870, in the course of an article in these pages, under the title, I think, for I have no immediate means of reference, of *The Latent Image and the Theory of Development*, I suggested, as a hypothetical explanation of the reduction of the silver haloid in alkaline development, that it was due to the action of the nascent hydrogen evolved in the course of the oxidation of the pyro; and, though I was promptly "sat upon" by some dreadfully scientific individual, whose name I never heard before or since, I am glad to find at this distance of time that my idea was not so utterly absurd as my critic then supposed. Although I have been acquainted with Mr. Banks for a good many years, I am pretty certain that this matter has never formed the subject of conversation between us, and therefore the possibility of the experiment quoted by him has not been suggested to him by me.

I have made many attempts in a like direction, the best success having been obtained with collodion films separated from metallic plates by means of a septum of vegetable parchment, and immersed in various solutions, alkaline as well as faintly acid; but, wherever the reducing action has been at all powerful, it was too much so, and it was difficult to decide whether there was any discriminating action that could be set down to development, as distinguished from general reduction. Where the action was weaker and more gradual, it was still difficult to recognise any real development, except in the case of a very long exposure of one portion of a plate while the rest was kept covered, and so presented strong contrasts. I have, however, long felt certain that successful development could be performed by means of nascent hydrogen, provided the surrounding circumstances were sufficiently favourable.

As a further step in this direction, I would like to mention an experiment that suggested itself to me some years back, but which I have never found the opportunity of putting to the test of actual trial. Many of the mercurial alloys or amalgams are decomposed in the presence of water, an oxide being formed and hydrogen evolved, amongst the number being ammonium, sodium, potassium, and magnesium amalgams, all of which result in the formation of the metallic hydrate in solution, while hydrogen is set free. These seem to be the precise conditions requisite for success. If an exposed plate be submitted to the action of distilled water in close proximity to a surface of one or other of these amalgams, the hydrogen given off will reduce the exposed haloid, the bromine set free will combine with the alkali formed, and render the process continuous and at the same time hold in check the too powerful reducing action of the hydrogen. In fact, just as in the course of ordinary development, the restraining bromide will be formed in gradually increasing quantity as the action proceeds. W. B. BOLTON.

ON THINGS IN GENERAL.

PHOTOGRAPHY and the two photographic exhibitions now on view have scored the greatest success ever yet achieved by photographic pictures. Not once have I heard that the Royal Photographic Society lays claim to the possession of any art qualities in the array of photographs on the walls of the Old Water Colour Society's room now displayed; yet there has of late, especially since the opening of the Exhibition, been such a howl of contempt from the wielders of brush and palette, or their mouthpieces, at the thought that a photograph can possess any art qualities whatever, that we may consider the battle won. "Methinks he doth protest too much." Not content is he, the critic, in withholding the term fine art; photography is not even an art. Photographers, he says, have to "forego all knowledge of drawing, of composition, of light and shade, of selection, of arrangement." Mr. Hollyer has a portrait "dignified in pose" (no arrangement!); "direct in light and shade" (no knowledge of light and shade—the sun drew the blinds and fixed the reflectors!) Mr. Annan has a photograph of a subject which could be better treated by brush and paint, so the critic says. There was no selection, no light and shade—no, it was a "happy fluke!" The "happiness," however, was not art, for the critic says photography could not be art. He is not artful enough, or he would be more logical.

Mr. Seymour Lucas, however, is most delightful in the *Magazine of Art* for October. "Fine engraving is a great art," he says, "and should not be classed with photography, which, in my humble opinion, is nothing more than a mechanical operation, where very little artistic skill, if any, is required; in fact, it is the sun that makes the picture in a few seconds. . . . . I do not like the idea of photography being mixed up with art." This is all very cunning. Mr. S. L. is only A.R.A. at present; no doubt he would emulate his episcopal brethren, and as truthfully say, *Nolo episcopari*, with R.A. substituted for the last word. Holders of the same surname as his publish photographs, paint portraits in oils from photographs; and I think the "author of his being" had considerable practical acquaintance with the—craft, shall I call it? How could he be an R.A. if not thoroughly purged of the "damnable heresy" of photography as art? These valuable opinions of his are quoted from the *Magazine of Art* this month in an attack on the Copyright Act. I was glad to see the editorial remarks on this subject in THE BRITISH JOURNAL OF PHOTOGRAPHY. Some of the artists are doing their best to write our rights down, and are seconded in their efforts by some of the daily press. We must, indeed, exert ourselves, and induce the Copyright Union to keep awake; it has lately done valuable work indeed, but its previous methods were of a rather somnolent character.

Most photographers who have had much to do with publication

ork have an idea of who is referred to by the Editor of this OURNAL when writing of a certain outrageous example of the rate editor. It has occurred to me to wonder whether he has not one in for piracy with the intention of —to mix my metaphors— riding for a fall." Then he and his moribund periodical might ave an excuse for literary suicide. But where would the poor hotographer be who won his case and found himself saddled with is own hundred or two pounds of costs if this editor liquidated?

I have not said anything about the Exhibitions themselves. The oyal Photographic Society have the finest collection of photographs n their walls ever shown at a Royal Photographic Society Exhibi- on, and I can also congratulate their Committee upon the evident resence amongst them of a mathematician of very high calibre. I ave not finished my calculations yet, for I had only a few quires of aper left; but, so far as I have reckoned (·002 of a square milli- netre), there has not been the slightest deviation from mathematical ccuracy in the arrangement of the walls into centres and in the ilateral symmetry in the superficial area of the photographic ompartments, the whole forming an exquisite geometrical pattern. hat some very indifferent specimens of photography should be laced on the line, and some others, requiring close inspection for heir peculiarities to be seen, should be skyed, is not worthy of a noment's thought after such an achievement as I have just recorded. he Salon is distinctly superior to the last, and, on the whole, to the oyal Photographic Society Show. But there are several atrocities n its walls that should have been removed. I was particularly truck with one frame which contained, I thought, an example of ensitised albumenised paper kept till iridescent; but the catalogue howed me I was wrong, the stained paper represented quite a retty and poetical sentiment. There is, however, running through he whole Exhibition a strong sense of artistic feeling and sympathy, while there are now to be seen a much smaller number of extra- vagances than in the earlier Salons. They will always find admirers. hey much remind of a joke I once saw played in a billiard-room. he marker had been using some emery cloth to rub down the cues with far too rough a material for the purpose, but excellent for the unpremeditated joke. The dark emery was covered with the wool lust in strokes, and spots, and smears, and had assumed all kinds of fantastic shapes. Some one picked it up, pinned it to the wall with four drawing pins in a spot where it could not be closely scrutinised, and asked each new comer to describe it. The first comer said, "a waterfall," the next described it as a view of a pass in the Lake dis- trict, he knew it well, but forgot its name. I said I did not know what it was unless one of the rejected photographs from the Salon. And, after all, it was only a dirty little bit of emery cloth.

How very simple some explanations are when once made—such, for example, as the cause of comets, &c., in wet-plate negatives! What a capital idea of Mr. Chilton's, at the Manchester Society, to instruct some of the members in the causes of such defects in his paper on *Photographic Failures!* To the present generation, who never saw a plate coated and dipped, a little practical lecture of the kind is most valuable, for wet plates are not dead yet, though each day the process dry-plate makers are running them close.

Speaking of process blocks reminds me of a recent editorial reply to correspondents, referring to the superiority of some of the cheaper illustrateds over their brethren. I can bear him out in all he says. There is one ladies' paper which is an especial sinner. Its usual average number contains the grayest and dirtiest examples of process work yet published.

Mr. Dunmore is not by any means alone in experiencing the ill effects of impure hypo. Writing with no one person in view, I cannot help expressing my surprise that of all the hundreds of tons of hypo used every year so little care should be exercised in testing its purity. Thousands of tons are imported in this country that have been "made in Germany," yet, with one conspicuous example to the contrary, all such that I have seen have been wretched sophis- tications, in which sulphate of soda played a prominent part. Yet all these were vouched for by the wholesale dealers who supplied them as being of the very best quality. I always buy English hypo, made either in London or Newcastle, and it has uniformly been of the highest quality to my own knowledge.

In these days of Mahatmas and their congeners I should like to describe a photograph I have seen. It was an outdoor picture, in cluding figures which were those of the members of a family who were ardent votaries of Spiritualism. An amateur friend took a negative of the house and the three figures. Before exposing a second plate, a spirited conversation on the subject of the materialisa- tion of departed spirits took place, and a negative second was taken. When this second photograph was developed, the negative unmistak- ably presented a group of four people. I have seen it, and can vouch for the fact of the photograph being a non-"doctored" print of a garden and a house, with a group of four standing figures; yet I am most solemnly assured that only three living persons were present when the view was taken, and the photographer himself is unaware of anything unusual in his use of camera and plate. This is a hard nut for unbelievers to crack. Will any of them try?

FREE LANCE.

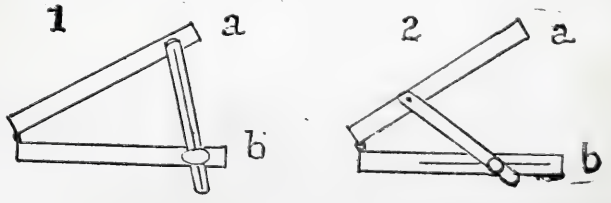
THE RENDERING OF PHOTOGRAPHIC DETAIL WITH TELE-PHOTOGRAPHIC LENSES.

[Photographic Club.]

ANY photographer who makes a study of architecture, or more particularly architectural detail, his hobby should include a tele-photographic lens in his outfit. The expense of fitting the negative element to a rectilinear lens is not great, taking into consideration the fact that the combination takes the place of a series of long-focus lenses. The tele-photographic lens gives a sharp image with any extension of the camera, and gives results equal to the work done with positive lenses. This slide represents part of the courtyard in front of the church of San Ambrogio, Milan. I wish you to notice particularly the capital of the nearest column. This is about as large as the nine-inch rectilinear lens would render it. The columns are, roughly, fifteen or sixteen feet high, and this photograph was taken about eight yards from the nearest one. Had this distance been diminished to any great extent to increase the size of the image, the detail in the capital would be so foreshortened as to be valueless. This slide is reduced from a half-plate negative. The next slide has been reduced in the camera to the same extent, and it serves to show the advantage gained by the use of a tele-photographic lens. It must be borne in mind that this was taken with a six-inch, as against a nine-inch lens, and that the magnification was only four, whereas five magnifications could have been obtained. The comparison is, therefore, too favourable to the ordinary lens. The next few slides represent capitals of other columns in this court; they are all about the same height from the ground as the first, and the magnification varies from 3·83 to 5·33, and the camera draw eight and a half to thirteen inches.

For a half-plate camera a six-inch rapid rectilinear, having an aperture of *f*-5·6 combined with a three-inch negative lens, will be found a handy size. With a draw of nine to ten inches (measured from the back of the negative lens to the focussing screen), this combination will cover a half-plate; increasing the draw increases the covering power of the lens, but diminishes its rapidity. The camera should be as strong and rigid as possible; it should be borne in mind that it must not only be firm at the ordinary focal length, but at its fullest extension—say, fourteen inches for a half-plate camera—and with a comparatively heavy lens in the front. Parallel bellows are very desirable, as conical bellows cut off part of the image, if the swing back is used to any extent on a vertical picture. The camera will often have to be tilted at an angle of 25° to 30° from the horizontal, so that ample swing in the back must be stipulated for.

A tilting table is a very great convenience and often saves much time, even when its use is not compulsory. It should be as strong as possible. There are two types here figured, No. 1 is the better form of construction. It will be seen, on referring to the diagram, that in No. 1 the support given by the slotted stays is most efficient when



working at the smallest angle. No 2 is apt to close automatically under these conditions; this is rather trying to the temper if ob- served at the time; but what if the unfortunate photographer finds

out the mishap when developing his negatives far from the scene of his labours? Always level the baseboard of the tilting table and get any tip required with its aid; the height of the object above the camera can then roughly be ascertained if a note is taken of the distance *a b* and also the space between the camera and the wall base. A small spirit level is very useful, and a two-foot rule must be included in the outfit.

Tripod.—The tripod must, like the rest of the apparatus, be strong and rigid. I use a twofold stand, with an eight-inch top, for a half-plate camera.

Plate.—A slow plate or film should be used, and the plate should be backed.

Practical work must now be considered. If the object to be photographed is high up, place the camera as far as possible away from it, to avoid foreshortening. If the camera is more than about 30° out of the horizontal, the resulting photograph represents largely the under side of the carving; the back must also be swung excessively. Now and then it is advisable to go further away from a comparatively accessible object, in order that the lens may cover the plate thoroughly; the *rationale* of this is that the longer the draw the larger is the size of the plate covered, and increasing the distance between camera and object will necessitate the use of a longer draw to keep the image on the screen the same size as before. Always swing the camera back until it is parallel with the principal plane of your subject; more often than not that will be to the perpendicular.

If possible, take photographs in diffused light only; it is a mistake to suppose that the brilliancy of the result is sacrificed by avoiding direct sunlight, and there is a distinct gain in the transparency of shadow detail. Do not let the sun shine on the lens during the exposure; if it is pointing towards the sun, shield it. As the lens only takes in a narrow angle, there is less danger of spoiling the plate with energetic efforts.

Exposure.—The estimation of the exposure cannot well be judged by observing the brightness of the image on the screen of the camera; a sensitometer should be used to test the value of the light. The sensitometer should be one of those in which a piece of sensitive paper is exposed to light to match a standard tint; the time this occupies is one of the factors of the exposure.

After testing the light, if not exactly where the object is, at any rate under as similar circumstances as possible, the next step is to find the intensity of your lens. I prefer the second plan mentioned in Dallmeyer's list; it is simple in practice, and is, besides, mathematically correct. Ascertain the distance from the negative lens to the focussing screen, divide it by the focal length of the negative lens, and add one to the result, and this gives the "magnification." Multiply the *f* value of the open aperture of the positive lens by the magnification, and the product is the initial intensity of the combination expressed in the same terms. Most photographic annuals have a table giving the relative exposures required with various stops "compared with the unit stop of the uniform system of the Royal Photographic Society." Cut this out and mount it on a stout card.

A proportion sum must next be worked out to find the right exposure. It is best to work to one standard; all my calculations were based on the standard of *f*-5·6, that being the largest aperture of the positive lens. The correct exposure for carvings in fair relief, with a tele-photographic lens, whose intensity is *f*-5·6, is about three per cent. of the light as given by the sensitometer with which I work; these instruments vary in the speed of the sensitive paper employed, but with a few trials a proper percentage can be ascertained. If the area covered is large, say the side of a house, this exposure would be too great; similarly, if the object is four feet by six feet, and taken so as to cover a half-plate, three per cent. would be quite insufficient. Similar variations occur in ordinary work, so that very little extra practice is required to gauge the percentage with sufficient accuracy.

The following formula will best explain the calculations needed to ascertain the exposure. L = the time value of the light as given by the sensitometer; A = the uniform system number of your standard aperture; B = the uniform system number of the combination in use; C, the percentage chosen. Then the exposure equals $\frac{C \times B \times L}{A}$.

Example.—A capital from San Ambrogio. Lens in use a 6-inch positive, working at *f*-5·6 and 3-inch negative element; distance from negative lens to screen, 13 inches; light, 20 seconds; the magnification $= \frac{13}{3} + 1 = 5{\cdot}33$; intensity $= 5{\cdot}33 \times 5{\cdot}6 = f$-29·8; U.S. No. = 56; L = 20; A = 2; B = 56; C = 3¼ per cent. The exposure for the open aperture $= \frac{3{\cdot}25 \times 56 \times 20}{100 \times 2} = 18{\cdot}2$ seconds. As, however, the positive lens was stopped down to *f*-22, the exposure was increased to 4 mins. 56 seconds. (Strictly this should be 4 mins. 51 seconds).

Here is another example of a different class. The light was estimated at 5 seconds; the draw, 12¾ inches; the magnification, 5¼; intensity of the combination, *f*-29·4, equal to U.S. No. 54; percentage, 2¼; exposure, 1½ minutes; positive lens at *f*-32. The camera was tilted 15°, and the back swung to the perpendicular. The plate was considerably over-exposed; probably three-quarters per cent. would have been ample. This photograph was taken fifty yards away from the wall base, and the subject was about forty feet above the level of the camera.

Little need be said about the development of negatives. Dallmeyer recommends hydroquinone or pyro-ammonia with pyro in excess. My experience has been almost entirely with isochromatic plates, for which I used a pyro-soda developer. Where exposures had been correct, there was no difficulty in getting strong negatives with the normal developer-makers' formula.

I fancy that there is not much need of stopping down the positive lens, though I have not really tested this point. These two slides are from negatives taken, one with the positive lens as *f*-5·6 and the other *f*-22. Both negatives received the same time exposure, viz., 90 seconds. The subject unfortunately was very much on one plane, so that but little depth of focus was required. The camera was tilted, and the back swung considerably, but I omitted to record the amount of the tipping.

It is, I believe, a prevalent opinion that photographs taken with tele-photographic lenses will not possess definition as sharp and clear as an ordinary lens yields. If the apparatus used is fairly strong and rigid, and sufficient care is taken to focus sharply, I do not think there would be any practical difference on this score between the two systems. I trust the few examples I have shown you will bear out this statement.

The great advantage that tele-photographic lenses offer is their adaptability to varying focal lengths; but, as rapidity is sacrificed in exchange, they are better suited for architectural work than for more unstable subjects.

E. Marriage.

PHOTO-MECHANICAL NOTES.

Would it be safe to predict that, in a very few years, the bichromate salts will have been almost, if not entirely, superseded in photo-processes by the salts of silver? It is, as the late Mr. Bright once said of a Government policy, "a large order," but, to my mind, it is by no means an impossible eventuality. It is now something like fifty-six years since Mungo Ponton described, in the *Edinburgh New Philosophical Journal*, "A New Photographic Paper, in which the Use of any Salt of Silver is Dispensed With," and that was the genesis of all bichromate processes. Vast progress has been made in photo-mechanical work during all these years as a result of that invention, and so wide is the knowledge of the properties of the chromic salts, and so high the degree of perfection attained in their application, that it might be said that practically nothing more is to be expected from them. Take from all formulæ the chromic salts, and process work would be chaos. Yet, in spite of this apparent universal utility of the bichromates, I venture to hazard the statement, that in nearly all processes the silver salts might very well replace the bichromates, and with advantage. It is, in fact, not by any means improbable that there may be a strong tendency in that direction in the near future.

The present-day process workers seem to have quite overlooked the exhaustive researches of Mr. Leon Warnerke, over fifteen years ago, into that property which gelatine-silver emulsion films possess of becoming insoluble after exposure to light and development with pyro, so that the parts unacted upon could be washed away with warm water. Mr. Warnerke showed at the time that such a process might be utilised for carbon printing (a pigment being introduced into the emulsion); for the production of Woodbury reliefs, for photogravure, photo-etching, photo-litho, and collotype. The last-mentioned application was followed up by some elaborate researches of Captain Pizzighelli in conjunction with Dr. Eder, demonstrating that an unfixed gelatino-bromide plate has the property of attracting fatty ink, so that, if a positive is made, it may be inked and impressions taken in the press by the collotype method. A similar idea has been quite recently patented in this and other countries, but whether the new method is sufficiently different to enable the patent to hold good I cannot say, not having seen the specification, but I have seen results which are remarkably in advance of ordinary collotype.

I don't know how far Mr. Warnerke carried out the collotype idea, but Captain Pizzighelli worked out his method quite practically. He said: "A negative simply developed, then treated with a chromic salt, printed from the reverse side, and washed, was found to possess on fixing the necessary grain. For the chromate solution the proper strength was found to be 900 parts of water to thirty parts of potassium bichromate. This solution must be kept as cool as possible; if necessary, by means of ice, and the negative, after being well washed, is then, either in a wet or dry state, bathed in it for about fifteen minutes. It is then allowed to drain, and all excess of the solution is removed by dabbing with a soft cloth. Being then placed in a well-ventilated room at the ordinary temperature, it will dry in the course of a few hours. In order to print it, the negative is placed, as in the usual copying process, in a printing frame, and covered with ordinary sensitive paper. It is then exposed to the action of light until a faint image of the *cliché* appears on the sensitive paper. On account of the yellow colour of the chromic salt, and of the silver bromide still remaining in the negative, the printing takes a considerable time, and sometimes lasts over a whole day. So soon as it is complete, the negative must be washed, and after the yellow tint, due to the chromate, has been got rid of, it is fixed in the usual way. . . . I take the negative, after it has been treated in the way above described, and immerse it in a solution of one part potass bichromate, and three parts hydrochloric acid in 100 parts of water, leaving it there until the black colour has entirely disappeared—that is, until the whole of the silver has been converted into chloride. The negative must then be washed, and afterwards fixed a second time. This has the effect of dissolving all the silver chloride, and no silver remains on the plate, nothing but pure transparent gelatine, in which the picture, as in a collotype plate, is only visible by means of the grain. After the plate has been again washed and dried, it may be used for printing from with a fatty ink like an ordinary collotype plate. Instead of washing the negative after it has been printed, it may be at once plunged into the solution for getting rid of the colour as described above, and by this means the double operation of fixing can be dispensed with. If at first all the silver is not directly converted into chloride, the operation of discharging the colour and fixing may be repeated, in which case the washing between the two manipulations need only be superficial."

The object of printing a faint image on sensitive paper, as described above, may not seem clear; but, in another part of his paper, Captain Pizzighelli indicates that it is simply a test for the amount of exposure of the back of the plate. He says: "By means of this exposure of the reversed side to light the transparent parts of the negative become horny, and are not affected by aqueous solutions, while the dark parts in immediate contact with the glass are rendered insoluble, though they retain the power of swelling up." The full article will be found in *Photographische Correspondenz*, September, 1881.

The above may seem a long story, but I quote it to show that there is nothing new in the idea of using an ordinary bromide of silver gelatine plate for collotype. Mr. Warnerke's original idea was decidedly simpler, though probably he did not contemplate using ordinary gelatine plates. His experiments related to his bromide of silver tissue, but his leading idea was the fact that the pyro-ammonia developer so tanned the parts of the film exposed to light that all operations analogous to those produced by the insolubilising action of bichromate could be performed. Thus it is conceivable that an ordinary gelatine plate, exposed and developed in the way described for his tissue, and left unfixed, would pick up ink in exact proportion to the action of light, so that it would, to all intents and purposes, be a collotype plate.

I do not think the other idea of utilising the same property for photo-litho transfer was ever carried out, yet it seems quite feasible and practicable. Of course, the applications of the Warnerke tissue to the photogravure and half-tone process are well known, and present no great difficulty; in fact, I consider the operations far easier than the ordinary bichromate methods used for these processes, and the results are superior in detail and softness when the requisite skill is attained and due care taken. A further advantage is, that the quality of the negative is not of such great importance as in the bichromate processes. In the latter, only one style of negative is permissible—that is to say, a strongly black and white contrast; but, with the silver salts, a much wider range is allowable between the extremes of good and bad. Above all, we abolish the tyrant daylight. With such a tissue as Warnerke's, it is quite possible to print by gaslight or paraffin lamp. Lately I have done some excellent half-tone prints with two minutes' exposure to an ordinary gas burner. This goes one better than sunlight, in which three minutes is about the least possible exposure with a bichromate film. The other operations are certainly not longer than for the latter. The developing takes two minutes with a correct exposure; the washing out of the unexposed parts about the same time.

I am afraid that too little attention has been paid to the possible applications of gelatino-silver emulsion films to photo-mechanical work, and those who have tried processes of this kind have been too apt to be disheartened by a few early failures. Here is a list of processes it is known to be adaptable to:—

1. Reproduction of negatives and transparencies with the same advantages as claimed for carbon process.
2. Production of positive prints on paper, opal, &c., as by the carbon process in pigments.
3. Vitrified enamels. Mr. Warnerke demonstrated its practicability, and described the method.
4. Formation of reliefs as worked out by Swan, Sutton, Liesegang, and others.
5. Making collotype printing plates.
6. Photo-litho transfers, either in line or reticulated grain.
7. Negative resist for photogravure plate.
8. Positive resist for half-tone process.

With all these possible adaptations, there seems hardly any other field to conquer. It only remains for process workers to set to work to apply the suggestions which have from time to time been made. An entirely new field is offered in process work, and, now that there is such a glut of mediocre production by existing processes, there is a good opportunity for enterprising spirits to strike out into something new.

WILLIAM GAMBLE.

BACTERIA IN GELATINE.

IN the columns of this JOURNAL, pp. 632-633, there appeared an abstract of an article on *Bacteria in Gelatine* the original of which may be found in the *Journal of the Photographic Society of India*.

Since the date when Ehrenberg's microscopical researches first proved the presence of infinitely minute living organisms in water and dust, the study of the characteristics of the *curriculum vitæ* of these exceedingly small bacteria has become of the greatest interest in the commercial as well as in the scientific world. Yet, whilst the fact of bacteria being active in gelatine solutions is not possessed only of a fascinating interest, but is of vast importance to the photographic industries, it is extremely doubtful whether manufacturers of gelatine-coated plates, papers, or films, have, as yet, realised either the nature or the degree of the destruction or marked deterioration which the presence of an invisible but ever-active army of microbia may exercise under conditions suited to their virility.

The old ideas concerning the spontaneous generation of germ life are now ideas of the past, laboratory research and commercial experience having proved again and again the absolute soundness of Pasteur's skilful elaboration of the vitalistic theory of fermentation. The investigations of many highly competent chemists and physiologists have conclusively proved that putrefactive or fermentative decomposition is due to the activity of bacterial agencies, and that such phenomena may be readily prevented by careful attention to simple methods of treatment especially designed to meet the requirements of various classes of material.

In the animal kingdom, as is well known, we find constitutions having so great an amount of physical vigour as to render them, in so far as microbial infection is concerned, almost invulnerable; so, too, in the inanimate world we find organic substances which, even under the most unfavourable circumstances, are possessed of a strong *vis inertiæ* against the invasion of putrefactive ferments, and gelatine, in the form of photographic emulsion, appears to fall within this category. However, the presence of bacteria in gelatine is by no means a recent discovery; in point of fact, since Koch perfected the method of using it as a moist nutritive substratum for the isolation of microbia *in situ*, bacteriologists have probably had no more familiar instance of rapid decomposition due to direct infection—aerial or otherwise.

It is but a little while ago that "Cosmos," with characteristic versatility, drew attention to the subject of bacteria in emulsions, and shortly afterwards I, myself, appealed, through the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY, to manufacturers of such emulsions to assist me in the elucidation of this problem, regarding which the erudition of the most learned is but scant. I regret to relate that my letter received but slight attention, as evidenced by the paucity of replies. At the same time, it is consoling to reflect that there are a few manufacturers sufficiently ingenuous to admit that at times they do experience apparently unaccountable difficulties in the preparation of photographic emulsions, and that the physical

appearance of such spoiled batches is strongly indicative of putrefactive change, due to microbial infection.

There are many sources whence these invisible but powerful microbial armies may arise, and, upon first consideration, one would almost expect excessive bacterial changes to be much more numerous; but, when we reflect that the chemical constitution of the emulsion is far from being that best suited to the physiological requirements of micro-organisms, it may be granted that its immunity from disease is naturally very great.

As a matter of fact, it is to acclimatised bacteria that the greatest damage may be credited, whilst it is conceivable that their baneful action may be dependent, to a very great extent, upon the mutual relations existing between the organisms concerned, or, in a word, to a symbiotic fermentation. By "acclimatised" bacteria I refer to such as have been derived from growths which have passed through many generations upon stray pieces of moistened gelatine or waste emulsion, and which, by reason of their acclimatisation, do not experience a marked change of environment when brought into contact with fresh emulsion. It is, indeed, only upon such an assumption that one can explain the great irregularity of the occurrence of highly infected emulsions, characterised by either hopeless fog or almost total loss of setting power.

Moisture is essential to microbial and fungoid growths, and a warm or high temperature in the absence of moisture is inhibitory to their development. It will thus be rendered manifest that sterile plates, films, or papers, are not necessary, and that to place such preparations upon the market would be a work of supererogation. Furthermore, from the point of view of microbial infection, the risk of a more or less extended decomposition is practically confined to the preparatory stage of their manufacture, or, in other words, to that period prior to the emulsion-coated surfaces being deprived of their moisture.

Plates carelessly stored in a warm, damp atmosphere cannot reasonably be expected to yield high-class results; and it is absurd to blame the manufacturer for producing articles which will not stand atmospheric conditions that would assuredly be fatal to almost every variety of organic substratum. In such places as Lower Bengal satisfactory storage is of much greater importance than modified films, and the solution of the former difficulty should give no trouble whatever. A neatly constructed air-tight compartment, provided with vessels containing lumps of fused calcium chloride, would obviate all danger arising from moisture in the outer air. Calcium chloride, being easily redried by heating in an oven, forms an exceedingly efficient and cheap substance for this purpose.

A. J. Banks.

LANTERN-SLIDE MAKING.

[South London Photographic Society.]

The Hon. Secretary (Mr. Oakden) gave a demonstration of *Lantern-slide Making*. He said slides were made in two ways—(*a*) by contact when a portion only of a negative was taken, and (*b*) by reduction when the whole or the selected part of a negative was included in the finished slide.

Slides by contact could be made by placing the lantern plate face downwards on the negative in an ordinary printing frame, and, after placing in the back, the plate was exposed to the light of magnesium ribbon, gas, or other illuminant which was convenient. He then described some of the frames placed on the market for contact printing to avoid the risk of breaking the negative, and suggested improvements in the one he considered the best. Slides could be made from all fairly good negatives, but those which were technically good were the easiest to work with. Negatives slightly inclining to thinness produced the best results. The lantern plates at present on the market had good qualities, but, in purchasing them, freshness should be insisted upon, as they rapidly deteriorated, and no one could obtain the finest results on stale plates.

Plates were usually classed as rapid for slides made by reduction, and slow for slides by contact. The rapid plates were usually described as giving black tones only, but in practice they gave a long range of black tones, the warmest often approaching a brown. These were the best plates to use when the negative was inclined to be hard. The slow plates gave warm tones and were sufficiently rapid to be used in reduction work, having been recently increased in speed. More contrast could be obtained by using these plates, which made them exceedingly useful when the negative happened to be too thin. There was a choice in the matter of developers, of which hydroquinone appeared to be the favourite, the formula being as follows :—

A.

Hydroquinone	80 grains.
Sulphite of soda	1 ounce.
Citric acid	30 grains.
Bromide of potash	15 ,,
Water, to	10 ounces.

B.

Caustic soda	80 grains.
Boiled water	10 ounces.

Use 1 part A, 1 part B, and 2 parts water.

Metol gave very good results, with less contrast than hydroquinone :—

A.

Dissolve in ten ounces of water metol	50 grains.
Add sulphite of soda	1 ounce.

B.

Carbonate of potash	1 ,,
Water to	10 ounces.

C.

Bromide of potash	1 ounce.
Water to	10 ounces.

Use 1 part A, 3 parts B, and 10 minims C.

Glycin produced very beautiful slides of bluey-black colour :—

Glycin-Hauff	75 grains.
Carbonate of potash	300 ,,
Sulphite of soda	300 ,,
Water to	3 ounces.

Use 1 part to 3 parts of water. Add a few drops of ten per cent. solution of bromide of potash in the case of over-exposure. It will not be required in case of correct exposure. A number of slides, with varying exposures, were then made, to illustrate the latitude of exposure. It was absolutely necessary, to avoid stain, to wash the slide after development and before fixing in hypo.

When slides were made too dense, they could be reduced by soaking them for a short time in the following solution :—

Solution of perchloride of iron B.P.	¼ ounce,
Hydrochloric acid	½ ,,
Water to	20 ounces,

and, after washing, immersing them in a fresh hypo solution. If sufficient reduction had not taken place, the operation could be repeated. If any scum formed on the surface of the slide, it could be removed by the alum clearing solution :—

Saturated solution of common alum	1 pint.
Hydrochloric or sulphuric acid	2 drachms.

Farmer's reducer (ferricyanide of potash and hypo) could also be used, but was liable to affect the colour of the slide if much local reduction was required.

Slides which were too thin could be intensified with uranium, which changed them to a red colour. Mercuric intensification was unsuitable for lantern slides.

Nitrate of uranium	15 grains.
Ferridcyanide of potash	15 ,,
Glacial acetic acid	1 drachm.
Water	5 ounces.

Place the slide in the solution until sufficient density is attained. If the intensification had gone too far, the colour and intensification could be discharged by placing the slide in a solution of ammonia, carbonate of soda, or other alkali, after which the intensification operation could be repeated. After intensification the slide was washed for a short time only in water acidulated with acetic acid to remove any yellow stain. The effects of reduction and intensification were demonstrated. Slides were rendered a little more brilliant by varnishing them when they were dry with enamel collodion or celluloid varnish, such as the Frena. A number of slides were passed through the lantern to illustrate the defects (stains) arising from imperfect washing after development and fixing, and the use of unclean dishes (spots), and also to contrast the results on fresh and stale plates.

The description of the apparatus used by the demonstrator for making slides by reduction stood over for want of time.

LENSES FOR PROCESS WORK.

[Process Work.]

We are afraid that the selection of a lens presents a problem of great difficulty in the minds of most process operators. It ought not to be so, for a very elementary knowledge of photographic optics would enable a decision as to the precise requirement to be arrived at. What makes the subject confusing are the advertisements and descriptions of the new German lenses, with such apparently formidable names as "anastigmat" and "orthostigmat," and the odd fractional apertures. The operator who has been accustomed to working a lens with apertures calculated from *f*-8 begins to feel a bit out of his depth with an aperture marked *f*-7·7; or, on the other hand, if he has a smattering of knowledge on the subject of stops, he immediately jumps to the conclusion that, *f*-7·7 being a larger

aperture than *f*-8, the lens in question must be more rapid. He therefore argues that, if he can get a lens with the extreme covering power claimed, whilst working at a larger aperture, it must be infinitely better than his "good old" Ross. Consequently he becomes dissatisfied with a lens which has done him good service, and probably has satisfied many other operators before him. Now, we do not wish our remarks to be taken as disparaging to the new German lenses, which are undoubtedly a great step in advance in optical work, and indeed possess splendid capabilities for reproduction, but we would point out that the importance of their qualities has been somewhat exaggerated, or rather, should we say, an exaggerated opinion has been formed of them. For line work it is not to be gainsaid that some series of the Goerz and Zeiss lenses are admirable, but for half-tone the character of the lens within very wide limits is not of great consequence. It will be remembered that, in the recently published investigations of Dr. Eder into the theory of the half-tone process, that *savant* recommended certain of the lenses of Zeiss, Goerz, and Steinheil. This would no doubt be taken as an authoritative pronouncement on the subject. We do not ourselves regard it at all in that light. Dr. Eder, experimenting no doubt with lenses at hand, indicated those he found most suitable, without intending to make an invidious comparison with all other forms and makes. Commenting upon this Mr. Max Levy—who, with all deference to the distinguished scientist, is at least a more practical authority—recently wrote in a foot-note to Dr. Eder's paper: "In our experience the character of the lens within very broad limits has been found immaterial. While we believe the lenses mentioned above are the very best obtainable for the work in hand, we should not consider it advisable to purchase a new lens where one already has a good lens of the rapid rectilinear type capable of giving a sharp image of the necessary size at an aperture of *f*-12 to *f*-14." The gist of Dr. Eder's remarks on the subject of lenses, ignoring specific recommendations, will apply to all makes, and he simply rediscovers by scientific method facts which have long been patent to most intelligent and practical half-tone operators. What he indicates is that a wide-angle lens is serviceable for line work by reason of its extended sharp field, but that in screen work, where a very large field is not required, but rather a very bright and sharp field of small angle, lenses of the rapid rectilinear type with efficient covering power give greater play for the enormously important variation in the size of the diaphragm aperture, for which reason he prefers objectives of relatively greater aperture. Before going further it is well to remark that the point has been raised of late as to whether the new German lenses are of relatively larger aperture than the older makes. English opticians follow the well-understood rule of making the diameter of the diaphragms a proportion of the focal length of the lens. Thus it is at once known that, if the largest stop is *f*-8, it has a diameter one-eighth the equivalent focus; but, if we apply this rule to a Goerz lens described as having *f*-7·7 for its working aperture, we find that its largest diaphragm is about *f*-9, the German optician having some different system of marking his diaphragms. Such differences must confuse those who are purchasing lenses, and it will equally upset calculations in actual practice. It is a great convenience, when using square or other shapes of stops, to know that the diameter of the round stops has a known proportion to the equivalent focus of the lens, and that each one smaller requires double the exposure of its larger neighbour. By making the square stops bear the same relation the operator knows at once the proportionate exposure between one stop and another, so that, if he uses two or three stops in the course of a single exposure, he will know the requisite time to give to each to produce the same density of dot on the negative. The matter of long-focus *v.* short-focus lenses is one that still puzzles a good many. It is customary to recommend that long-focus lenses are most suitable for half-tone, and this accords with the best experience. But some operator will argue with you that he uses a short-focus lens for his every-day work, and gets results that satisfy him. If he is of a very assertive disposition he will probably tell you that the recommendation of long-focus lenses is "all bosh," and only got up by opticians to enable them to sell larger-size lenses. It can, however, be mathematically and practically demonstrated that a long-focus lens will give greater depth of definition and less diffused light in the camera, whilst by giving a more lengthened cone of light, which cuts the screen apertures sharply, it will permit of a larger stop being used, thereby securing additional softness and less of the "raspy" screen effect. The operator who only aims at getting sharp screen dots on the plate does not notice these things. In deciding on the focus of a lens to be bought, the size of the studio and the length of camera extension should be thought of. Is is no good buying a 24-inch focus lens for all-round work if the studio or camera swing is only 10 feet long and the camera bellows extension only 36 inches, for under such arrangements one could neither copy "same size" nor reduce anything smaller than one-fourth. For considerations of this kind operators ought to be more familiar with the rules of conjugate focus, or at least know how to apply one of the useful tables of enlargement and reduction which are to be found in most of the annuals and other books of photographic reference.

DRY PLATES FOR HALF-TONE WORK.

Mr. John Carbutt, the well-known plate-maker, writes to the *Photographic Times* as follows:—"Having read the article on half-tone engraving in the September issue of the *Times*, by Mr. Whittet, I cannot but feel surprised that one who writes as an instructor on so important a branch as photo-engraving should not have better informed himself on the use and capabilities of the gelatine dry plate, as now extensively used in half-tone engraving, in place of the old messy wet-collodion process. I can only conceive the article to have been written by Mr. Whittet before the illustrations from half-tone engraving on gelatine plates appeared a few months back in the *Photographic Times*, accompanied by an article by myself on the use of gelatine plates for half-tone engraving. If the illustrations referred to had only been a carefully worked-out experiment, there might be some reason in one writing as an instructor passing so lightly over the capabilities of the gelatine plate, when, as a fact, there are firms long engaged in the photo-engraving business who at first used the wet-collodion process, but gave up the use of it entirely, and substituted the half-tone process plate, and claim to do better work than with the wet process. What could be more simple and expeditious than for the operator to take from his shelf a box of dry plates, charge his plate-holder, and be ready to expose, as compared with the time, worry, and trouble to do the same as advised by Mr. Whittet, which takes six columns of the *Times* to describe how to do it by the wet process? The half-tone process plate has many advantages over the wet plate, of which may be named: they do no injury to the plate-holder or screen, and the latter may be placed, when desired, in contact with the dry plate; objects can be photographed direct through the screen, a great advantage when photographing manufactured articles for catalogues, &c. When a prism is used it, takes no longer to take and get ready the negative for exposing on the prepared copper plate than it does by the wet method. For the reproduction of portraits the gelatine plate gives decidedly better modelling than the collodion plate; and, finally, as the half-tone plate is made orthochromatic, it is proving of the greatest aid to three-colour printing in half-tone.

"For these reasons, if for no other, I thoroughly believe the dry plate will as surely replace the wet plate in photo-engraving as it has replaced it in general photography, and advise those taking up photo-engraving to begin with the half-tone process plate, specially prepared for that purpose."

DESCRIPTION OF A PHOTOGRAPHIC TELESCOPE EQUATORIALLY MOUNTED,

Having an Equivalent Focal Length of Two Hundred and Fifty Feet.

[Photographic Times.]

For obtaining the best astronomical photographs, the reflecting telescope should possess a great advantage over the refractor, for only by reflection can all the rays—both visible and invisible—of the spectrum, coming from a celestial object, be brought to a common focus.

With one or two exceptions, but little has been done in the photography of celestial objects having very small angular dimensions.

The photographs of *Jupiter*, taken with the great refractor of the Lick Observatory, and those of *Saturn*, taken with the Paris refractor, are of real merit, and probably represent the best results in this line so far obtained by astronomers.

In photographs taken with the refractor, the minuteness of the planetary (and similar) focal images, and the inherent defects of these images, due to the dispersion of the rays, will always tend to obliterate the details seen visually. These optical defects are still further increased when such focal images are enlarged in the telescope by means of lenses. For the enlarged image, the same defects, though in a much less degree, will exist when the focal image is formed by a reflecting surface and the enlargement secured by means of lenses. Another source of trouble in photographs enlarged by the usual methods is the coarseness of the picture, due to the enlargement of the grain of the plate. Evidently the photographs of the image enlarged in the telescope will be free from defects of this kind.

Some preliminary experiments during the past winter and spring made it evident that there were no good reasons why the enlarged focal image should not be wholly made by reflection, thus doing away with the inevitable dispersion of the rays caused by the use of lenses.

In the Cassegrainian (or Gregorian) form of telescopes the size of the focal image after reflection from the secondary mirror can be increased to any desired linear dimensions by simply bringing the secondary mirror to the required surface curvature.

During the early days of my connexion with the University of Michigan, I ground, polished, and figured a number of discs of glass, to be used as parabolic reflectors. Three of these are at present at the Lick Observatory. They have the following constants:—

Aperture.	Focal length.
8 inches.	6 feet.
12 ,,	4 ,,
18 ,,	12 ,,

All of these were mounted, at Ann Arbor, as Newtonians, on home

made equatorials; but, owing to the great amount of teaching in the University of Michigan, my time was so fully occupied that no systematic work was possible with these instruments.

In order to take full advantage of this method of securing very large celestial images to be photographed in the telescope without the use of lenses, the following conditions, at least, must be fulfilled:—

1. The reflecting surfaces must be of unusually perfect curvature.

2. The mountlng must be equatorial, very rigid, and the form either Cassegrainian or Gregorian.

3. The driving clock must have no short periodic variations of rate.

The eighteen-inch reflector was originally intended to be used as a Newtonian. To adapt it to the Cassegrainian form, it was necessary to cut out the cental portions of the mirror. While there was considerable danger that the figure of the mirror might be altered, I, nevertheless, took the risk, as there was but little probability that the reflector would be used as a Newtonian at the Lick Observatory. Accordingly, a concentric disc of the reflector, something over four inches in diameter, was cut directly from the central area of the mirror by means of a cylinder of thin sheet copper, the saw-toothed grinding edge of which was kept supplied with emery and water. The tool was held in a foot-lathe chuck, revolving several hundred turns per minute, while the reflector was vertically mounted in a stationary frame, which could be pressed against the grinding tool.

An immediate test of the mirror after the removal of the central disc showed that no sensible alteration of the figure had taken place.

As the only practical way to bring the secondary mirror to the proper figure is by actual trial on celestial objects, it was essential, first of all, to have the large mirror mounted equatorially. In designing the form of mounting, great rigidity of all the parts was constantly kept in view.

The thirteen-foot tube was originally made of half-inch boards, bound with iron. Owing to the disturbing effect of the wind, this wooden tube was later on replaced by three iron pipes screwed into plates fastened to the support of the large mirror. The upper extremities were connected by a rigid iron ring, which also served the axis of a fork for clamping the telescope. This skeleton tube is supported near the middle of its length by a cubical box having two opposite bearings which form the declination axis of the telescope. This axis is, in turn, supported by a rectangular iron frame, which revolves in two other bearings corresponding to the hour axis, after the plan of the old English mountings.

The upper pivot of the hour axis is four inches in diameter, and rests in a brass Y fastened to the top of a rigid triangular wooden frame, which is inclined to the horizon at an angle equal to the co-latitude of the place. The lower pivot is only three-quarters of an inch in diameter. It revolves in a steel bearing, and abuts against a brass plate, which takes up the end thrust.

On the iron ring connecting the upper ends of the tube are two opposite bearings, in which swings an iron fork, the handle of which passes through and can be clamped (in declination) to a collar in the hour axis at the lower interior side of the cradle. To this same collar the handle of a second fork, hinged to the eye end of the tube, can also be clamped.

The diurnal motion is secured by means of a governing clock, acting on a 15° sector of nearly ten feet radius. This sector is fastened to the outer end of a trussed iron frame, one of whose legs encircles the upper pivot of the hour axis, while the lower pivot of the hour axis passes through the lower leg of this sector frame. The tube is clamped (in Right Ascension) to the sector by means of an iron rod (pipe) which turns in a ball-and-socket joint on the west axis of the declination fork. Near the joint this rod is bent through an angle of about 30°, so that the inclination of the rod to the tube can be varied through an angle of 180°. This rod runs through and can be clamped to a collar on the sector frame near its outer extremity. A second rod (extensible) connects the sector with eye end of the telescope. The action of gravity on the sector frame is the motive power for running the clock.

For large western hour angles a shorter rod is screwed into the ball portion of the joint, in place of the longer rod.

The advantages of this form of mounting are:—

First.—The upper and lower ends of the hour axis are mounted on separate piers, thus giving great stability to the axis.

Second.—The moving tube is continually supported and braced in eight different directions, viz., the two supports forming the declination axis, the four supports given by the forks for clamping in declination, and the two right ascension rods running to the sector.

Third.—The great radius of the sector diminishes the errors due to irregularities in the running of the clock.

The driving clock forms part of one of the Lick Observatory chronographs, and was placed at my disposal by Professor Holden.

For experimentiug, a number of ordinary double convex lenses, about four inches in diameter, and having focal lengths of from one to twelve feet, were procured. All of these surfaces gave, by reflection, either blurred, distorted, or multiple images when placed in the best position on the axis of the eighteen-inch mirror used as a Cassegrainian. In the work of refiguring the surface of one of these lenses, which gave an equivalent focal length of about eighty feet, I found it indispensable to have some convenient and rapid means for adjusting both the large and secondary mirrors. Accordingly, the longitudinal slots were cut in the iron tubes into which the three thin steel blades which support the secondary mirror project. These blades are fastened to wooden rods which run to the eye end of the tube, where, by simply turning a hand wheel, a slow motion toward or from the observer can be given to any one of the three supports of the secondary mirror.

The pan containing the large mirror is supported at three equidistant points by thumb-screws which pass through the lower (closed) end of the tube. By turning these screws the inclination of the large mirror can be changed at will.

The first surface figured required many hours of local polishing, the mirror (secondary) being tested on celestial objects at intervals, until the rays reflected from the large mirror were ill brought to the same focus. To test the photographic advantages of this system, one of the most difficult of the celestial objects, giving the finest details for testing—the planet Saturn—was photographed, with exposures varying from one to fifteen seconds. The character of the results obtained at once showed that much larger images than those corresponding to a focal length of eighty feet could be advantageously photographed.

Accordingly, I at once commenced correcting another surface which gives an approximate focal length of 250 feet. Patient polishing and repeated testing in the telescope resulted in a surface which forms even better images than the first one figured. The surfaces were all silvered by Foucault's process.

On the trial negatives Saturn's outer ring is something over six tenths of an inch in diameter. The difference in brightness of the outer and inner rings, the shadow of the planet on the rings, the shadow of the ring on the planet, the cr ape ring, the belts on the planet, are all shown on the photographs.

Portions of the moon have also been photographed, and some of these preliminary negatives. enlarged to a scale of thirteen feet for the moon's diameter, compare favorably with the best results so far obtained with the most powerful telescopes.

At present the instrument is mounted in the open air, so that, in spite of the rigidity of the parts, the effect of the wind, plainly seen in the slightly shifting image on the gr ound glass, is such that the best results can only be expected after the instrument is enclosed in a building. Until this is done it is inadvisable to make another secondary reflector giving still larger images.

Since the work on this teles cope was commenced, a number of articles (by Mr. Common and others) have appeared, on what has been called a *skew* Cassegrainian telescope. It is safe to say that no large reflector used in this way will ever give as good results for full aperture as it would with its axis coinciding with the optical axis of the telescope. In the April number of the *Monthly Notices* of the Royal Astronomical Society one observer (Mr. Brooks) goes so far as to say: "I would here call attention to the fact that the correction of distortion caused by the tilting of the large speculum can be corrected by the proper tilting of the small flat mirror, as well as if it were convex." Now, it can easily be demonstrated that the image reflected from a plane mirror will have precisely the same form (neglecting reversals) as that which would be formed if the rays were allowed to come to a focus without secondary reflection; that is, the form of the image remains unchanged whatever the inclination of the plane mirror may be. A distorted image cannot be corrected by reflection from a plane surface; and it would seem that only by a happy accident could the distorted image from a large surface be completely corrected by reflection from a second curved surface.

PROF. J. M. SCHRABERLE (Lick Observatory).

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

A MEETING was held at the rooms of the Royal Photographic Society on Friday evening, October 11, Mr. A. Mackie in the chair, "to consider and accept the resignation of several members of the Committee, to appoint successors, or, in the alternative, take steps for winding up the Association." The public had been invited, but the only persons who attended the meeting were members of the Association, twelve in number, nine of whom were members of the Committee. The Hon. Secretary read the resolutions of several members of Committee who had resigned

their positions because of the apparent hopelessness of the effort to continue the work of the Association. The resignation of the Hon. Solicitor, which was pressed on the grounds of inability to attend properly to the work of the Association, was accepted. The other resignations were considered *en masse*, and, as the Chairman agreed to take discussion before a definite resolution was proposed on the subject, Mr. L. C. Brooks said that, as a non-member of the Council, he would like to ask the reasons for the resignations, and whether they were due to any friction between the members of the Council.

The Hon. Secretary practically replied in the terms of the statement recently made in our pages, that most of the members of the Committee had been desirous of retiring some years ago, but had been practically forced to retain their positions from their inability to find other persons sufficiently interested in the work of the Association to attempt to carry it on. Some three or four months ago the funds of the Association were completely exhausted, and the ordinary means of raising interest seemed to have failed. The position was then carefully considered, and the Committee decided to make an urgent final appeal. This had been done with such utterly inadequate response that the Committee had decided that it was hopeless for them to attempt to carry on the work, and, in order to bring the matter to a crisis, and elicit any public support that there might be, they had decided to call this meeting, and formally tender the resignations of all who were present at the meeting that decided upon it.

Mr. H. R. Hume spoke strongly of the good work that the Committee had done in the past, and said that he, for one, was most anxious that a new and strong Committee should be formed, if it were at all possible.

The Hon. Treasurer (Mr. J. Spiller) reported the result of the Society's work during the six years of his treasurership. He spoke of the increasing difficulties of obtaining money and help, which had been simultaneous with increased demands upon the Association and its increasing usefulness. He said that of late years the bulk of the income had been obtained by personal begging from a comparatively small number of firms, that each year these subscribers had more strongly objected than in the past to support an institution which was not supported by the class for whom it was intended, and he feared that it would be practically impossible, during the coming winter, to repeat the bulk of the subscriptions. Personally, he had never intended to hold the post of Treasurer for so long as he had done, and, if the Association had been more prosperous, he would have resigned his position some years ago, as pressure of other duties rendered it impossible to him to give full attention to it. It was absolutely necessary that he should withdraw from the work, and, so far, none of the members had been willing to undertake his duties, nor could they find any suitable person who was willing to do so. He very greatly regretted that the good work of the Association should cease, and hoped some means might be found for reviving it; but, under the conditions, he felt impelled to move the following resolution,—"That, in view of the apparent impossibility of carrying on the work of the Association, this meeting asks the resigning members of the Committee to retain their membership, and instructs the Committee to take all necessary steps for winding up the Association."

This was seconded by Mr. J. S. Rolfe, who said that he had been a member of the Association since its formation over twenty-two years ago, and had been a member of the Council for several years. He sincerely regretted that the abandonment of the work seemed imperative, but could see no help for it.

Mr. L. C. Brooks very strongly urged that, if the "Benevolent" ceased work, a "Charitable Fund" should be formed, and said that, in view of the great distress existing amongst photographers, it would be a good work for a small Committee to collect and disperse such funds as were obtainable, even if it were only 40*l.* a year. He thought that the "Benevolent" had failed partly because people could not get rid of the idea that it was a Benefit Society, and that, if the purely charitable object of its work were more generally known, it would be sure to have more ample support.

Mr. R. Y. Murphy supported this idea.

Mr. R. Child Bayley pressed the resolution, which was put to the meeting, and carried unanimously.

Mr. H. R. Hume proposed, and Mr. T. E. Freshwater seconded, that upon the winding-up of the Photographers' Benevolent Association the funds of the Association be offered to the Royal Photographic Society, on condition that they devote it to benevolent purposes.

The Chairman explained that the sum of nearly 300*l.* belonging to the Pension Fund was one which the Benevolent Association only held in trust, and could not deal with. He thought, on the winding up of the Association, it would be possible, with the approval of the Registrar of Friendly Societies, to apply this sum to other purposes than those for which it was now available, and for which it seemed never likely to be needed.

The resolution was put to the vote, and carried with one dissentient.

Before the chair was vacanted, Mr. L. C. Brooks again raised the question of the possibility of continuing the Association or starting a new organization which should be quite independent of any Society having other aims.

The Chairman said that the present Committee would be most happy if they could see any way to continue the work of the Association, and, as a step towards that end, asked Mr. Brooks and Mr. Murphy to accept two of the positions left vacant, which the Committee had the power of filling. He said that, if other suitable persons volunteered to take on the work, no doubt other members of the Committee would be glad to retire in their favour, and thus a new Committee would be gradually formed. In the mean while, the present Committee would be bound, by the resolution just passed, to take steps for the winding up of the Association.

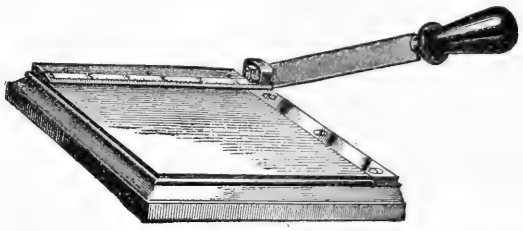
After the General Meeting, a Committee meeting was held, when Messrs. E. C. Brooks and R. Y. Murphy were elected in the place of Messrs. W. Fenton-Jones and William Edward Ward, resigned.

Our Editorial Table.

The Skate Blade Print Trimmer.

R. & J. Beck, Limited, 68, Cornhill.

Messrs. R. & J. Beck are introducing a useful piece of apparatus, a print trimmer worked by means of a skate blade, as shown in the illustration. To use it, the print to be trimmed is laid on the board



against the ledge shown at the upper part of the cut, which is divided off into parts of an inch; the part to be trimmed is allowed to project over the steel edge, and a downward motion of the skate blade cuts it off, leaving a clean and true edge.

We have made a trial of the trimmer and are pleased with it, as no doubt, many of our readers will be. It supplies a rapid, certain, and handy method of trimming prints.

The Wye Series of Photographs.

Marion & Co., Soho-square.

Continuing their publication of choice photographic work, Messrs. Marion & Co. are now introducing some charming views of river scenery by Mr. J. Kidson Taylor. The prints are on Mariona paper, and the matt effect obtained is specially fitted for this class of work. The mount is of high quality, a rough Whatman surface plate paper.

A specimen print submitted to us is of singular beauty and richness, and we are persuaded the series will be popular, the work of Mr. Kidson Taylor always commanding well-deserved admiration.

Lumière's Matt Bromide Paper.

Messrs Fuerst Brothers, of Philpot-lane, have sent us samples of this paper for trial. It appears to have what in our eyes is a recommendation, viz., a less degree of speed than is usually found in modern bromide papers. The results obtained were of a remarkably pleasing and artistic nature, using amidol as the developer, the shadows being soft and velvety, and the total result harmonious and effective. This matt bromide paper should be popular.

Mawson & Swan's Lantern and Transparency Plates.

Mawson & Swan, Soho Square.

We have received from Messrs. Mawson & Swan some of their transparency plates, stereoscopic ($6\frac{3}{4}\times3\frac{1}{4}$) size. They are of admirable quality, the nature of the emulsion being such that it yields pictures perfectly suited alike for lantern slides and stereoscopic transparencies. Full command is had over the colour of the image, which, according to exposure, ranges from black to warm brown. The plates are easy of development, and altogether can be thoroughly recommended as supplying the *beau ideal* of a lantern and transparency plate.

News and Notes.

Royal Photographic Society.—Technical Meeting, Tuesday, October 22, at 5A, Pall Mall East, at eight p.m. *The Art of Lantern-slide Making*, with illustrations, by Mr. John A. Hodges.

By a slip of the pen last week we referred to Mr. Wilfred Emery's carbon pictures on ivory as "tinted." We should, of course, have said painted. They, in fact, are fully painted, and very beautifully and artistically so.

South London Photographic Society.—On October 21 Mr. S. J. Beckett will deliver a lecture on *The Vatican, and Pictures from Italy*, illustrated by lantern slides, at Hanover Hall, Hanover-park, Peckham, at 8 p.m. Visitors are invited to attend.

The Sheffield Photo Company announce that their business of dealers in photographic and artists' materials, carried on for the last six years at 3, Fargate, will henceforth be continued at 95, Norfolk-street (formerly Priestley's), as the old premises, being required for the proposed street improvements, are to be demolished.

The Photographic Club.—The next weekly meeting of the Club will be held in the club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock, on Wednesday evening, October 23. Mr. Luboschez will read a paper, entitled *A Talk on Successful Portraiture and Platino-bromide Paper*, with illustrations. Visitors are always welcomed by the members. Professional photographers and others interested in portrait work should not miss this *Talk*. Mr. Luboschez was for several years chief operator to Falk, of New York, and has more recently been studying at the Paris Art Schools. His beautiful work with bromide papers is of quite an exceptional nature, and there is no doubt he can give some hints to even the most advanced workers. Free tickets of admission may be had from the Hon. Secretary, James A. Sinclair, 26, Charing Cross-road, W.C.

Mechanics' Institution Camera Club, Nottingham.—The Fourth Annual Exhibition, 1895, will be held in the Lecture Hall of the Institution on December 20 and 21, 1895. The Hon. Secretary is Mr. W. Edgar, 123, Clinton-terrace, The Park, Nottingham. Medals and prizes are offered for competition under the accompanying rules and regulations in the following classes:—Members' classes.—1. Landscape, seascape, or architecture. Three prints. First prize, value one guinea; second prize, value half-a-guinea. 2. Figure studies and *genre* subjects. Three prints. First prize, value one guinea; second prize, value half-a-guinea. 3. Instantaneous and snap-shot work. Four prints. First prize, one guinea; second prize, half a guinea. Open classes (amateurs only).—4. Landscape and seascape. Two prints. Gold and silver medals. 5. Figure studies and *genre* subjects. Two prints. Gold and silver medals. Nottinghamshire Survey Class (open to amateurs and professionals).—6. Places or objects of interest in Nottinghamshire. Three prints. Gold and silver medals. Entry forms and any further particulars will be given on application to the Hon. Secretary.

Sulphite of Soda in the Toning Bath.—Following out some experiments we made during the early part of last year, we now have pleasure in suggesting a slight modification of our toning formula, for use under certain conditions, where the necessity for the addition may be indicated by results. The modification consists simply in the addition of 2 grains of sulphite of soda to the 16-ounce toning bath as per formula. By its use any tendency to double toning is avoided, if such tendency is by any chance present. With Ilford P.O.P. this tendency is practically absent if the toning bath, &c., are in proper condition and our instructions carefully followed. The addition of the sulphite is most useful, and is specially advisable with Ilford Special P.O.P., which tones very rapidly. The action of the sulphite is to slow the toning and put it under more easy control, and with both papers it enables warm tones of all shades, perfectly even all over, to be obtained, if the prints are withdrawn at early stages of the toning. Judging the progress of the toning is done as usual by examining the prints by transmitted light. Care must be taken not to add a single grain of the sulphite more than mentioned, or toning will be stopped entirely. The addition of the sulphite does not in any way impair the keeping qualities of the bath for use a second time. The best way to make the addition is to dissolve 160 grains of sulphite of soda in 10 ounces of water, and add 1 drachm of this solution to the 16 ounces of toning bath.—*Photographic Scraps.*

Leytonstone Camera Club.—The Fourth Annual Exhibition and Competition will be held at the Masonic Hall, High-road, Leytonstone, on Thursday, Friday, and Saturday, November 28, 29, and 30, 1895. The Veronese band, under the direction of Signor Constantine Baga, has been engaged, and will play each evening. Lectures, demonstrations, lantern displays, and other entertainments will be given. The Judges are Messrs. Lyonel Clark, A. Horsley Hinton, and John A. Hodges. Twenty-three medals (one gold, eleven silver, eleven bronze) are offered for competition in the following classes:—Members' classes.—Silver and bronze medals: A. Landscapes and seascapes; B. Architecture (interior and exterior); C. Portraiture and figure study, including animals; D. Enlargements (which must be accompanied by a print from original negative); E. Instantaneous and hand-camera work (direct prints only); F. Lantern slides (set of six). Open classes.—G. Special champion class (for pictures that have already received awards), in which a gold, silver, and bronze medal are offered; H. Prints of all kinds by any process; J. Lantern slides (set of six). The Judges have eight medals (four silver, four bronze) placed at their disposal in classes H and J. Apparatus.—A silver medal will be given for the most useful apparatus sent in for exhibition. There will be no entrance fee in this class, but exhibitors will be expected to advertise in the official catalogue. Extra entry forms and all further information can be obtained from B. Harwood, Hon. Secretary, 110, Windsor-road, Forest Gate, E.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 18,424.—"Improvements in and Apparatus for producing a Flashlight applicable for Photographic and other purposes." Communicated by E. Hackh. T. Langgaard.—*Dated October*, 1895.

No. 18,753.—"Improvements in Photographic Enlarging Apparatus." Communicated by L. Gaumont. C. D. Abel.—*Dated October*, 1895.

No. 18,974.—"An Adjustment for the Lenses of Stereoscopes." Sir D. Salomons, Bart.—*Dated October*, 1895.

No. 19,014.—"The 'Beat-all' Improved Photographic Print Washer."—A. R. Boag and H. Anton.—*Dated October*, 1895.

No. 19,133.—"Improved Washing Tank applicable for Photographic Purposes." Complete Specification. D. Allan.—*Dated October*, 1895.

PATENTS COMPLETED.

Improvements in or relating to Magic Lanterns.

No. 20,095. William Henry Tomkinson, 81, Dale-street, Liverpool, Lancashire.—*September* 14, 1895.

This invention has reference to improvements in or relating to magic lanterns, the object being to enable the slides to be readily changed without loss of time. For this purpose I provide a slide-carrier, consisting of a frame of wood or other suitable material, the top and bottom members of which are grooved on their inner sides, the grooves being of slightly greater width than two slides. Along the centre of these grooves there are formed still deeper grooves adapted to serve as guides for a slide-changer formed of thin material, such as sheet celluloid horn or steel. The top and bottom members are secured together by suitable cross bars, arranged at a sufficient distance apart near one end of the carrier, to enable the picture on the slide to be fully exposed when placed in position between them. Curved springs are secured within the upper and lower grooves between these cross bars. They are secured to the rear walls of the grooves in such a manner that they tend to press and hold a slide placed in front of them against the opposite side of the groove. The wall of the upper groove is cut away on one side at the outer end of the carrier, to allow slides to be readily inserted in and removed from the carrier. The slide-changer is adapted to slide freely in the above-mentioned deep grooves in the slide-carrier into which the edges of the changer take, guiding it as it is moved to and fro. The inner end of this slide-changer is provided with a turned-over edge or hooks projecting in a forward direction, and on the opposite side of the plate at a convenient distance from its inner end is a projecting shoulder or abutment adapted to bear against the rear vertical edge of a slide.

The operation of changing the slide is as follows:—

Supposing one slide to be held in position between the cross bars by the springs, the slide which is to be substituted therefor is inserted in the outer end of the carrier, and the changer is then pushed into its guides in front of the plate. Upon the continued movement of the changer, the projecting shoulder or abutment on its rear side engages with the second slide, and carries it along with it until the said slide is in position behind the first and in front of the springs, the hook upon the opposite side of the changer having ridden over the latter. Upon drawing the changer backward, the second slide is left held in position by the springs, whilst the hooked portion of the changer engages with the first slide, and carries it to the outer end of the carrier. As soon as the changer and the first slide have been moved out of the way, the springs attached to the rear side of the grooves forces the second slide against the opposite walls of the grooves, and hold it firmly in proper position for use.

When the changer is formed of celluloid, horn, or the like, it may be employed as a dissolver without completely shutting off the light from the lantern in which it is employed.

With the above-described construction the slides can be inserted and withdrawn from the same side of the lantern.

Improvements in and in connexion with Mounts or Holders for Photographs.

No. 20,303. Robert Greir Evans, 45, Lower Mosley-street, Manchester. *September* 14, 1895.

A sheet of cardboard or similar material cut in various shapes and sizes, with openings formed in same to allow of insertion of photographs, the remainder of front or back printed with ornamental or other design, and on which calendar and name or advertisement of issuer or issuers may be printed. Other printed matter or design to be substituted for calendar when desired.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—The combination of photo-holding mount with calendar and the application of same to advertising purposes.

Exchange Column.

Will exchange quadruple enameller (10 inch) for grass mat and balustrade, &c.—Address, A. McCann, High-street, Uttoxeter.

Will exchange Lancaster's quarter-plate, "Le Merveilleux," for pocket Kodak or other hand camera.—Address, E. A. Green, 14, Colnbrook-street, Southwark, London, S.E.

Will exchange Lancaster's 1895 half-plate instantograph, complete, for Lancaster's quarter-plate, extra special set, or quarter-plate instantograph, with two dark slides and rapid rectilinear lens.—Address, F. W. Grist, 12, Speldhurst-road, South Hackney, London.

Want to exchange half-plate camera, suitable for studio or stereoscopic work, three dark slides and tripod, well made and strong, for a Kodak camera, taking picture 5×4, or half-plate, or Frena camera No. 2.—Address, E. Stamp, 44, Grosvenor-chambers, Deansgate, Manchester.

Wanted a rapid rectilinear half-plate portrait lens, giving perfect definition and quick, for indoor work, in exchange for a whole-plate bellows body-carrier (conical), by Jabez Hughes, and changing box (automatic), for twelve dry plates and two dark slides, one to fit changing box; all in good condition, and packing to eight and a half inches wide.—Address, W. S. Parry, 74, Corporation-road, Middlesborough.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
21	Camera Club	*Light in Photography.*—III. Captain W. de W. Abney.
21	Glasgow and West of Scotland	
21	Leeds Photo. Society	
21	North Middlesex	
21	Richmond	A Talk about the Exhibitions. Opened by P. Ennis.
21	South London	*The Vatican, and Pictures from Italy.* S. J. Beckett.
22	Birmingham Photo. Society	Sir J. Benjamin Stone, M.P., J.P., &c., will give an Address upon his recent Travels in Egypt, Syria, &c.
22	Brixton and Clapham	
22	Hackney	
22	Newcastle-on-Tyne & N. Counties	
22	Paisley	
22	Rochester	
22	Royal Photographic Society	*The Art of Lantern-slide Making.* John A. Hodges.
23	Ashton-under-Lyne	*The Different Kinds of Platinotype Printing.* Dr. Hamilton.
23	Croydon Camera Club	Photographic Chat.
23	Leytonstone	*The Preparation of Printing-out Papers, Collodio-chloride, and Rough-surface Silver Papers.* G. H. Moss.
23	Photographic Club	*A Talk on Successful Portraiture and Platino-bromide Papers.* M. Nahum Luboschez.
24	Bradford	Question Night.
24	Camera Club	*Photography from an Artist's Point of View—its Use and Abuse.* G. A. Storey, A.R.A.
24	Ealing	Ordinary Meeting.
24	Glossop Dale	
24	Handsworth	Demonstration on Photo-mechanical or Process Blocks. A. E. Segnitz.
24	Hull	
24	Ireland	
24	Leeds Camera Club	*Carbon Printing.* P. R. Salmon.
24	Liverpool Amateur	Lantern in Use for Members.
24	London and Provincial	
24	Oldham	
24	West London	
25	Birkenhead Photo. Asso.	*Dry Plates.* Percy Rae.
25	Cardiff	
25	Croydon Microscopical	*Experimental Search for Iron in Platinum Prints.* J. H. Baldock, F.C.S.
25	Holborn	
25	Maidstone	
25	Swansea	
26	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 10,—Mr. W. T. Wilkinson in the chair.

The HON. SECRETARY, referring to some remarks made by him at a previous meeting on the subject of certain insensitive marks on some negatives, prints of which only he had exhibited, passed round the original negatives for inspection.

Mr. JOHN TAYLOR, of the Autocopyist Company, gave a demonstration of the method of working the photo-autocopyist. The gelatinised parchment is sensitised in a bichromate bath, squeegeed on to a glass, and dried, after which it is printed under the negative in the ordinary way. One of the advantages claimed over collotype, which process it closely resembles, is that no actinometer is necessary. After printing, the bichromate is washed away in cold water until the yellow colour has entirely disappeared, when it is inserted in the stretching frame. A solution of glycerine ammonia, and water is used to keep the gelatine moist during the printing. The demonstrator passed round a frame showing the method of stretching the sheet and the effect of the printing on the gelatine. A quantity of ink is rolled up on a slab, the colour varying according to what process, whether silver, platinotype, or bromide, &c., it is desired to imitate. Two consistencies of ink were used, the hard for the shadows, and the soft, obtained by the addition to the hard of a little thinning varnished for the half-tones. The image is first inked with the hard, and afterwards with soft, ink, very little being required on the roller. Pulls from the sheet, made in an ordinary letter copying press after the first, or hard, inking, and also with the two inkings together were passed round, the former being hard and void of any half-tone, while the latter was perfect in this respect. It is recommended to damp the sheet with the solution between every three or four pulls to prevent it from becoming too dry. A single sheet will yield some 600 prints before becoming useless. All the negatives used were by the Hon. Secretary, and not specially prepared. A reversed negative is required, which should be soft and have plenty of detail, although it was explained that a lot could be done to remedy any unsuitable subjects by variations in the inking. A highly glazed surface, in imitation of gelatino-chloride papers, &c., is obtained by a coating of copal varnish. If required, the sheet, after yielding the number of pulls desired, could be put away for future use. Mr. Taylor, in reply to some questions, said that different atmospheric conditions had no effect whatever in the proper working of the process. A good many of the failures experienced could be traced to the use of unsuitable paper for printing, that with a hard, non-absorbent surface being the best.

The HON. SECRETARY considered the results shown very good. He also much admired the autocopyist for duplicating letters and drawings.

Mr. W. D. WELFORD thought the process compared very favourably with collotype, and was quite satisfied with the work he had done with it.

Mr. W. T. WILKINSON, while admiring the results, did not think that the process could be compared with collotype commercially.

PHOTOGRAPHIC CLUB.

OCTOBER 9.—MR. E. J. WALL in the chair.

Mr. Sinclair passed round some samples of Dr. Kreb's new palladium paper for printing out, and the members who took samples promised to bring the results to the next meeting.

Discussing the use of palladium for printing purposes, Mr. FOXLEE said the metal was expensive, and

The CHAIRMAN stated that, in his opinion, palladium could not be so incorporated in the sensitive surface as to be present in the final image, that is to say, that the picture would not be in palladium at all.

Mr. L. W. Tindall was proposed and seconded as a member.

Mr. Williams showed a negative—one of those brought to the Club by Mr. Welford for experimental reducing of the density. He had coated the back of the negative with collodion emulsion, had exposed it through the negative film, and afterwards developed with pyro and carbonate of ammonia. The result was a positive image when the whole was viewed by transmitted light. Judiciously carried out, he thought the method he had adopted would, in effect, reduce the contrast in the original negative, but the printing would be slower than ever.

Mr. Wilkes showed some sepia platinotypes on rough paper.

Mr. BYNOE (representing Messrs. R. & J. Beck, Limited, of 68, Cornhill) then showed the members the latest novelties which his firm have introduced. The skate blade prior trimmer, which is essentially the same in construction as a cardboard "guillotine," is a well-made device for trimming photographic papers to an exact size, and with straight, square edges. The board to which the blade is fixed is provided with a set-square and an inch measure. By this means pictures can be trimmed to any size, and the use of glass-cutting shapes is dispensed with. The workmanship of the trimmer appeared to be excellent, and the price 15*s.* for a seven-inch blade. Mr. Bynoe also showed the Frena film-holder attachment. This piece of apparatus, which has been now well tested in use, is arranged to hold forty cut films, and to change them automatically and in the field. Mr. Bynoe demonstrated the apparatus, which worked quite satisfactorily, and he illustrated the mechanism of the holder with the optical lantern and some very ingeniously constructed mechanical slides. In this way the members gained a complete knowledge of the details of the method of changing without having to wait for the apparatus to be passed round.

Answering questions, Mr. BYNOE said that his experience with films was that the most approved makes of films were as reliable as glass plates. In their first year's business they dealt with 750,000 films, and this number was now largely exceeded. Mr. Bynoe said good films had been, and could be, made of good quality, and it rested with the manufacturers to do it in a regular and businesslike way. The faults which existed in commercial films could hardly be ascribed to the celluloid itself, because some makers' films had them and not others, whilst the source of supply of sheet celluloid was identical. Mr. Bynoe said further that, to distinguish between the German and the American celluloid, the application of a hot iron was sufficient. With the American article the result was a softening of the film, whilst the German celluloid became powdery.

Mr. WALL drew attention to the fact that, in some films exported to South America, the packets which were not packed in soldered tin cases remained good, whilst others which were soldered up were found upon development to be useless, and

Mr. BYNOE said that Messrs. Beck had abandoned that method of packing entirely as disadvantageous. They packed in tin cases and made the final joints with surgeon's rubber plaister, which could be bought by the yard. The cases, closed in this way, could be opened and a portion of the contents removed, and then reclosed by any one.

A vote of thanks was passed to Mr. Bynoe.

Hackney Photographic Society.—October 8, Mr. J. Gardner presiding.—Work was shown by Messrs. Wilks and Roofe. Mr. Westcott showed a matt Solio print which had been produced on the glossy paper by rubbing down after it was dry with powdered pumice. The main portion of the evening was occupied by a discussion as to the best means of making Club outings attractive to the members. It was admitted that, with regard to the time of starting, if an hour were appointed which was the most convenient for the majority, the best part of the day would be gone.

ON Monday, October 7, a party of members visited the works of the Brin's Oxygen Company, and were greatly interested in what they saw there. The party was met by the courteous manager, Mr. Murray, who conducted the visitors round the works and minutely explained the details of the whole process.

THURSDAY, October 10, was the occasion of a visit of a party to the Eastman Company's Works at Harrow. The members were conducted round by the manager, Mr. Harold Senier, and were much interested, both in the various things they saw and in the explanations of Mr. Senier. One of the most interesting things seen was the coating of Solio paper. The machinery used for this purpose was most ingenious. Another interesting place was the enlarging room. In the presence of the party a splendid enlargement was made on the Company's bromide paper by means of a 300-candle power arc lamp, and developed with amidol. The following was the formula used: Amidol, 1 ounce; soda sulphite, 4 ounces; water, 80 ounces; bromide, ten per cent., a few drops.

Leytonstone Camera Club.—October 9.—The PRESIDENT, in opening the winter session, gave a short *résumé* of photographic progress during the past twelve months, and also reminded the members of the duty they owe to their Society in endeavouring to strengthen the hands of the Council by their support at the various meetings during the year. The judging of the various

prints taken during the September outings resulted in a tie for first position between Messrs. Bailey and Russell. Samples of Wellington & Ward's gelatino-chloride and bromide paper were distributed, and the SECRETARY explained the working of Davenport's new curtain slide-carrier for single lanterns.

Richmond Camera Club.—The first meeting of the autumn session was held on Monday, the 7th inst., when there was a very good muster of members and their friends to witness a display of lantern slides by the President, Mr. F. P. Cembrano, jun. In a few opening words, Mr. Cembrano touched upon some of the most recent improvements in apparatus, materials, and processes. He then showed a series of beautiful pictures on the screen under the title of *Rambles with a Camera*, comprising views in various parts of England and Scotland, scenes of rural life, shipping, and various other subjects, concluding with the newly medalled *World of Smoke*.

West London Photographic Society.—The members of the above Society have decided to hold their meetings in future at the Broadway Lecture Hall, Broadway, Hammersmith, where a comfortable room has been secured. It is hoped that the new headquarters being so easily accessible from all parts of West London will result in a large increase of the Society's membership. The first meeting of the winter session will be held on Friday, October 25, at the above address; photographers resident in the neighbourhood are cordially invited to be present. Proposals for membership may be sent to the Hon. Secretary, Mr. J. Stein, at 28, Martin's-lane, Cannon-street, E.C.

Bolton Photographic Society.—The first meeting of the winter session was held at the Society's rooms on Tuesday evening, October 8, when there was a good muster of members, Mr. J. E. Austwick presiding. The initiatory proceedings included the election of three new members and election of Auditors and Scrutineers for the year. The Chairman then called upon Mr. T. H. Heyes, teacher of the photographic class at the technical school, for a specially prepared paper on *Compressed Gases, their Storage and Usage*. Mr. HEYES dealt with the subject in an interesting and lucid manner, explaining the complete process for the manufacture of oxygen and hydrogen, the extreme care exercised in the manufacture of cylinders, the latest methods adopted in the compression of the gases, their use in the photographic art, and the dangers towards accidents and explosions, Mr. Heyes contending that, where cylinders had been thoroughly tested prior to use and proper care exercised in their manipulations, danger was reduced to a minimum. The members afterwards joined in an interesting discussion on points brought out in the paper, Mr. Heyes being warmly thanked for his contribution, on the motion of Mr. Galloway, seconded by Mr. C. K. Dalton.

Cardiff Photographic Society.—On Friday evening, before a large attendance, Mr. T. H. Faulks gave a demonstration on printing on bromide paper. A number of prints and enlargements illustrating the process were on exhibition, comprising work done by members of the Society, and also some very fine examples kindly sent by Messrs. Elliott & Son, of Barnet, and Wellington & Ward, of Elstree, an enlargement on tinted bromide paper by the latter firm being particularly admired. Sample packets of the paper manufactured by both firms were distributed, and a print on each paper from the same negative was made by the demonstrator, both of which were found capable of giving first-class results. Considerable discussion took place as to the best developers for the process, and the usual votes of thanks brought the proceedings to a close.

Fairfield Camera Club.—This Club held their ordinary monthly meeting on Wednesday evening, October 9, 1895, and, after the business had been disposed of, Mr. H. W. Searle gave a demonstration with his new A B C developer for the development of prints, obtaining, toning, and fixing prints in less than twenty minutes with perfect ease, and showing up in every way the fine qualities of his new invention, which promises to have a fine future before it. A hearty vote of thanks, proposed by Mr. T. E. C. Wilson, and seconded by Mr. H. Holt, was accorded to Mr. Searle.

Leeds Camera Club.—A goodly gathering of members of the Leeds Camera Club assembled at the Club's rooms, Brayshay's Restaurant, Bond-street, on Thursday evening last week, when Mr. A. GAUNT read a useful paper upon the merits of collodion for lantern-slide making. For the collodion process the lecturer claimed many advantages over the more generally adopted gelatino-bromide or gelatino-chloride processes. Amongst other points in its favour, that of absolute purity in the high lights is by no means the most insignificant, while varying tones from black to foxy red could be obtained after development by a simple toning formula. Mr. Gaunt described two methods of preparing the sensitive plate, and illustrated his remarks by a series of experiments. The first process treated upon by Mr. Gaunt was the double iodide of silver and ammonia, in which the sensitive salts of silver are combined with the collodion, the after-immersion in a silver bath (the usual mode of preparing wet plates) being unnecessary. The second process described was what is known as "washed emulsion:" A bromised collodion is prepared with zinc bromide and the usual quantities of pyroxyline, alcohol, and ether; to this a hot solution of silver nitrate in alcohol is added, and the emulsion thus formed allowed to ripen for twenty-four hours. The spirits of ether and alcohol are allowed to evaporate, the pellicle well washed, redissolved in ether and alcohol, filtered, and can then be used to coat the plates, which must previously be edged with a substratum of gelatine. These plates will keep fairly well for a month, are moderately rapid, can be developed by any of the fixed alkalies, and, if necessary, intensified with pyro and silver.

Plymouth Photographic Society.—This young club, which is scarce twelve months old, mustered in strong numbers at the opening night on Friday. The Hon. Secretary, Mr. R. Rugg Monk, gave a demonstration on the *Production of Lantern Slides*. Mr. Monk made the subject very interesting by producing slides of different tones, the plates used being Paget slow. Many present, who had not yet begun to make lantern slides, were much delighted, and the run on lantern plates for the coming winter will be possibly large.

FORTHCOMING EXHIBITIONS.

1895.		
Oct. 18–Nov. 2	*Photographic Salon	Alfred Maskell, Dudley Gallery, Piccadilly.
,, 18–Nov. 14	*Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
,, 28, 29	East London Photographic Society.	Hon. Exhibition Secretary, F. Uffindell, 29 Scrutton-street, Finsbury, E.C.
,, 28–Nov. 2	*Southport.	G. Cross, 15, Cambridge-arcade, Southport.
,, 29–Nov. 1	*Cheltenham Amateur Photographic Society.	Philip Thomas, College Pharmacy, Cheltenham.
Nov. 19–21	*Hackney.	W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 22–30	*Stanley.	Walter D. Welford, 59 and 60, Chancery-lane, W.C.
, 28–30	*Leytonstone.	B. Harwood, 110, Windsor-road, Forest Gate.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

EXPOSURE.

To the EDITOR.

SIR,—Most, if not all, exposure formulæ and methods take account of distance as a factor in a way that on the first blush has something paradoxical in it. From the fact that, the nearer the eye is to the subject, the more it perceives of shadow detail (to an extent that seems to exceed what may be due to the larger scale of the retinal image), it would not be unnatural to infer that the near view would be more active than the distant one in impressing the sensitive plate in the camera. The question seems worth closer examination and fuller exposition than, so far as I have seen, it has received.

Taking, as perhaps the most scientific, Mr. Howard Farmer's prescription, turning on "the distance of the nearest important shadow," and taking the exposure with such shadow at 10 feet as unity,—

10 to 30 feet is apportioned	$\frac{1}{2}$
30 to 100 feet is apportioned	$\frac{1}{4}$
100 feet to 100 yards is apportioned	$\frac{1}{8}$

From this we may take the proportionate exposure *at* thirty feet as $\frac{3}{8}$, and *at* 100 feet as $\frac{3}{10}$. Now, so far as the question of exposure turns on purely optical considerations, the "law" should admit of easy *quantitative* demonstration; and, unless some point escapes me, distance, *as such*, would appear to be *absolutely without influence* on the period of proper exposure. I imagine that, in a practically transparent atmosphere, this would be found to be practically the case. The *intensity* of the light received from any object at 100 feet distance will be only $\frac{1}{100}$ that from the object at a distance of 10 feet.

But, *per contra*, the rays from each square foot of surface at 100 feet will be focussed on an area only $\frac{1}{100}$ that which they would occupy with the object at 10 feet. In general terms, while the intensity of the radiated light varies inversely as the square of the distance, the area of the image formed by the lens varies according to the same law. In the case above stated, we have $\frac{1}{100}$ the light concentrated on $\frac{1}{100}$ the area, and the *intensity of illumination* of the image remains unchanged by the distance of the object.

The effect of distance in reducing exposure would, therefore, seem to be wholly due to the more or less perceptible atmospheric haze between the subject and the lens; and this must vary according to the condition of the atmosphere. On the supposition of uniform diffusion of haze in any particular case (a condition by no means universal), the *proportionate* effect of different distances of the subject should, so far as the light reflected by the haze only is concerned, admit of quantitative determination, though a little consideration will show that this is not quite a superficial problem. But there are the further points of the varying proportion which the light reflected (or transmitted) by the haze to the lens bears to that reflected by the subject, and of the varying amount of the latter which will be *intercepted* by the haze. The former, at least, of these elements must, again, vary with the *direction* of the incident light, and especially with the position of the sun as being (in popular parlance) "behind" or "before" the lens.

The combined effect of these (and perhaps other) considerations seems to prohibit any hard-and-fast rule of exposure turning simply on distance, and to suggest that the rule-of-thumb appreciation of "atmosphere" may, after all, be more exact than any rule based merely on distance. The "law," whatever it may be, would appear to be expressible in terms of *haze* rather than of *distance*. The subject is probably not practically worth the mathematical examination which

alone seems strictly appropriate to it; but, if for its theoretical interest it should appear to you worth handling, your treatment of it cannot fail to welcome to a large number of your readers.—I am, yours, &c.,

ROBERT G. WEST.

"*Ferndale*," *Queen's-road, Wimbledon, October* 8, 1895.

P.S.—I find I have imperfectly stated Mr. Howard Farmer's treatment of the factor of distance in determining exposure. The feature to be regarded is the distance of the nearest important shadow if the sun be shining on a portion of the subject only, and the distance of the nearest important *object* if the sun is not shining. The difference is not material for the point under consideration, but it is as well to be accurate.

THICK AND THIN GLASS.

To the EDITOR.

SIR,—I shall be glad if you will insert the following replies to the following correspondents :—

"ARTIST."—The name of maker of plates in question would, I am afraid, be of no use to you, as it is just the delightful uncertainty of never knowing when these thin plates are going to bob up serenely that makes it such a case of "pure cussedness." Perhaps half a box or one box will be extra thick, almost like plate glass, then comes an attack of thin, papery things, and in they go with the residues; the deposit is certainly very fine, but nearly all slow plates are so, and will bear enlarging to almost any extent. Should you wish to communicate with me, I shall be glad to send maker's name in confidence.

"EXPERIENCE."—The only class of photographers, I believe, who find weight, either in apparatus or plates, to seriously handicap them, are tourists or those travelling abroad. By all means in these cases use films; but as to *suitability of springs* it is not a question of *suitability* at all, as there is bound to be a certain amount of pressure in order to keep the paper in contact with negative, and when, with the least possible pressure consistent with contact, a carefully retouched and sometimes valuable negative bends in two, why, then I say, Give us suitable glass. I do not ask for *thick* glass, but I do ask for something thicker than one-twentieth of an inch for anything larger than quarters. I may be no prophet, but, if I can only keep free from influenza until films drive glass from the professional studio, I shall find life worth living, after all.

"C. L. S."—The variation between *my* thickest and thinnest plates appears to be somewhere about 200 or 300 per cent. Some I have cut up for watch glasses, others I have used for lights in the cellar flaps. However, I think my troubles are likely to be soon over, as the firm I deal with have promised to give the matter their attention, and, as they are, I believe, one of the largest of our manufacturers, I have great hopes for the future.—I am, yours, &c., PIETY.

SULPHITE OF SODA IN THE TONING BATH.

To the EDITOR.

SIR,—We are pleased to see that the Ilford Company are recommending the use of sulphite of soda with a view of preventing double tones in printing-out papers. The utility of sulphite as a preventive of double tones was a suggestion made by our Mr. J. B. B. Wellington at the Convention of the United Kingdom held at Shrewsbury in July last; and therefore we think that he should have the credit of being the first to bring this matter before the notice of photographers. Since then we have carefully made further experiments, and have conclusively proved that, to ensure absolute purity in the whites, permanency and absence of double tones with the combined bath, it is necessary that the prints direct from the printng frame should be placed in a thirty-grain solution to the ounce of sulphite of soda for ten minutes, thoroughly well washed, and then toned in the combined bath. The addition of the sulphite direct to the toning bath is not admissible, as it at once stops all process of toning unless in such small quantities that there would be little beneficial effect. The similar treatment of placing the prints direct from the frame into the sulphite will not answer with the sulphocyanide bath, as the prints absolutely refuse to tone. We do not recommend the employment of sulphite with the sulphocyanide bath as suggested by the Ilford Company, as not only does it slow toning, but the slightest excess of sulphite will immediately stop the process. In using the sulphocyanide bath there is practically no fear of double tones, at least that is our experience with Sylvio as now manufactured here.—We are, yours, &c., WELLINGTON & WARD,

Manufacturers of Photographic Papers.

GLYCIN.

To the EDITOR.

SIR,—As I have spoken in loud praise of the glycin developer, I must warn your readers that I have to-day had a sample which would not develop at all, though it was labelled glycine. The true article has a very powerful odour, which is unmistakable, once you have smelt it. The sample which betrayed me resembled the other, but had no odour, and was absolutely worthless. Any experimenter, getting a similar sample, would write me down a blockhead when he came to try it.—I am, yours, &c., W. J. STILLMAN.

A DEVELOPING COMPETITION.

To the EDITOR.

SIR,—Permit me to draw attention to a competition I have arranged in order to test some disputed points in development. I offer 10*l.* 10*s.* in prizes for the negatives which, cut in two and developed by different methods or developers, show the greatest contrast in printing gradation.

As this is in no way an advertising or trade competition (there being no restriction as to plate, developer, method of exposure or development), the Photographic Club have consented to nominate the Judges, and Messrs. F. A. Bridge and J. B. B. Wellington have kindly agreed to act. The conditions have also been submitted to the Club.

My own experiments point to the conclusion that control in development, however widely different the developers compared, is mainly confined to stage of development gained and control of fog.

Many photographers, however, claim that they have in development a much larger power of altering gradation, and to these I throw down the gauntlet and afford them an opportunity of proving their case. I think that they will be able to show slight changes in gradation, independently of fog and stage of development, but only in certain limited directions. I trust that experimenters who dislike competitions may still join in this non-advertising one, organized in the interests of truth.

Particulars, conditions, and entry forms (no fee) can be had from me or from the Hon. Secretary of the Photographic Club. Results to be sent direct to the latter by November 30.—I am, yours, &c.,

Imperial Mills, Hereford, October 12, 1895. ALFRED WATKINS.

"JUST ONE MORE."

To the EDITOR.

SIR,—While my friends are calling me the best-abused exhibitor of the year, I earnestly beg of you to give me a chance of explanation *re* No. 206 in the Salon. As a benighted provincial amateur, I was, of course, very pleased to get into the Catologue, but was sadly perturbed to read in one of the photographic journals such phrases as *chief monstrosity of the Show, too utterly imbecile, a record eccentricity*. Astonished and bewildered, I took up another review, and was further overwhelmed by *indescribable crudity and nebulosity*. I believe I guessed, even then, what had happened to the picture which had previously been so highly praised by men whose names I had been accustomed to associate with the best judgment. But I fought with my terrible suspicion till a third criticism realised my worst fears. *Behind the net is a cricket bat holding up a shirt-sleeve*. Then I knew for a certainty that the Committee had done me the cruel injustice of hanging my exhibit upside down. I ought, no doubt, to have indicated the top and the bottom; but, Sir, is my photographic past, present, and future, to be wrecked owing to this small omission on my part, and this crass stupidity on the part of the hanging committee? Surely the critics will give me yet another chance? I can scarcely expect that the magnanimity of the Salon authorities will rise to such a height as to reverse the frame now, and I can see only one way out of the gloomy cloud of censure which envelops me. Could the writers be persuaded, Sir, to take an inverted view of the picture? I cannot bear to think of our most capable critics being seen at the Dudley Gallery on their heads, but I venture to hope they will strain a point to do me this act of simple justice and mercy.—I am, yours, &c., JOHN GAMBRIL NICHOLSON.

PRINTING FRAMES.

To the EDITOR.

SIR,—*Re* article by J. Pike, *Printing Frames*, issue August 30. In 1890 I bought quarter-plate and half-plate frames, exactly as described, from a carpenter in the Aston-road, Birmingham, near the Cross. He told me he made for the trade. I forget his name, but perhaps some of your Birmingham readers will know him. He does (or did) a lot of work in photographic-apparatus making, so he may be known to others.—I am, yours, &c., H. HANDS.

THE LATE B. J. SAYCE.

To the EDITOR.

SIR,—I enclose copy of a letter received from the Manchester Amateur Photographic Society, which, if you could see your way to publish it, would show that they sympathise entirely with the movement we have started, and that we are not alone in our estimate of the late Mr. Sayce's work in connexion with photography.—I am, yours, &c.,

FRED. H. SCHIERWATER, *Hon. Secretary.*

Liverpool Amateur Photographic Association, Percy-buildings, Eberle-street, Liverpool, October 14, 1895.

"*Manchester Amateur Photographic Society,*
"*September*, 20 1895.

"JOHN HARGREAVES, ESQ.

"SAYCE MEMORIAL FUND.

"Dear Sir,—

"I have the pleasure to inform you that our Council have voted the sum of five guineas towards the above fund, and beg to enclose cheque to that amount.

We feel that our Society would not have had any existence, and very few of us would have enjoyed the pleasures of photography if it had not been for the unselfish conduct of Mr. Sayce and Mr. Bolton. We hope that you may have a very hearty and quick response to your circular, and so show in a practical manner that we wish to make Mrs. Sayce's path as free from large stones as possible.

"I have also started a list. Will send that later.—Yours faithfully,

(Signed) "CHAS. DAWSON."

THE HAMBURG EXHIBITION.

To the EDITOR.

SIR,—According to your notice in the JOURNAL of the forthcoming Hamburg Exhibition, I forwarded my picture carriage paid. I have now received the enclosed letter. I did not see any such restrictions of barring us professionals in the said notice of the above in the JOURNAL or any photographic papers.—I am, yours, &c., W. J. ANCKORN.

"*Hamburg, October* 8, 1895.

"I am very sorry not to be able to accept your picture, since we principally can only expose amateur photographs, as it has been expressed in the letter I wrote to the editors of the photographic papers of your country.—Yours truly, "ERNST JUHL, *Gesellschaft zur Förderung der Amateur Photographie, Vorsitzender.*

"*Mr. and Mrs. W. J. Anckorn, Arbroath, N.B.*"

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

J. TAYLOR HUGHES.—By all means send it.

WILLIAM HARDCASTLE.—Your trouble of blistering of Solio prints is most likely due to the ammonia. Try again without its addition.

MERTON.—The trouble is very common with some rollable films that have been kept for a long time. We know of no method by which such can be kept *perfectly* flat for exposure.

JAP.—We have some recollection of such a reference, but we believe the article has not been introduced into this country commercially up to the present. We expect you would have to import it for yourself.

A. Y. Z.—From the picture we can see no fault in the lens. The camera was not held still during the exposure. Try a picture with the camera on a stand or fixed to some rigid support, focus sharply, and see the result.

PIPER.—Although the reproduction was made abroad, it is certain to be copyright in this country. If you make lantern slides of the reproductions, it is an infringement of the copyright and subjects you to the same penalties as if the piracies were on paper.

OXON.—In photographing documents there is no difficulty, but it is desirable to use slow plates rather than quick ones. Such as those sold for photo-mechanical work are very suitable. If the manuscripts are yellowed with age, orthochromatic plates should be employed.

IGNORAMUS.—You cannot do better than prepare the developer according to the formula supplied with the plates. The developer used for wet collodion is of no use with gelatino-bromide plates. There is no analogy between the two processes, at least in the direction you appear to surmise.

INQUIRER (Darlington).—An article in the forthcoming ALMANAC will give full information on the subject. Better wait for that. Such information as could be given in this column would not be of any practical value to one who is quite ignorant of even the elementary part of the subject.

B. J.—The reason the carbonate of ammonia developer proved so slow in your hands is probably due to the use of an inferior sample of the carbonate, one that has been kept a long time and not well protected. We should advise you to work with liquor ammoniæ if you desire a pyro-ammonia developer.

J. W.—The mounts are decidedly at fault, and are the cause of the stains. If you wet the surface with a moistened finger, you will see how the brown pigment comes off. It is probably through this defect that you obtained the cards at so low a price. Be cautious of buying "job lots" in future without due examination.

E. EWINS.—In taking portraits with a short-focus lens, so that it has to be very close to the sitter, the perspective will be violent, as in the example forwarded. No lens will avoid this. The only way is to have a longer-focus lens, and get further off, or go further off with the lens you have and be content with a smaller image.

MONMOUTH.—1. The negative is too thin, from under-exposure, to print well. The only thing we can suggest is to intensify it with mercury. With care the negative should not be spoilt, as you say was the case with one you have tried. 2. Holes may be drilled in glass by a steel drill kept moistened with turpentine.

R. BROWNING.—The frequent occurrence of yellowness in the whites of the gelatine prints is most likely due to the use of the combined bath, and using it in not its best condition. Prolonged washing is also a source of yellowing in some instances. We should advise you to try toning and fixing separately, then there should be no yellowness, if care be used in the manipulations.

A CARTER writes: "In mounting prints on glass or enamelling them, I often have great difficulty in preventing air bubbles between the prints and glass. Could you give me any idea how this may be avoided?"—The only thing is to take care that no air gets between the print and the glass when they are laid down upon it. The gelatine should not be too thick, and air bubbles in it must be avoided.

W. G. STRETTON.—1. Possibly the markings are due to the staleness of the plates; but, without seeing an example, we cannot say definitely. 2. A camera of the twin lens type would be preferable. Several are fully described and illustrated in the advertisement pages of the ALMANAC. Of course, the cost is increased by the employment of a second lens of the same focus and good qualities as that with which the exposure is made.

T. HARRISON.—A small second-hand lithographic press, suitable for experimenting with photo-lithography, may be met with at the dealers in second-hand printing materials for from 3*l.* to 5*l.*, according to the size and usage it has received. Albion presses will cost something more, about double; but that will, of course, depend upon the size and the condition the press is in. If the press has seen much service, it may be dear at any price for collotype printing. Unless the platten is perfectly true, it will break the plates. This is a thing to be noted in buying a press for collotype work.

A. OGLEBY asks: "1. Where could I write for the book on the platinotype process, and what is the price, as noted in your last issue, which I have not at hand? I think it is by Captain Abney. 2. What will take nitrate of silver stains out of linen? In sensitising I have splashed some on collar, tie, &c."—1. The work is published by Sampson Low & Co., and the price is 2*s.* 6*d.* 2. The stains can be removed by treating them with tincture of iodine, which will form iodide of silver, and then with hyposulphite of soda, which will dissolve the iodide of silver. A strong solution of cyanide of potassium will also remove the stains.

H. H. (Pachmarlie C. P., E. India).—We do not at all like the form of studio shown in the sketch, and we do not think, as you say you are not a master in lighting, that it is well adapted for general all-round work, unless, indeed, it was made considerably higher, so as to give a very much higher side light. Would not the studio shown in the small sketch resist the monsoon rains if it had a much greater slope of the roof? It would be much more convenient for general work. The sun might be kept off by a shield of light boarding, or a canvas sail, placed along outside where the glass commences below the ridge. If the method answers, it would certainly be worth making public. We shall be glad to hear from you further about it.

S. G. E says: "Last week I had set up my camera to photograph a village church. The camera was in the public roadway; but, before I could make an exposure, the parson came out of his house, just by, and ordered me off, telling me if I wanted photographs of the church I could buy them at a shop in the village. I very naturally protested, but the reverend gentleman threatened to upset the camera if I persisted and stood before it all the time so as to hide the building. Was he acting legally, as I have always understood that any one may photograph a church without let or hindrance from any one provided it is taken from a public highway?"—The action of the clergyman was decidedly illegal. Our correspondent should have persisted, and, if the man had forcibly interfered, should have summoned him for assault. He would have been sure to be convicted. We are sorry our correspondent did not give the name of this militant parson and the village at which he preaches.

CONTENTS.

	Page
COLLODIO-CHLORIDE PAPER	657
THE USE OF THE SWING BACK IN PHOTOGRAPHY	658
DEVELOPMENT BY MEANS OF NASCENT HYDROGEN. By W. B. BOLTON	660
ON THINGS IN GENERAL. By FREE LANCE	660
THE RENDERING OF PHOTOGRAPHIC DETAIL WITH TELE-PHOTOGRAPHIC LENSES. By E. MARRIAGE	661
PHOTO-MECHANICAL NOTES. By WILLIAM GAMBLE	662
BACTERIA IN GELATINE. By A. J. BANKS	663
LANTERN-SLIDE MAKING	664
LENSES FOR PROCESS WORK	664
DRY PLATES FOR HALF-TONE WORK	665
DESCRIPTION OF A PHOTOGRAPHIC TELESCOPE EQUATORIALLY MOUNTED. By PROF. J. M. SCHRABERLE	665
PHOTOGRAPHERS' BENEVOLENT ASSOCIATION	666
OUR EDITORIAL TABLE	667
NEWS AND NOTES	667
RECENT PATENTS	668
EXCHANGE COLUMN	668
MEETINGS OF SOCIETIES	669
FORTHCOMING EXHIBITIONS	670
CORRESPONDENCE	670
ANSWERS TO CORRESPONDENTS	672

THE BRITISH

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PROCESSES FOR LANTERN-SLIDE MAKING.

Photographic societies generally are now in session, and with the majority of them the lantern is a very important feature. As a matter of fact it is a little difficult to conceive how some would find pabulum for their meetings were it not for this instrument. It may even be said, with regard to some societies, that they might be termed lantern societies rather than what is generally understood as photographic societies. Seeing the importance that the lantern has assumed, it is not at all surprising that several of the societies have opened the winter session with demonstrations of lantern-slide making. In the different demonstrations only two processes seem to have been dealt with, namely, collodio-bromide and gelatino-bromide emulsion. There are, however, several other processes by which equally as good—some say better—results can be, and are daily, produced, and which appear to have been, to a great extent, ignored by the lecturers.

This being the commencement of the lantern season, it will not be amiss to point out the different methods by which transparencies are made, and the advantages, or otherwise, they possess. If we look at the slides shown in the shop windows, we find that the majority of those of English make are by the wet-collodion process, and the larger proportion of those of foreign production by the albumen process.

The wet-collodion process yields pictures which are characterised by great clearness in the lights and vigour in the shadows. There is, however, a general tendency to a coldness in tone with wet-collodion slides, unless they are very skilfully produced or the colour is modified by after-toning; but, when well made, a wet-collodion slide shows excellently on the screen, and is not easily surpassed by any other method. Of course the wet-collodion process is only adapted for camera printing—a drawback with many.

For the albumen process, by which the greater number of the foreign slides are made, it is claimed by some, particularly old workers, that it is the one *par excellence* of all the processes for transparencies. It must be confessed that it is a very beautiful one, and the results produced by it have certainly never been surpassed by those of any other. With it any of the photographic tones, from a red to a deep purple or black, can be obtained. Prints may be obtained either by contact or by camera printing, though by the latter system a somewhat long exposure is entailed, as the plates are very slow, according to modern standards. A striking peculiarity of albumen transparencies is that the image partakes more of the character of a stain than of an actual deposit. It is this quality that gives the great transparency to the shadows, and for which albumen slides are so renowned. The unfortunate point in connexion with this process, from a novice's point of view, is that the plates are troublesome to prepare, and some skill, not to be acquired in working other processes, is necessary in the various manipulations.

The Woodburytype process is a most excellent one for the production of lantern transparencies. The pictures by it have very much the character, as regards the transparency of the shadows, of those by the albumen process. By this method the slides can be, after the mould is once obtained, more rapidly printed than by any other, which renders it specially suitable for commercial work where large numbers of the same subject are required. It has the further advantage that the pictures can be produced in any colour that may be desired. The working of this process, however, requires a somewhat costly plant, which puts it without the reach of the general run of amateur slide-makers. With the modified Woodburytype—Stannotype—a costly plant is unnecessary, but with it the troublesome manipulations involved in making the printing matrix are such as deter amateurs from taking it up when only a few slides of each subject are required.

In the carbon process we have an excellent method of making lantern transparencies. The manipulations are simple and easy to carry out now that the tissue is obtainable in a sensitive condition and ready for exposure. It is a little surprising that the carbon process has not received more attention from amateurs than it has, inasmuch as for some subjects it has advantages possessed by no other. By this method, like the Woodburytype, pictures in any colour, photographic or otherwise, may be obtained. Further, whatever may be the tissue's hue, its colour can be further modified by after-toning, or rather dyeing. It is thought by some that, in carbon slides, there is a lack of transparency in the shadows. If that really be the case, it is simply due to the proportion of pigment to gelatine in the tissue not being suitable for the work. Carbon tissue is not made specially for lantern work, though there is no reason why it should not be if a demand existed. It need not be mentioned that the carbon process is only adapted for contact printing.

Collodio-chloride yields most excellent transparencies, and, by toning, any photographic colour may be obtained; but it can only be used for contact work, as it is much too slow for camera exposure.

We now come to the two processes most worked by amateurs —collodion and gelatino-bromide emulsion. Both are equally as suitable for camera exposures as for contact printing, and either gives a wide range of tones. It is claimed for the former, by some, that it gives better results than the latter. That may be the case in the hands of highly skilled emulsion-workers, but not, we think, with the novice who has to prepare his own emulsions. Gelatine plates of such excellent quality are now on the market, and the results obtainable with them—even by comparative novices—so closely resemble those by the best of other processes, that we question if the average amateur, except for some special subjects, will trouble much about anything else. This opinion seems to be confirmed by what has taken place at the various demonstrations of making lantern slides that have been given of late. But, for all that, it is well to keep other processes in mind.

DEFECTIVE SKIES.

WHATEVER may be the advantages of extremely rapid plates —and in various directions they are many—there can be little question that, so far as the sky in general landscape work is concerned, the extra sensitiveness is a distinctly weak point. It is of no use talking about graduating the exposure by the use of sky shades and similar devices, or "dodging" the sky in development as remedial or palliative measures, available perhaps in occasional instances; the fact remains that in a very large percentage of ordinary landscape exposures the sky is defective, and calls for special treatment in the negative to rectify what cannot be set right during exposure and development.

There are, of course, vast numbers of subjects that can be, and are, successfully treated, as regards sky, with even the quickest plates, but these are of a class that do not come within the term "ordinary landscape," such, for instance, as marine views, or others in which sky, with perhaps a little water, form practically the whole of the picture, and in which the exposure is of the very briefest. There are also cases in which a well-lit landscape, backed by well-marked clouds, presents to the camera comparatively little contrast, and is consequently well within the capabilities of ordinary methods of exposure to render all portions of the subject in fairly due gradation. But, in order to produce the best character of result in the majority of outdoor views, "ordinary landscape" work in fact, an exposure somewhat longer than that known as "instantaneous" is necessary in order to properly impress the terrestrial portions of the scene, and if it be but the fraction of a second—an "off-and-on" exposure, in fact—it is far more than sufficient to secure any but the most strongly marked clouds, or even to give such density to the sky as will permit it to print of a fairly light tint. Too often—and this is aggravated in proportion as the plates are more rapid—the sky is solarised to such an extent as to be thinner than the middle tints of the landscape, and nothing goes so far towards killing an otherwise good picture as a sky that looks as if a thunderstorm were in progress.

Only a few weeks back we had an instance in which, though not using a specially rapid plate, the sky was so much over-exposed that the greater part of the landscape appeared in development before there was a trace of reduction in the sky, and it was only by entirely changing the developer, and considerable "dodging," that any deposit at all could be obtained. Of course, as it stood, the negative was completely valueless, and was utterly beyond the reach of any ordinary treatment in the way of intensification. The painting out of the sky in this case, too, was out of the question, as a portion of the sky line was broken up by extremely delicate architectural work, and the remainder by finely interlaced foliage.

Under such circumstances, there is but one method that can be adopted with any hope of a successful result, and that is the method known as the "dusting-on" process; but this is very little known or practised by modern amateurs, and, besides, its application to a negative of any value is a trifle risky, unless great care and circumspection be used. It is, however, far from presenting any insurmountable difficulties to a moderately careful worker if the subject is of sufficient value to make the end justify the means, and we propose, without entering into the general details of the process, to indicate the necessary precautions to be observed in applying it to the purpose under notice.

We may mention, for the benefit of those unacquainted with the process, that it is based upon the employment of a film composed of gummy or mucilaginous materials of a more or less hygroscopic character in combination with a bichromate salt. This film, which is hard and glossy when perfectly dry and warm, gradually becomes "tacky" as it cools and absorbs moisture from the atmosphere, and in that condition clings tenaciously to any pulverulent matter that may be brought in contact with it. In use, the dried and still warm film is placed in contact with a negative and exposed in the ordinary manner, when, by the action of the light upon the bichromated matter, it is rendered insoluble in proportion to the degree of action, and loses in like proportion its tendency to become "tacky." After exposure consequently, if the film be dusted over with any suitable powder in an extremely fine state of division, the latter will adhere to the unexposed portions, and be rejected by those that are rendered fully insoluble, and proportionately to the exposure in the half-tints, the result being a negative reproduction from a negative, and *vice versâ*.

Such being the outline of the process, it is evident that, for the purpose of remedying defective negatives, and especially for local treatment of weak skies or other portions, it is eminently suitable, as the negative itself may be made to do the work of picking out the detail, and as much or as little work as may be needed may be applied wherever it may be required. Thus, in treating a sky that is cut up by delicate foliage or other objects, there is no necessity for delicate hand work, as, by exposing through the deposit that already exists, the contrast is doubled or increased, and, if necessary, the process may be repeated.

In practice, for remedying defects in negatives, the sensitive material is preferably applied to the reverse side of the negative, and, after careful drying, the face or film side of the negative is exposed to light, when, after development, a duplicate negative image, wanting, of course, in sharpness, is formed upon the reverse side of the glass. The solution *can* be applied to the front of the negative, but the operation is, at best, a risky one, and, in case of failure, leaves no means of remedying or of repeating the process. Even the treatment of the back of the glass necessitates extreme care, in order to ensure that none of the material reaches the front or film side.

The first care should be to guard against the possibility of any injury to the negative itself, and the best means to adopt is to coat the film with transfer collodion. This is better than

any ordinary spirit varnish, though probably celluloid varnish would answer as well, as either of these will permit the treatment with a wet sponge, in order to remove any of the sensitive material that may flow on to the negative side in coating.

The front having been attended to, the next point is to thoroughly clean the back of the glass. This is necessary, not only for the purpose of removing any patches or smears of emulsion, which would interfere with uniformity of action, but also to secure an even coating of the sensitive medium, which exhibits a vast amount of perversity in running away from the edges of the glass and forming bare patches. The glass must, in fact, be as perfectly cleaned as if it were intended for use in the wet collodion process; that is to say, it must be not only mechanically but chemically clean, and even then the tendency will sometimes remain for the edges to reject the solution. A preliminary coating of collodion remedies this in the ordinary way of working, but this is scarcely possible on the back of a negative, owing to the necessity of washing to remove the ether and alcohol, the sensitive solution being applied to the wet collodion. A thin preliminary coating of sugar or glucose, rendered alkaline with ammonia and well rubbed in with the finger where it shows any tendency to run away, is a more feasible application, but it introduces other difficulties, chiefly in the way of getting an even layer of solution.

The best plan we know of ensuring the even flow is a rather curious one we saw used some years ago by a "handy man" at this and similar work, and of which he made no secret and did not seem to think there was anything special in it. After thoroughly cleaning the glass and finally polishing it, he laid down on the cleaned surface a sheet of paper coated with a mixture of gelatine and glycerine or molasses, similar in composition to printers' roller compound or the "graph" mixtures much used a few years ago. This, after remaining in contact with the glass a few moments, was stripped away again, and probably, by leaving an infinitely thin film of hygroscopic matter on the surface, caused the sensitive mixture to flow with perfect smoothness. We have recently revived this old dodge with the greatest success.

The chief difficulties end with the cleaning of the glass. The sensitive solution, formulæ for which will be found in the ALMANAC, should be freshly prepared and thoroughly well filtered. It is poured upon the back of the negative in the same manner as in coating a plate with collodion, taking care none reaches the front or film side; and it should be drained off closely, so as to leave as thin a film as possible. It is then dried at a clear fire, and, while still warm, the negative is placed, *film side down*, in an ordinary printing frame, backed with a piece of dark cloth or velvet, also dried and warm, and exposed to light. The exposure will vary from twenty to thirty seconds in good sunshine to four or five minutes in a bad light, being shorter as the negative is thinner.

The best powder for use in development is finely powdered electrotypers' plumbago. This, like everything else employed, should be carefully dried in the oven before use. Before proceeding to develop, the negative should be again warmed, to remove any moisture already absorbed, which would lead to unevenness of action at the outset. A small quantity of the black lead is then thrown on to the surface, and with a perfectly dry camel's-hair brush worked into those portions of the negative to be intensified. If only the sky is to be treated, the powder should be kept constantly in motion over the whole surface; if other portions of the negative require treatment, they are better left until the sky is done, care being taken not to touch them with the brush until the plate has been again warmed. This, indeed, is the chief precaution; never apply the brush to a portion of the plate that has been standing untouched for some time, or the moisture it has absorbed will take on a heavy blotch of powder. By proceeding slowly, occasionally warming the glass if the powder shows signs of adhering too freely, a deposit of the utmost fineness and considerable density will be obtained; but hurry will only lead to coarseness and failure.

When the desired result has been obtained, expose both sides of the negative freely to daylight for some time, and finally coat with collodion.

The Sayce Memorial.—We are pleased to observe that several photographic societies are taking an active part in assisting the memorial to the late Mr. B. J. Sayce which the Liverpool Amateur Photographic Association are promoting. We recommend the movement as one in which all photographers should take part; for there is not to-day a single camera-worker who is not in some way indebted to the work with collodion emulsion of the late Mr. Sayce, undertaken with the co-operation of Mr. W. B. Bolton. It will ever be a source of pride and gratification to those connected with this JOURNAL that in its pages publicity was first given to the process with which the names of those gentlemen are identified. The proprietors of the JOURNAL are happy to associate themselves with the memorial, to which we also invite the support of the photographic public, at home and abroad.

A Vibration-free Support.—For many scientific purposes, including a variety of photographic operations, a support free from vibrations is a necessity. At Leyden, Professor Einthoven mounted his delicate capillary electrometer on an iron plate floating in mercury, while Sir G. B. Airy, for supporting his artificial horizon, used a table slung from indiarubber bands attached to another table similarly supported, and this again to a third. In Wiedemann's *Annalen* still another and far simpler arrangement is described. A small circular table hangs from three vertical wires about six or eight feet long, the ends of which form an equilateral triangle. Projecting downwards from the centre of this table is a rod, which can be clamped in any position, so as to bring the centre of gravity of table and instrument into the plane of the latter. Any lateral displacement of the upper ends of the wire will start waves down the wires, which will arrive at the table simultaneously, but will only perceptibly affect it when the period of the disturbance coincides with the period of oscillation of the table about the point of suspension. Even then the axis of the table will be strictly vertical. The vibrations were, in a rough preliminary apparatus, reduced to a tenth of their original amplitude by the simple expedient of attaching little vanes dipping into oil or water to the table.

Celluloid Funnels.—A writer in the *American Monthly Microscopical Journal*, Dr. Arthur M. Edwards, in an article on *Filtering Water*, incidentally describes an ingenious application of sheet celluloid for making an extemporised funnel, and as there are few studios without a few sheets of waste film negatives a description of the plan will enable our readers readily to make one of these useful parts of the laboratory complement. Such a piece of celluloid, free of course, from any gelatine film, is taken, bent round in the shape of a funnel, and placed in an ordinary retort or funnel stand. Into this the filter paper can be placed. As the celluloid is thin it will be easy to punch holes in it all over which will very materially increase the rapidity of filtration. If a punch be made with a series of apertures in this manner the actual apex of the cone may be closed, and so form an excellent support for the weak part of the filter. When the funnel is no longer needed, it can be taken out of the ring, cleaned and laid aside, flat, for future use. If

it be desired to construct one of a more permanent nature, the correct shape will be found by cutting an exact half-circle of the material, and, bending it at the centre of the diameter, bringing the two radii together, and joining them in any suitable manner. If it be wished to overlap the edges to form a good joint, it will be better to make the piece of celluloid a little beyond the true half-circle, cutting from the centre, so as to give, instead of a diameter, an obtuse angle. If this be not done, the filter paper folded in the usual manner will not fit the funnel properly.

Action of Light on Cellulose and Iodides.—A very suggestive paper bearing on this subject was read at the British Association meeting by Mr. Douglas J. P. Berridge, M.A. In his early experiments he saturated a sheet of paper with the desired soluble iodide exposed to sunlight in a printing frame under a negative. Concentrating his attention on cellulose and iodide, he at first found considerable difficulty in obtaining a suitable sample, owing to the constant presence of thiosulphate in the cotton-wool he tried, but finally he used filter paper (of a sort now easily purchasable), which had been treated by hydrochloric and hydrofluoric acids. The action of sunlight then on the mixture of cellulose and iodide of potassium was very marked. The theory of action he propounds is, that when the light acts on the iodide it causes the oxygen of the air (the presence of which is necessary to success) to liberate iodine; the free potassium hydrate formed does not recombine wholly with the iodine owing to the cellulose absorbing it. In order to obtain prints on paper, he used a frame exactly like the ordinary photographic printing frame. The paper must not be too absorbent, and one with a smooth surface answers best. Although he had been able to take fine proofs from ordinary negatives, the detail was too rough for these to be satisfactory, and consequently he generally employed a negative made by cutting out a device in paper, fastening this to a sheet of glass, and varnishing. The best strength of solution for sensitising was about one to eight of water. If the paper is exposed wet to diffused daylight, the action is quick, five minutes sufficing to give a light chocolate-pink print. If the paper be dried it assumes a uniform faint chocolate tint, but is capable of giving a print in dark chocolate in four hours. To fix these images the print, first wash for a short time in running water, and lead acetate in dilute solution is then poured over the print which is finally to be again washed. To preserve the print, it requires to be protected by a coat of size followed by a hard varnish. Mr. Berridge had a print three years old which still showed the image. Barium, strontium, and calcium iodides were tried, and, of the three, the calcium salt was the most sensitive.

JOTTINGS.

Just to show, I suppose, that there was no ill feeling, the members of the Linked Ring favoured me with an invitation to their smoking *conversazione*, which was held on the evening of Tuesday, the 15th inst., at the Dudley Gallery. Fortunately the weather was unpleasant, so that, probably, a good number of people who had been invited stayed away. The charming little room, therefore, was not crowded, and music, refreshments, and conversation could be enjoyed in comfort. It was a pleasant function all through, being stamped as usual by the taste and distinction which Mr. Maskell is noted for imparting to everything he undertakes. Some of the members of the Linked Ring harbour ideas as to what constitutes art in photography with which I find it impossible to sympathise; but they dispense hospitality to their friends and foes in a manner that defies reproach.

Which reminds me that, in the advertisements of the Salon that are printed in the daily newspapers, the public are told that the Exhibition is one of the "new photography." New since October, 1893, I wonder? If so, I should like to know what there is particularly "new" about the photographs of Mr. H. P. Robinson, Mr. Davison, Mr. Horsley Hinton, Col. Gale, Mr. Cameron, Mr. Hollyer, Mr. Crooke, and Mr. Ralph Robinson, who, with one exception—Mr. Craig Annan, to wit—probably constitute the greatest strength of the Exhibition? The influence of the Salon, while it has been in existence, has mainly tended in a good direction; but in the interests of historical accuracy and justice, as well as to save the gentlemen named from the silly flatteries of their too-gushing and injudicious friends, I beg them not to be persuaded that photographic "art," even as it is preached and practised in Piccadilly, is quite so "new" as only a third season.

Still, that "new" photography worries and irritates me. What is it? The advertisement from which I have quoted, and which, in a way is an epigrammatic paraphrase of the highly contentious and imprudent "Forewords" to the Salon Catalogue, bids us look for something "distinct from ordinary photography." Such things, however, are not quite so easy to find this year as in 1894 and 1893. The results now to be seen at the Dudley Gallery which might be considered "distinct from ordinary photography" probably number half a dozen, of which "No. 206, *Just One More*, by Mr. John Gambril Nicholson," stands out by reason of its conspicuous non-resemblance to a photograph, whether ordinary or extraordinary. To a man, the critics have unsparingly ridiculed this villainous blur of a cricketer taking a nocturnal shot, and Mr. Gambril Nicholson retorts by inviting them to stand on their heads and look at it that way. I don't suppose any of them will do it, simply out of regard for Mr. Nicholson's quickly won reputation as a photographic joker, of which I am sure not one of them would do anything to deprive him. So take my advice, Mr. Nicholson, and rest and be thankful.

As to the "propriety" of sending in duplicate prints to the Salon and Royal Photographic Society's Exhibitions (held concurrently), upon which "Druid," in the Journal of October 11, invites my views, very few words of mine are needed by way of reply. I see no harm or impropriety in either a member of the Society or a Linked Ringer sending in duplicate prints to both Exhibitions—quite the reverse, in fact. My reason for this opinion is a simple one. Observation has shown me that the Salon and the Society has each a public of its own—the *majority* of the visitors to the one Exhibition do not go to the other, and *vice versâ*. Now, I take it that when a man publicly exhibits his photographic work, he does so in the "missionary" spirit; consequently, the larger his public, the better his chances of improving public photographic taste and spreading a love for photographic art. Wherefore, I ask in return, why should not a man exhibit at both places? I fear these views will be popular with neither loyal Salonists nor Royalists, because they are of a non-partisan character; but there are some subjects upon which even I am totally without bias or preference, and this is one of them.

We have all been waiting for the pronouncement of the death sentence on the ill-fated Benevolent Association, and it has been delivered at last. Anything I might say now could only be in the nature of repetition, and I therefore hold my hand. Photographic assistants and the photographic profession have shown over and over again, in the most conclusive manner, that they will have nothing to do with a Benevolent Association, and there's an end of the matter. Mr. L. C. Brooks and Mr. R. Y. Murphy, who, from the report, appear to be desirous of attempting to raise the dead Association to life, are to be complimented on their pluck and to be pitied, in advance, on their failure.

Mr. W. F. Slater, of Southampton-street, Camberwell, S.E., sends me a neatly mounted portrait of an individual, to whom I am alleged to have some sort of relationship, that recently appeared in a contemporary. With the portrait Mr. Slater, who is a picture-frame maker, forwards samples of picture-frame mouldings, with the prices attached. The mouldings are tasteful and refined; the prices of them are moderate. I suppose Mr. Slater makes a practice of this ingenious system of bringing his productions under the notice of likely patrons; if so, he is to be commended. I always earmark a good idea for mention in this column, and, as I have stolen and published Mr. Slater's dodge for the general benefit, it is only righ

that he should have a little "back money" in the shape of the good words I here give his frames, which, from practical acquaintance with them, I have found effective and cheap.

An unknown correspondent, who is possibly possessed of the ambition to make me more miserable and gloomy than I naturally am, forwards me the October letter, addressed to members and friends, of the Committee of the Anti-tobacco Society and Anti-narcotic League. This document consists of four pages of dreary denunciations of public smoking, slightly relieved and brightened by a funny deliverance of Sir G. Williams, who is credited with the statement that, if he were a lady, he would enter into a league and covenant to have nothing to do with a young man who kept a chimney in his mouth. Ah, but they're not built that way, Sir George. However, the object of this is to express my regret that I am unable to extend my support to the Anti-tobacco League. I said that my correspondent was unknown to me. In all probability I am unknown to him, otherwise he would scarcely expect *me*, of all persons, to admire either his League or its great and glorious patron, King James I.

I am told that the London and Provincial Photographic Association, at its last meeting, resolved to contribute 2*l.* 2*s.* to the Sayce Fund. I applaud the action of the live and vigorous "L. and P.," which can always be safely trusted to do the right thing at the right moment. I hope that the other London societies will follow suit, and that a handsome sum will be collected for the memorial to one who was as generous as he was gifted, and to whom photography, directly and indirectly, owes a great deal.

Very sorry I am to find that Mr. C. Arthur Pearson, who I have always regarded as a keen, businesslike journalist, animated by justice and kindness, has been led to employ the enormous area of publicity he commands as a means of harassing and embarrassing a profession lately so much given over to be the sport and captive of all sorts of knaves and rascals. I have not seen the pictures he offers in exchange for five shillings and four coupons, but I take it they are 15 × 12 bromide enlargements worked up by the air brush. To state that such productions as these, with the quality of which every one of my readers must be familiar, would cost, through an artist (*sic*), "from three to five guineas," is, to put it mildly, an exaggeration. The harm this unfair plan of promoting the circulation of a paper will do innumerable small photographers supplying bromide or other enlargements is bound to be great; and I therefore hope it is not too late for Mr. Pearson to substitute some other plan, of a different character, for the one he has so unfortunately chosen.

I'm afraid I weary my readers, as I occasionally do myself, in cutting and slashing so persistently at the various free-portrait swindles and other schemes for gulling the non-photographic public and damaging a sorely handicapped profession; but the knowledge that I am occasionally useful in checking them, even in a small way, urges me to labour the subject. I take pleasure and delight in helping to fight the battle of the little man against his rich or powerful oppressor. It is to be regretted that the big guns of the photographic profession are not more to the front in helping their weaker brethren. The modern poet says that—

> "Hearts just as bright and fair
> May beat in Belgrave-square,
> As in the lowly air
> Of Seven-dials."

What we should all like to see would be the union of hearts (and interests) between the photographic Belgrave-square and the photographic Seven-dials. Then the Royal Photographic Society, the Convention, and the N.A.P.P. would be in danger of being overcrowded, and the Benevolent would live, a prosperous institution.

COSMOS.

CONTROLLING OVER-EXPOSURE AND OBTAINING DENSITY IN DEVELOPMENT.

[North Middlesex Photographic Society.]

SOME twelve years ago Mr. W. B. Bolton published in THE BRITISH JOURNAL OF PHOTOGRAPHY,* of which at that time he was editor, a couple of articles on *The Reproduction of Negatives by means of Gelatine Plates*. I remember his showing to me, at the office in York-street, a set of transparencies and negatives, each pair reproduced from the preceding pair of reproductions, a method of proceeding calculated to emphasise any defect in a process. The results were to me surprisingly good, but the principles of the method used have a more extended application than might be inferred from the title of the articles referrred to.

The essential character of the method employed may be summarily stated in Mr. Bolton's words, "Full exposure with a rapid development, suddenly checked at a certain point, from which intensification is proceeded with slowly." It afterwards occurred to me that if "full exposure," which it was said might include considerable over-exposure, had no ill effect in making reproduced negatives when controlled by the means indicated, there was no reason why over-exposure in general should not be overcome by the same means; and there is this great advantage about it, that the development may be commenced with a solution made up for ordinary exposure, so that a plate only suspected of being over-exposed will not be injured by being treated with a developer unsuited for correct exposure.

The plan I use is as follows: The plate is developed, as is my general practice with exposures on rapid plates believed to be correct, by immersion in a solution containing two grains each of pyro and bromide to the ounce. Three to five minims of liquor ammoniæ ·880 (or ten minims of proportionate dilution) are poured into the developing cup, and, after the pyro and bromide have soaked into the film for, say, half a minute, the solution is poured off the plate into the cup, when the ammonia becomes thoroughly mixed in, and the whole is immediately poured back on to the plate. If the image comes up so rapidly as to indicate over-exposure, the developer is poured off into the cup, and a solution of bromide of ten per cent. is instantly flooded on to the plate. This bromide solution is allowed to act for about half a minute, when it is poured off again and the developer returned from the cup to the plate. To quote Mr. Bolton again, the solution now "appears to possess a truly selective power, acting chiefly on the deposit already formed and possessing little, if any, real developing action."

The plate now takes on intensity. The action is slow, perhaps ten minutes may be required on an average; but this is a trifling inconvenience compared with the advantage secured. I have a swing shelf in my dark room, and, after covering the developing dish with another of larger size used upside down as a cap, I do not hesitate to open the dark room door and go in and out, though I should not venture to uncover the window light.

The controlling bromide solution may be used over and over again. I always have a wide-mouthed bottle of distinctive shape standing handy in the dark room, ready for immediate application if the plate should require it. By repeated use and the addition of what water comes with the developer from the plates treated with it, the bromide will diminish in strength to perhaps one-half of its original percentage, but there seems to be great latitude in the strength that may be used, so that it still works well up to the dilution stated.

I may add that, in looking up these articles of Mr. Bolton's, I have been unable to find mention of the immersion in a separate solution of bromide such as I have described, and such as I thought I had read of in his writings. Perhaps it was given in some later article, but the principle is the same. Mr. Bolton's sudden checking of the developing action given in the articles quoted was effected by means of the addition of bromide to the developer itself.

I have spoken of "controlling" rather than "correcting" over-exposure, because the latter expression might be taken to imply that an over-exposed plate would, when treated as directed, give results identical with those obtained by what would be generally called "correct" exposure—the exposure, that is, that with ordinary development will give the most satisfactory picture, on the whole, as to tensity and gradation. The results are not quite identical; but, in many cases, those obtained with what is called over-exposure, treated as directed, are, in my opinion, superior to those obtained by the shorter and generally recognised as "correct" exposure. This idea occurred to me very forcibly when, some years since, Mr. Warnerke showed some Russian photographs of interiors which had been, as stated, much over-exposed and greatly restrained in develop-

* THE BRITISH JOURNAL OF PHOTOGRAPHY, vol. xxx. page 768, and vol. xxxi. page 1.

ment. On that I raised the question, which I do not think has been answered, as to what ought to be considered "correct" exposure. The particular in which "over-exposed" negatives treated as described appear to me to have the advantage is in the fulness of gradation in the darker half-tones. As a result of this gradation the shadows represent nature more nearly as we see it, instead of being large blank spaces as photography is too apt to give us. In flesh shadows particularly, it is very unreal for them to be nearly as black as those of dark drapery. I have here a negative which, having been exposed too late in the afternoon for exact calculation as to the required time, received what proved on development to be much in excess of what was really necessary. The image flashed up in the developer; but, being promptly checked by the bromide solution and afterwards returned to the developer to gain density, it gives the effect of luminosity to the flesh shadows such as it is not easy to obtain in any ordinary way. Of course, I do not say that all subjects should be treated in the same way, but wherever we may see an advantage we do well to recognise it.

The proportions given for mixing the developer are those which happen to suit the plates I generally use. With some plates one grain of each of pyro and bromide to the ounce, and somewhat less ammonia than that given, would form a better developer for general use; but, in any case, start with the developer suited to the plate when it has received normal exposure.

If great over-exposure is suspected, it may be well to dilute the developer as a whole, so that its action may be more closely watched and the controlling bromide applied in time. In this case, however, the developer should be strengthened, or a fresh full-strength developer prepared for use after the bromide. The addition of a little more pyro to the ordinary developer will assist in gaining density more rapidly, but I scarcely ever use it.

The second half of the title of this paper, "obtaining density in development," does not require much to be said. The method described for controlling over-exposure gives a very great amount of density if the action is continued sufficiently.

From a weak negative made by an amateur I made two exposures on one plate and developed them as described; the one which had received the longer time came so dense that I could not have used it; the other was right, and from it a very good enlarged negative was secured W. E. Debenham.

ENLARGEMENT.

[Plymouth Photographic Society.]

The subject of my lecture to-night has been announced as dealing with enlargement. Since that announcement was made, however, I have enlarged the subject, and propose to incorporate with it a closely allied one.

You will, of course, understand that in speaking of enlargement, we take the conventional meaning attached, and refer simply to enlargement by projection of light through a small negative on to a sensitive bromide paper, which we subsequently develop by suitable chemicals. Now, all this presupposes the possession of the small negative which, as you will hear, should possess certain qualities, and it is in connexion with the production of a suitable small negative that the enlarged part of my subject deals.

First, then, as to enlargement proper.

I think you will all admit it is a most fascinating pursuit, and has so much to recommend it that, to save time and words, I have put the advantages in a tabular form.

1. A small kit only is necessary in the field; hence ease of carrying and capacity to take more plates.

2. Diminished expense both of apparatus and material; hence one can often afford good lenses where the price of larger sets would be prohibitive.

3. Only those negatives need be enlarged which are worthy of it.

4. With a reasonable degree of enlargement beauties appear which were practically indistinguishable in the small picture, and it is generally admitted that it is more pleasant to look at a large picture than at one so small as, even when technically good, to appear insignificant.

5. The winter evenings can be employed in enlarging the summer's work, provided artificial light is used, and, as you know, little or nothing else except this or lantern-slide work can be done at this time.

6. Bromide enlargements are, in my experience, comparatively permanent.

7. As compared to lantern slides, I think it more pleasant to look at enlargements than at a lantern show, and, as you will note they are available at all times.

There is an old adage which says, "First catch your hare, then cook it." Hence we must first get our small negative before we enlarge from it, and we will now consider the qualities we require in a negative which render it suitable to enlarge from. I allude in no way to the artistic; that must be a matter of individual judgment. My remarks refer solely to the technical.

In the first place, the negative should be somewhat thin and very clean all over. You will often see negatives with yellow or brown stains on them, or one end will be a different colour from the other. I need hardly say you will never succeed in getting good results from such; as in enlarging, all such differences, often scarcely visible to the eye, become greatly accentuated. Secondly, your small negative should not contain any large masses of light or shade, but should be full of fine detail.

Now, any one who has had much experience at negative-making will recognise that these qualities are most easily attained by giving a full exposure, not, mind you, necessarily over-exposure, but rather to err on that side than the other.

A third, and very essential quality, which a negative to be enlarged from should possess, is good definition throughout; for, as you will readily understand, all defects are magnified, hence want of sharpness at the margins which, in the small direct print, would be hardly noticeable, become in the enlargement painfully apparent, and produce a fuzziness which is anything but beautiful, but which, on the other hand, has a distinctly unpleasant effect on the eyes; and this brings me naturally to the second part of my subject, viz., the lens with which our original negative shall be taken.

Now, I will at once say I do not intend to inflict upon you a review of all the lenses available, or the best manner of using them, but will at once call your attention to a lens recently put upon the market by Messrs. Taylor, Taylor, & Hobson, of Leicester and London, and by whose courtesy I am enabled this evening to show you one of the said lenses, and, having had it some days, I am enabled to report as to some of its capabilities.

You will see by reading the booklet, of which a number have been distributed, that they have called it the Cooke lens, and they claim for it freedom from astigmatism and from curvature of the field, two very important considerations in the production of small negatives to be subsequently enlarged from, if allied with other good qualities. I need hardly tell you, gentlemen, that I have no manner of interest in this lens beyond ascertaining its capabilities, and I have therefore tested it in other ways than that given in the booklets you have in your hands.

You will note that it has been tested for flatness of field against lenses of well-known and reputable make at *f*-8, and against them at that aperture it comes out first. We are not, however, at all times, or as a rule, obliged to use our lenses at *f*-8, and by diminishing the focal aperture it is well known we get greater flatness of field. You will also note that it has been tested for astigmatism by photographing from a flat surface. Since, however, we do not usually take our photographs from flat surfaces, it becomes necessary to ask how is it for depth of focus, that is, how will it translate the images of objects which lie in different horizontal planes on to one plane, viz., that of our focussing screen or plate, and further than that, before we can fully realise its capabilities, we must ask this question as regards objects which lie comparatively near at hand.

I will at this juncture point out that, should the answer to all these questions be satisfactory, the lens at once steps into front rank as a hand-camera lens, and, as negatives from hand cameras are necessarily largely used for enlarging from, you will see the study of this new lens is clearly a branch of my main subject to-night.

The lens before you is one of 6·25 inches, equivalent focus, and purports to cover 5×4, to work at *f*-6·5, and is fitted with iris diaphragm. As a matter of fact, it covers much more, for, the fronts of my 5×4 and whole-plate cameras being interchangeable, I have tried it in the latter, and there appears no falling off in definition, certainly inside of half-plate. It is, however, desirable to have for rapid-shutter work a lens of much greater covering power than at first sight appears necessary, for you will find, if you experiment, that the covering power of a lens falls off from the centre much more pointedly and rapidly when used with a quick shutter than when used for longer-time exposures. I mean this, if you accurately focus a given view, use, say *f*-11, give a quick-shutter exposure, and, without altering anything, put in a second plate, and take the cap off and on, you will find, unless there is a very large margin of covering power in the lens, that the second plate will show much better definition all over than the first, where the accurate definition will be confined to the centre.

Now, it is a well-established fact that negatives intended for subsequent enlargement, either as lantern slides or, for bromide work, yield better results when taken on slow plates than on rapid ones, on account of the greater fineness of grain of the former, the more rapid the plate the coarser the grain, and this to such an extent that a very moderate degree of enlargement shows this. Hence results can be secured with a lens working with a great intensity on slower plates than is possible with a lens of less intensity; in other words, while the large available degree of light passed by the one lens is sufficient with the slow plate to secure well-exposed results, a slower lens under same conditions would give an under-exposed and inferior result, or, using the lens of large working aperture and quick plates, you can obtain results at times and under conditions which without it would be hopeless to attempt, and here again, if possessed of other good qualities besides its freedom from astigmatism, the splendid covering power of the Cooke lens at full aperture of *f*-6·5 gives one an additional power.

The two 5×4 negatives to which I now draw your attention, you will note, are both of the same subject, and are taken to test the lens for astigmatism. These concentric circles, taken from the booklets issued by Taylor & Hobson, are so arranged as to form the diagonals of the plate; and you will notice that, while the centre figure on plate 2 is quite perfect, there is a distinct falling off on the other three, whereas on the plate labelled 1 all are equally perfect. Now, this test has been a very severe one; for, while No. 1 was taken with the Cooke lens at *f*-8, No. 2 was taken with a six-inch wide-angle lens of Continental make of high repute, and which is marked to cover from 7½×5 to 9×7, according to stop used, the stop in this case being *f*-12, the largest the lens has. Now, when I show you the whole-plate interior taken with this lens at *f*-22, you will admit it is a very first-class lens when stopped down and used for interior work, but that as a copying lens it is unmistakably behind the Cooke.

It is, however, only right I should show you a view taken with the same two lenses, the one at its full aperture of *f*-12, the other at *f*-8; and in this case you will note that in the former objects lying quite close to hand are in better focus, while the medium and extreme distance are sharp in each.

You will, however, hardly need that I should point out that in this comparison the Cooke lens is somewhat handicapped, as it is *f*-12 against *f*-8; then, it is the centre of a 7½×5 lens at full aperture against a 5×4; and, further, wide-angle lenses have greater depth of focus than narrower-angle lenses of the same covering power.

You must not, however, overlook the fact that the comparison is exactly the same as was made in testing for astigmatism, and that here the results are reversed, which shows that no one lens will at the same time have every good and desirable quality in the highest degree.

You will, however, be far more interested in seeing its performance as a hand-camera lens, and I therefore submit to your notice a few 5×4 negatives taken with it, the shutter speed being one-sixtieth of a second, or very near that. The two shipping subjects were taken with the full aperture. the others at *f*-8. I may at once say I was agreeably surprised at the depth of focus, which, at the large working aperture, is, as you will see, much greater than could reasonably be expected while, beyond a moderate distance, everything is microscopically sharp; and, as to covering power, I think you will admit there is practically no falling off anywhere. You will also note, by comparing negatives seven and eight, that the performance of the same six-inch whole-plate lens, when used in the hand camera, is far behind the Cooke as to general covering power. The lens at full aperture has naturally a very short range of focus, that is, objects are in or out of focus with a very slight movement of the screw or rack; but, when stopped down, it has quite a good range. At the same time, for hand-camera work, accurate adjustment of the screen is necessary, and that and the sensitive surface which takes its place must be in absolute register.

I would finally call your attention to the old houses in Pins-lane, as the result fairly shows the capabilities of the lens under very trying circumstances. The place, as many of you know, is very narrow, and you are therefore quite up against your subject. I racked out the lens at guesswork, and hit off exactly, still using the shutter at same speed, but would have been wiser to have reduced it to one-half. The result, however, I think you will admit, does great credit to the lens, and also that, considering the weather we have had, it has been tried under adverse circumstances, and has come well out of it.

As many of you are aware, I am far from being an advocate of the hand camera; but, if anything would convert me, it would be the fact that so desirable a lens is now available to render it possible to do really good work with that much-abused instrument. I mean much abused in the way in which it is so often used for subjects utterly unsuitable for it. It is very much as though a carpenter used a gouge, and a gouge only, for every class of work he had to handle.

We will now, by means of Hume's cantilever enlarging apparatus have a practical demonstration of the process of enlarging on bromide paper by projection, and, in passing, I would say that for suitable negatives, that is, negatives not too dense, the slower varieties of bromide paper are more easily handled than the very rapid; also as to developers, while I have tried probably every one fairly usable, such as eikonogen, amidol, metol, hydroquinone, rodinal, &c., and have at times obtained good results, my own experience is that there is no developer so reliable as the iron developer. After that comes, in my opinion, metol or combinations of metol and hydroquinone.

I trust, gentlemen, I have not wearied you with the length of this paper; further than that, I must apologise for, to some considerable extent, departing from the original title and subject of my lecture, but trust you will consider that I was warranted in so doing.

E. H. Micklewood.

SOME IDLE THOUGHTS ON PHOTOGRAPHIC SOCIETIES.

[Photographic Club.]

Like many words in our circumlocutory English language, "idle" in conjunction with certain other words or used in a certain form, conveys another idea than that of laziness or indolence. The exact meaning is difficult to express, as it is just one of those indefinable metaphors that we know all about but yet cannot absolutely and exactly resolve; and another point is that the idle thought does not carry with it the idle fellow, for, if that were so, it would convey an utterly erroneous idea as regards myself. So, to make a clear start, let me say that "idle" is used in the sense of random, disconnected, odd, and perhaps curious as well.

Now, the first problem to be faced is, what is a Society for, what is it supposed to accomplish? Or to put it in a businesslike way, why do we pay our subscriptions—because some of us do—to a man called the Hon. Secretary? I presume most of us expect to get our money's worth. Now do we? The inevitable individuality of such a question precludes dogmatism, and it can only be considered in it's several aspects. To do this elaborately is not necessary, and certainly would be no "idle" task, but a few thoughts I have jotted down in nature's note book, may clear the atmosphere a little.

Idle thoughts have a quaint nomadic attribute, and so I find myself drifting into a study of the individual in order to define the intercommunity, and, upon the principle of "tell me the company you keep and I'll tell you what you are," we may get an idea of the Society through its members. In so doing, by the bye, we run against a curious fact, that the same kind of men are to be found in most societies.

Jotting them down roughly, they classify into the following species:—

The Novice.
The Know-it-all.
The Man with a Grievance.
The Orator.
The Old-style Professional.
The Process-monger.
The Artist.
The Specialist.
The Quibbler.
The Please-all.
The Wit and the Frivoller.

The genus "novice," the over-enthused beginner, burning with a zealot's fire of knowledge upon all matters photographic, is a decided feature of society life. He utilises usually the question box, and is at his best perhaps upon some query as to the cause of spots on his negative, or the reason of certain markings. The remainder of the brotherhood in solemn conclave suggest this, and think that, but the genus "novice" is quite sure that all these ideas give no clue. "Dust on the plates?" Why, he can bring witnesses to prove how often he used the brush. "Developer carelessly mixed?" Then how was it another plate that passed through the same developer was free? No, it's bad plates, that's what it is. Then, after the business is over, he hawks that confounded negative round, and just satisfies himself, at the conclusion of the evening, that either the others know little more than himself, or it's a case of bad plates, which the others are afraid to deal with in view of a libel or slander case following. Of such genus is the "novice," the enthusiast, we cannot do without him, but a little of him goes a long way.

The genus "know-it-all" is closely assimilated to the "old style professional," in fact they are relatives. What *they* don't know isn't worth knowing, but how much they really do know the gods only know. The "know-it-all" is not a safe species to tackle, but he may be readily floored by the "specialist" and it's safer to leave it to the latter. In every discussion the "know-it-all" partakes, and he usually imparts considerable sarcasm flavoured with egotism. The formula may be expressed as "equal parts, but a little more of No. 2 if the opponent is under-exposed." His opinions upon all matters are of the order emphatic and unanswerable. He knows, you don't. *Verb. sap.* Curtain. We can settle him off with an Irish proverb, "I'd make money if I could buy him at *my* price and sell him at his own."

But it is an idle thought, for he is extra superfine ingrained inlaid and ultra rapid, far above the usual scale of chargers, though his own rate for self-advertisement is low.

It is a very short step from the humorous to the pathetic, and in the "man with a grievance" we make the step. He is the victim of a chairman's high-handed tyranny, or of a secretary's overweening superciliousness. Perchance some ignoble, boorish clique has for the present triumphed in a battle for the glorious right. (In this case the definition of right is supplied by the loser). Nor heaven, nor earth, nor—any other place—can deter him from seeking his unalienable right. Special council at committee meetings, extraordinary general meetings, letters to the press, and perhaps finally an advertisement offering to send a printed pamphlet free of charge to expose and lay bare the iniquitous deed of brutal infamy, all follow in turn. There is a grievance astir in the Society, there is one man o'erflowing with it, and he'll continue to flow until it is put right, until Heaven receives her due, and—well until he gets his own way. Until then there is no sun for him, the moon doth but hide her light in sympathy, and the stars twinkle with indignation at the injustice. A wild fresh breeze from Father Thames is needed to drive away the fog of crass ignorance, and the man will have it even if he has first to filter the breeze through blotting-paper. The earth may cease its assiduous ambulation, the sun go out, the moon may effervesce and the stars form a saturated solution of night-late of silver, but the "man with a grievance" remains. Now, instead of saying "he" remains, we should like to alter the pronoun and make it "his" remains. We would not mind an increased subscription for a few years to cover the expense of cremation. Idle thought, no such luck.

Lives there a man with soul so dead
Who never to his friends has said,
I am an orator.

Your technique, art, I can despise
In wealth of language *my* strength lies,
In oratory.

I twist your arguments about;
Adverb and adjective I throw out,
And beat you.

You say the camera cannot lie.
Admit it if you will, but I
Can, in oratory.

Now we are introduced to the higher flights of imagery, of soulful conceptions of noble things, and enters the "orator," the speaker. He may know nothing of the subject, nor possess the slightest interest in it, but it's a chance to speak, and such chances are never missed by him. "Mr. Chairman and dear friends, this is not a subject to be discussed lightly. The past has brought us face to face with many momentous questions, and we have dealt with them as became the gravity of the situation. There are tides that must be taken at the flood, and there is a time in the affairs of every Society that brings in its train;" and so on just as long as he can fling bald platitudes, rusty old quotations, and threadbare conjunctions of phrase and word at our heads. And yet the orator is not a bad sort; a little pompous perhaps, but very harmless. An idle reminiscence will come in handy at this point. It was an orator at work on the blackboard describing the rules of composition. He pointed out the foreground and the horizon, and then very foolishly mentioned the middle distance as a question. "And where, gentlemen, is the middle distance?" said he, and for a second looked me full in the face. With becoming modesty I suggested that "perhaps it had gone round the corner for a drink." The suggestion of drink bottled him up, and we got through the paper with more blackboard and less oratory.

Enter the "old-style professional." You cannot tell him much. He belongs to the Society more to render than to receive help. Tell *him* anything? Why, bless your soul, he took negatives 20×18 before you were born, sir. Yes, and they were negatives, too, that a man had to work for, sir. My thoughts always connect the old professional with the wet plate; your new-fangled mediums he uses for convenience sake, but his heart is true to the dear dead days beyond recall, the days of the beloved silver bath and dirty fingers. There was much to admire in the old school, they have battled through difficulties that we know nothing of now, they are earnest, and have experience behind to back up convictions and opinions. The experience, however, tends towards dogmatic utterance, and there is a repugnance towards the new and novel in whatever direction it appears. It is a purely natural characteristic, this opposition to the new, the outcome of years of practice with the old, and the longer one continues to use one process or one apparatus the more difficult it is to make a change. The "old-style pro." falls in line naturally with the pyro-ammonia brigade, and the sharp, clear, brilliant regiment. Still he is all through a useful member, and the free way he advises and counsels is beyond praise.

The formula for the process-monger is formula. He breathes, he revels in it, and without fresh chemical combinations the world would be dreary and humdrum. No paper read and no discussion pleases him unless some formula is mentioned, then he is interested. "What?" he says; "3 grains pyro, 4 grains sulphite soda, 2 grains bromide potassium, 2 ounces water! Snakes alive, I must try this! Why, my last formula gives only $3\frac{15}{17}$ grains sulphite soda!" And for a time he is happy. But at the next meeting it is some art rot, according to his way of putting it, without a single formula in it, and then he wants to know what the Society is coming to, and suggests a change of President and Secretary, or hies off to kindred spirits to form another Society. WALTER D. WELFORD.

(*To be continued.*)

THE HELIOGABLOTYPE.

[American Journal of Photography.

THE Turkeytown Hypo Club has once more covered itself with glory. A special meeting was called early last month to receive a communication from Mr. Heliogabalus Wyk, a member whose voice thus far has not been heard in the learned deliberations of the Society. Heliogabalus was one of those inoffensive persons to be found in every amateur photographic society, who attends the meetings, but never have anything to say, and whose photographic sun rises and sets in the few magnates who rule the society.

Great, indeed, was the surprise of Prof. Gobler and Dr. Oxalate, when a request was received by the board of censors of the Turkeytown Hypo Club, from Heliogabalus Wyk, to make a communication to the Club. But greater still was the astonishment when this former unnoticed member intimated that he would show that all orthochromatic plates, eoside emulsions, colour screens, light filters and the like, were only useless photographic catch-pennies, invented to fill the pockets of the plate-makers. Further, that he had now discovered the true solution of the problem for producing photographs in the colours of nature, all of which he offered to disclose to the Turkeytown Hypo Club in a paper to be read before them at such time as should be decided on.

After some discussion, in which Prof. Gobler took the ground that whenever a member makes a discovery he should communicate the process to the board of censors, and then let him (Professor Gobler) bring the matter out before the world. As this would be much more the dignified course. It was decided to call a special meeting to which every member should be invited. A few words of explanation as to who Mr. Heliogabalus Wyk was, will here prove of interest.

Heliogobalus, or "Gab," as he was called for short by his friends and fellow clerks, was a book-keeper employed in one of the large shops of Turkeytown, and while he bent over his ledger his thoughts would often wander to his pet hobby, amateur photography. So he brooded over the colour problem. He had listened to the wise discourses at the club between Prof. Gobler and Dr. Oxalate, in which the spectroscope, wavelengths, colour sensations, sensitive dyes, yellows, blues, and reds, with unpronounceable names and Greek letters formed the chief subjects. He also read in the daily papers, notably such as are published on Sundays, about the wonderful discoveries and processes of Lippmann and his award of 12,000 francs ($2400) by the Academy of Sciences, then he read accounts of Vogel, Du Hauron, Joly, and others, all of which set Heliogabalus thinking, until at last he evolved what he considered the true solution of the colour problem.

Upon the eventful night Heliogabalus appeared promptly, and at the proper time stated that he "had solved the great photographic colour problem," and that the only surprise was its simplicity.

After duly considering the accounts of the numerous discoverers of the colour photography as published in the various Sunday papers, he had come to the conclusion that they were all wrong. The very theory of stained or eosided plates was a fallacy, and so far as screens of coloured glass was concerned, or tanks filled with coloured liquids through which

exposures were made, he agreed with the noted English expert who recently stated that all that colour screens were good for was to prolong the exposure.

Now his discovery permitted the shortest kind of exposure upon ordinary plates, giving true colour values in the case of the negative, and in the positives, when the process was perfected, would surely reproduce the colours of nature in all their pristine glory as seen upon the ground glass in the camera.

For this new method no expensive apparatus or spectroscope was necessa ry, as all the so-called spectrum analysis was a useless humbug. The ordinary amateur outfit, no matter how cheap, would answer, the only additional requisite being a few cents' worth of chemicals.

The whole meeting was now on the alert, the members leaning forward in rapt expectancy to catch the particulars of Heliogabalus's great discovery, the only exception being Prof. Gobler, whose countenance showed plainly signs of envy, and Mr. Schnitzelhuber, who had fallen asleep.

Heliogabalus continued: "In the first place, to obtain true colour values, I make my exposure as usual on ordinary plates, then I mix my developer according to the subject. For instance, if blue predominates in the original, I mix my amidol developer without alkali, and add sufficient helianthine to make the developer as yellow as the subject is blue. If yellow predominates in the orginal I reverse the process as to the colour of the dye used. Where reds and greens predominate I proceed in the same manner, using methyline blue, fuchsine or similar dyes but always complimentary to the subject photographed."

"You will see," continued Heliogabalus, "that I merely add the orthochromatising liquid to the developer in place of staining the plate, or making colour screens, as both of these processes are useless. Only in its plastic state during development can the dyes act upon the argentic bromide to be reduced in such a manner as to give the true proportional colour values.

"In general photography it is but necessary to mix up three developers, each one third normal strength with the addition of the proper pigments, and which, when combined, make a developer that will give true values of all colours."

To obtain positive prints in the colours of nature it was merely necessary to print bromide paper under an ordinary negative, developed with the triple sensitised developer, and then develop the positive with a similar triple developer sensitised with dyes complimentary to those with which the plate was developed. This was strictly in accordance with the principles laid down by Collen respecting the three primary sensations of blue, yellow, and red.

Prints of this kind should be fixed in an acid hypo bath, sensitised with similar mediums, but having the same spectrum analysis as the developer, so as to prevent the hypo from affecting the delicate shadings of colour produced by this method.

"Thus," continued the speaker, "you will see how easily the difficult colour problem can be solved with ordinary every-day appliances."

In conclusion, Heliogabalus stated there was only one thing that had been withheld, viz., the proportion of dyes used in sensitising the developer. This was now a matter of experiment, and as soon as he could obtain a suitable combination of dyes for the purpose, such as had a universal spectral analysis, he would show the results in the colours of nature without stooping to such makeshifts as superimposure, triple impressions, gelatine films, or other transparent supports.

As a matter of fact he had been experimenting with a view of combining chrysoidine, fuchsine, aurine, eosine (blue and yellow), fluorescene, methyl-orange, corralline, malachite-green and naphthaline, in such a manner that the solution when added to a developer would reproduce in the coloured positive all shades of colour from the infra-red to the ultra-violet, no matter what primary, secondary or tertiary shades there might be in the original subject. Further, this would show that all the theory of wave-lengths of colour, spectrum analysis and colour sensations of the optical nerve existed merely in the imagination of the would-be photo-scientist.

Loud and long-continued applause followed. A number of negatives made by this process were then handed around and examined.

Mr. Ryttenhouse Shutter offered a vote of thanks.

Mr. Schnitzelhuber, Ph.D., C.n.G., that something more than a vote of thanks was due Mr. Wyk. With a mighty effort he had swept away all the cobwebs that had thus far clouded the photographic sky. He had never even heard of the like in Germany. Mr. Wyk had certainly outflown Dr. Vogel, outjolyed Prof. Joly, salivated Lippman, and proved DuHauron to be nothing more than a French sphinx in the Algerian desert. The solution of the great problem was now in sight, and the whole credit was due to Mr. Wyk. He therefore suggested that the new colour process when perfected should be called the HELIOGABLOTYPE.

This was passed with a standing vote, after which it was moved by Prof. Gobler and seconded by Dr. Oxalate Strong, that the aluminum gold medal be given to Mr. Heliogabalus Wyk, to show the world that the Turkeytown Hypo Club was ever ready to appreciate and recompense true photographic worth in their fellow-members.—Adopted unanimously.

Mr. R. Silverstayne then moved that the whole proceedings be published in the printed reports of the Society, with the proviso that the secretary copyright the same, to prevent the photogrophic journals thorughout the country from giving the new process publicity.—Adopted and adjourned.

J. FOCUS SNAPPSCHOTTE.

THE OFFICIAL PHOTOGRAPHIC COMPANY OF THE COTTON STATES EXPOSITION.

THE *Scientific American* of October 12 has the following protest against the photographic monopoly at the forthcoming Cotton States Exposition:—

"We are the well-wishers of the Cotton States Exposition, and, as such, we feel called upon publicly to express our surprise and regret that the management of this enterprise should have put a vexatious stumbling-block in the way of publications such as the *Scientific American* in the matter of illustrating the various buildings and exhibits of the Exposition.

"It had been our intention to illustrate very fully the progress of the South as shown at Atlanta, and for this purpose we had sent our special artist to the grounds with instructions to illustrate freely the most interesting features of the Fair. We find, however, that our intention is confronted point blank with a cast-iron agreement that must be made with a certain Official Photographic Company before a photograph or a sketch can be made in the grounds. It would seem from the wording of the blank 'agreement' that the Department of Publicity and Promotion has leased the privileges of photography and illustration to what is styled an Official Photographic Company, 'having certain exclusive photographic privileges on the grounds of said Exposition Company.'

"Before the illustrated press can make even so much as a sketch on the grounds it has to make application to this photographic company, agreeing as follows: 'That all pictures taken shall be submitted to the Official Photographic Company, which shall decide if it is the desire of said company to copyright such picture, which said company may do; that should we' (the press) 'desire to purchase from said official company any' of our own 'copyrighted photographs, we will preserve the same from any other use than that for which they are bought, to wit, for illustrating said Exposition in the columns of said publication only; that after any negatives bought from said company have served the purpose of illustrating, all such negatives shall be destroyed; that we will not permit any such negatives to be used in any other publication whatsoever.'

"Now, we had hoped that the blunder which the directors of the Chicago Exhibition made in this matter (and which they had the good sense later on to modify) would be avoided at Atlanta.

"The lavish illustration of this Exposition in papers with a circulation such as that of the *Scientific American* gives to an enterprise like this an amount of free advertising and indorsement that it could scarcely get in any other way, and surely the very least return that the directors could make would be to give the illustrated press every possible facility and assistance in their work of illustration. It seems to us that the mere promptings of courtesy would suggest such a course.

"Instead of this, we are confronted with an impossible agreement, which we are supposed to enter into with a certain company, which has leased the photographic privileges for the sole purpose of coining every dollar possible out of the bargain.

"The power of copyright, as mentioned in the agreement, is vexatious as it stands; but, when it is supplemented with a provision that after illustration such negatives, pictures, &c., shall be destroyed, the matter verges on the ridiculous, and shows, at least, that the managers of the Atlanta Exposition are thoroughly ignorant of the working of an illustrated newspaper office. The provision that such illustrated paper 'will not permit any such picture to be used in any other publication whatsoever' is equally ridiculous and impossible. There is not a day passes that we do not receive requests from all over the world for permission to reproduce our illustrations in other journals. It is certain that, for the mere pecuniary benefit of an Atlanta Exposition concessionaire, we are not prepared to place illustrations in our journal, which will be closed against similar requests from our contemporaries in the future.

"The revenue derived by the Exposition from this concession cannot be very large. Certainly it cannot be large enough to compensate for the serious curtailment that it will produce in the amount of space that will be devoted by the illustrated press to the interests of the Exposition.

"Considered merely from the standpoint of finance, the policy is short-sighted, and defeats the very end at which it aims. At best the revenue derived from this concession can be but limited; whereas the free advertisement, both pictorial and written, by illustrated journals such as our own, would interest the public, and undoubtedly bring many thousands to the fair who otherwise, but for the suggestion, would stay away. It is evident that the revenue derived from such visitors would far exceed the paltry sum which this vexatious and ill-conceived concession will bring to the Exposition exchequer.

"The Cotton States Exposition has opened auspiciously. The executive body has shown itself capable and, except in regard to the matter under discussion, possessed of good judgment. We hope that, following the example of Chicago, they will remove this embargo in full or in part, at least so far as to leave to the illustrated press representatives a free hand in their work."

Our Editorial Table.

Instantaneous Photography.

By Captain W. de W. Abney, C.B., R.E.
London: Sampson Low & Co. 96 pp. Price 1s.

Captain Abney's book, the second of a series of photographic primers, will be welcomed by all who go in for instantaneous work and desire to strike, as it were, a little below the surface of the subject and grasp the science of the branch of photography they are practising. Shutters, their speed and efficiency, lenses and plates for instantaneous work, development, flashlight and spark photography are among some of the topics handled. Says the author: "There are very few shutters extant which give an exposure of the $\frac{1}{100}$th of a second; the $\frac{1}{50}$th of a second is much more common. As a rule, for distant views, with figures not too close, the $\frac{1}{20}$th of a second is the shortest exposure that is absolutely necessary, whilst many objects need not have less than $\frac{1}{10}$th of a second, such objects being breaking waves and ordinary landscapes, even with trees blowing about, and so on." Some of the matter in the book is reprint, but this in no way detracts from its sound theoretical and practical wisdom.

Photographic Christmas Cards and Mounts.

Mr. Wilfred Emery, of 8, Dyne-road, Brondesbury, has sent us a few specimens of small photographs mounted on cards specially designed for use at the coming Christmas season. They form pretty and tasteful substitutes for the old-fashioned Christmas and New Year's cards, and are very cheap.

Messrs. Percy Lund & Co., of Bradford, are to be congratulated on the excellence and suitability of the assortment of mounts for Christmas photographic "cards," which they have sent us. The designs are of a variegated nature, and marked by refinement and delicacy.

Burton's Manual of Photography.

Bradford: Percy Lund & Co. 184 pp. Price 1s. net.

Intended as it is for the use of the beginner in photographic work, Professor W. K. Burton has in this volume succeeded in discussing his subject in simple and lucid language, at no sacrifice of thoroughness or completeness of treatment. The *Manual* (this, by the way, is at least the third time this title has been selected) forms an excellent introduction to the practice of amateur photographic work, and we can heartily recommend it. The information has been well condensed.

The A B C of Retouching.

By Andrew Young. Bradford: Percy Lund & Co. 56 pp. Price 6d.

This booklet forms No. 6 of the publishers' "Popular Photographic Series," and is one of the best little treatises on retouching we have read. The author tells us how to retouch portraits, landscapes, and prints, and fully describes all the operations and difficulties that have to be gone through in each of those branches of retouching work. The hints and recommendations given have evidently been drawn from practical acquaintance with the subject, and the booklet is one well calculated to be serviceable to amateurs as well as professionals.

George Mason & Co.'s Photographic List and Guide.

Messrs. George Mason & Co., of 180–186, Sauchiehall-street, Glasgow, have forwarded us their photographic list and guide. This is a well-printed and fully illustrated volume of over 272 pages, the catalogue portion of which concerns itself with descriptions and prices of a large variety of lenses, cameras, stands, shutters, mounts, accessories, lanterns, and the hundred-and-one requirements of the photographer. About fifty pages of the book are given up to a series of well-chosen hints, instructions, and formulæ dealing with the practical working of various processes, in which much useful information is contained. The "supplement" to the list and guide extends to 160 pages, and it catalogues all the newest and most recent introductions in the way of apparatus, &c. Messrs. Mason's List and Guide quite bears out its title to be considered "a daily reference-book of value for both professional and amateur."

Movement.

By E. J. Marey, Member of the French Institute. London: William Heineman.

This is a translation by Mr. Eric Pritchard of a book by M. Marey, of the French Institute, who, as our readers are well aware, has for years past made chronophotography the subject of special study and work. Succinctly described, Marey's book, portions of which have, we believe, been published from time to time in the French *La Nature*, deals with the photographic analysis of movement, particular and comparative, as applied to men, animals, birds, insects, &c. The early chapters are concerned with expounding the philosophy of time-measurement of moving objects by means of photography, and the measurement and representation of space by the same agency. These two chapters serve the purposes of an introduction, and we then pass to the measurement and representation of movement; and, the chronophotographic apparatus and some of its uses having been described, chronophotography with fixed and moving plates is exhaustively discussed, and the succeeding chapters deal objectively with the movements of men, quadrupeds, the locomotion of the inhabitants of water, aerial locomotion, the flight of insects, &c., &c.

About two hundred illustrations are given in the book, the salient features only of which have we indicated. Indeed, it is impossible within the limits of this short notice to deal as fully and as justly as is required with a work which is the record of a triumph in pressing photography into the service of a peculiarly difficult and fascinating study. We shall shortly have occasion to revert to Marey's book, which in the mean while we can cordially recommend to those interested in the photography of moving objects. A word of praise is due to the translator, who has done his work well.

News and Notes.

The Hackney Exhibition.—The last day for entries is October 29.

The Second Intercolonial Exhibition and Congress of Photography, open to all professional and amateur photographers of Australasia, is to be held under the auspices of the Working Men's College Photographic Club and the Exhibition Trustees, Melbourne, next year, commencing on Thursday, April 2, 1896.

Mr. T. Kipling, of 3, Queen-street, Durham, writes: "The following actually was said to my son a day or two ago:—Young Lady (*loq.*): 'I am going to sit again for my cabinets. The buttons on my jacket are like saucers, and I know what did it. You kept the cap off too long, and the buttons kept growing bigger and bigger all the time!'"

Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, October 30 (Travellers' Night). Messrs. F. A. Bridge and A. Bridgeman will give a lantern entertainment, entitled *Holland and the Hollanders*. Visitors are always welcomed by the members.

On Sunday, October 20, under the auspices of the Tyneside Sunday Lecture Society, Professor Boys, F.R.S., &c., delivered a lecture on the *Photography of Flying Bullets*. Commencing with objects moving at what the Professor turned the snail-crawling speed of 100 miles an hour, and describing the methods used to photograph these, he led up to projectiles travelling at high velocities. The lecture was illustrated throughout by the lantern, and the pictures, showing, as they did, not only the bullet sharp and clear, but the sound waves of compressed air, were highly appreciated by the audience. Some beautiful slides of bursting soap bubbles were also shown. The Tyne Theatre, where the lecture was given, was well filled, and altogether a pleasant and instructive evening was spent.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 19,278.—"A Device for use in Mounting Photographs and the like." R. J. Kerr.—*Dated October*, 1895.

No. 19,541.—"Improvements in Photographic Cameras." L. J. R. Holst.—*Dated October*, 1895.

No. 19,606.—"A New or Improved Plummet or Level, particularly applicable for use upon Photographic Cameras." F. P. Newley.—*Dated October*, 1895.

No. 19,616.—"Improvements in Dishes for Photographic Purposes." E. L. C. Lambert.—*Dated October*, 1895.

PATENTS COMPLETED.

Improved Apparatus for Automaticallly Registering the Exposure of Photographic Plates and Films.

No. 17,688. James Randolph Courtenay Gale, M.A., 3, Egmont-road, Sutton, Surrey, and James William Thomas Cadett, Ashtead, Surrey.—*September* 18, 1895.

This invention has for its object, firstly, to automatically register the exposure of the plate or plates, or film or films, contained in a photographic dark slide, by means of a suitable indicator; and, secondly, to ensure the automatic return of such indicator to its original position upon opening such slide. To effect this we mount upon the slide, in any convenient manner and position, a face plate, having a suitable index therein or thereon. Pivoted thereto is an indicator, which, on withdrawing the shutter of the dark slide and exposing the plate or film, is brought opposite the index, thus registering such exposure. A suitable catch retains the indicator in this position until the dark slide is opened, when the catch is released, and the indicator—either by gravity, or by mechanical pressure, or otherwise—automatically returns to its original position in readiness to register the next exposure. The travel of the indicator is regulated by a suitable stop or stops. In the case of a double dark slide, each slide is furnished with an exposure indicator. If desired, the face plate may be dispensed with, and the index mechanism may be mounted directly on the dark slide in any convenient manner and position.

The claims are :—1. In combination with a photographic dark slide, an indicating apparatus for automatically recording the exposure of photographic plates and films, which automatically resets itself in readiness for the next exposure, all substantially as hereinbefore described and shown. 2. The improved construction of automatic indicating and resetting apparatus for recording the exposure of photographic plates and films, all substantially as hereinbefore described and shown. 3. The various modifications of such improved automatic recording and resetting apparatus for indicating the exposure of photographic plates and films, all substantially as hereinbefore described and shown.

Improvements in Papers for Photographic Purposes.

No. 14,104. Hermann Wandrowsky, Ehrenfeld, near Cologne, on the Rhine, in the Province of Rhineland and Kingdom of Prussia.—*September* 21, 1895.

The sensitive papers used for photographic purposes, which are prepared in such a way, with silver nitrate solution or emulsion, that there is still free silver nitrate present in the sensitive layer, suffer from the disadvantage that they become very quickly brown on the reverse side of the paper. The reason of this is, that the silver nitrate, which penetrates from the sensitive layer into the layer of paper lying under it, attacks and destroys more or less the paper fibres, as well as all other organic stuffs that may be present in the paper layer.

It is true that attempts have been made, by the addition of acids, to prevent the paper becoming brown. These acids, however, either formed no silver combination at all, or only very weak ones, and thus, on the one hand, did not fulfil their object, on the other hand they produced a number of minor noxious effects, which rendered their use still less desirable.

By the new process a paper is produced which in every respect fulfils all requirements.

This process consists in introducing into the paper intended for photographic purposes, at the time of its manufacture or later on, a salt which, by a double decomposition, turns the silver nitrate into a preparation of silver, which is insoluble, or very nearly so, in water, but easily soluble in sulphite of soda, and is active in the development of the picture.

In sensitive papers which consist of barytes papers it is advisable to add the salts to the layer of barytes as well as to the raw paper.

Salts suitable for the purpose in question are the salts of oxalic acid, tartaric acid, acetic acid, citric acid, benzoic acid, and succinic acid, which, with silver nitrate, give the corresponding silver combinations by double decomposition. The salts must be present to such an extent in the paper layer that they are capable of decomposing entirely the silver nitrate.

In the picture layer of the copying paper the presence of free silver nitrate is absolutely necessary for obtaining a good picture. This is also obtained by my process, for only the silver nitrate that actually penetrates into the paper layer itself is changed by the salts, thus preventing the former from becoming brown, while a surplus of silver nitrate remains behind in the picture layer.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is :—Paper, which is to be made sensitive for photographic purposes by solutions and emulsions containing silver nitrate, thereby distinguished, that, by suitable salts incorporated in the paper layer, the silver nitrate penetrating from the sensitive layer into the paper layer is changed into another compound that does not turn the paper brown by double decomposition, thus preventing the sensitive paper from becoming brown when it is warehoused.

An Improved Photographic Shutter.

No. 19,329. Alfred Charles Jackson, Crown Works, 98A, Amhurst-road, Stoke Newington.—*September* 21, 1895.

The special feature of this invention consists in combining five distinct actions on a single plate, four of which are well known and one is novel.

The four known actions are as follows :—(1) The safety ever-set shutter, (2) the instantaneous time action, (3) revolving stops or slides, and (4) a focussing tube which slides on to the end of the lens tube or nozzle. These have not hitherto been combined on one metal plate, as I now propose to do, and I combine with them two small brackets or angular strips, projecting from the plate at right angles, to be used for steadying or fixing the plate when focussing.

To the foregoing I add the following novel action, (5), which I have designed to obtain and indicate to the operator varying degrees of speed in the motion of the shutter :—On the outer side of the plate is a small cranked handle, connected to a small spindle passing through the plate. At the back of the plate this spindle is connected to another crank, to the end of which the shutter spring is fastened. The outer crank travels on a segmental scale, on which Fast, Moderate, and Slow, or other words, are marked, and it carries on its extremity a small point which engages with holes in the plate, so as to hold it in any desired position. By holding the crank handle so as to stretch the spring tightly, a higher speed can be obtained in the action of the shutter.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

October.	Name of Society.	Subject.
28	Camera Club	*Light in Photography.*—IV. Captain W. de W. Abney.
28	Lantern Society	
28	North Middlesex	
23	Oxford Camera Club	*India.* Colonel Impey.
28	Richmond	*The Lantern and its Manipulation.* J. H. Alabaster.
28	Southport	Opening Day of Exhibition.
29	Birmingham Photo. Society	Members' Lantern Evening.
29	Brixton and Clapham	
29	Hackney	
29	Halifax Camera Club	
29	Lancaster	
29	Leith	
29	Paisley	
29	Warrington	
30	Bath	
30	Burnley	
30	Croydon Camera Club	Lantern Night.
30	Leytonstone	*A Day in Winchester.* Claude S. Scott.
30	Newton Heath	*The Carbon Process.* T. Glazebrook.
30	Photographic Club	*Holland and the Hollanders.* F. A. Bridge and A. Bridgman.
30	Putney	*The Preparation of Negatives for Printing.* F. T. Beeson.
31	Birmingham Photo. Society	Last Day for sending in Competition Pictures for September Excursions.
31	Bradford	*On Flashlight Photography.* Mr. Homburgh.
31	Camera Club	*The Struggle in the Dark Room.* G. P. Newman.
31	Ealing	Ordinary Meeting.
31	Glossop Dale	
31	Halifax Photo. Club	
31	Handsworth	*Composition of a Picture.* Walter J. Morgan, R.B.A.
31	Hull	
31	Liverpool Amateur	Lantern Lecture by E. R. Dibdin.
31	London and Provincial	
31	Oldham	
November.		
1	Birkenhead Photo. Asso.	Lantern Evening: The Procter Prizes.
1	Cardiff	
1	Croydon Microscopical	Conversational Meeting.
1	Holborn	
1	Leamington	
1	Lewisham	Members' Lantern Evening.
1	Maidstone	
1	North Kent	
1	Plymouth	*In Search of the Picturesque and Historical with the Camera.* H. S. Hill.
2	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

October 22,—Technical Meeting,—Mr. E. Crofton in the chair.

The Hon. Secretary exhibited a print from a negative taken by Mr. Shapoor Bhedwar by the electric light.

Mr. Agar Baugh exhibited three lenses which had been lent to him by Messrs. Zeiss—a portrait lens, working at *f*·4·5; an anastigmat, one combination of which formed an excellent landscape lens, with an aperture of *f*·12·5; and a tele-photographic lens, with a single achromatic combination in front, aperture about *f*·4, and a small negative.

Mr. T. R. Dallmeyer described the Dallmeyer-Bergheim portrait lens, with rack-and-pinion attachment, for giving different foci, a specimen of which is included in the Exhibition, together with photographs taken with it. He said Mr. Bergheim was one among a great many photographers who appreciated the good effect, with regard to the perspective and modelling of the figure, which was invariably obtained by the use of long-focus lenses, and having found that, in the opinion of his artist friends, the definition of a lens involving the principle of tele-photo construction was of too critical a character, he had asked Mr. Dallmeyer's firm to undertake an optical construction which should maintain a consistent type of definition all over the plate. The instrument now exhibited fulfilled this requirement, and at full aperture gave a uniformly diffused definition, the degree of diffusion being identical, no one plane being in better focus than another. Photographs of any size, from *carte* to life size, could be taken with the same lens in the same studio, the size depending upon the separation of the lenses, the distance from the object, and camera extension, the equivalent foci varying from thirty-six inches to seventy-two inches. The diameter of the lens was four and a half inches, and at the shortest focus thirty-six inches; it worked at *f*·9, which Mr. Bergheim had

found sufficiently rapid for studio work. Mr. Dallmeyer showed several photographs of different sizes, taken with the same lens in a studio about twenty feet in length; also Burchett's colour screen, with a new tint of green glass, and a new form of unsymmetrical negative objective, designed to give a flat field with moderate magnification.

In reply to a question by Mr. E. J. Wall,

The HON. SECRETARY said that the apertures of the Zeiss lenses shown were calculated upon the proportion existing between the focal length and the aperture, not between the focal length and the simple measurement of the diaphragm, as in the English system.

Mr. JOHN A. HODGES then read a paper on *Lantern-slide Making as an Art*. Lantern slides, he said, were still looked upon by some photographers with undisguised contempt; these, however, were for the most part the gentlemen who knew all about art but very little of technical photography. A lantern transparency that was both technically and pictorially good deserved to rank high among photographic reproduction methods, and what printing process existed which could so faithfully render the beautiful gradation of a perfect negative? It had been objected that the magnification of a slide upon the screen produced coarseness of effect; but this was the fault partly of the slide-maker and partly of the exhibitor. The artistic qualities of many slides were destroyed by the use of too large a screen and too powerful a light. The most fatal error of slide-makers was the sacrifice of every good quality in order to secure what was too often an unnatural brilliancy, the public generally preferring slides possessing an undue amount of contrast. There was great room for improvement in the quality of commercial slides, due to the employment of unsuitable negatives, and to want of care in the working of the process (wet collodion) almost universally employed in their production. These strictures referred more particularly to subjects of an essentially pictorial character, and he suggested that slide-manufacturers should give their old negatives a well-earned repose, and entrust their replacement to photographers having artistic as well as technical ability. A great deal more depended upon the worker than upon the process employed, and he inclined to the opinion that no one process could be called "best." As between contact printing and reduction, he thought one method presented no advantage over the other. While admitting that gelatine was responsible for more bad slides than any other process, he had, after careful examination, come to the conclusion that, by its means, slides could be produced which, from a technical point of view, would be at least equal to any obtained by older and more highly extolled methods. Rapid lantern plates should be avoided, though some were capable of yielding fine results. For warm tones, a pyro developer, properly used, was unrivalled, and he found the following formula would give a rich, warm brown, the plate receiving a very full exposure:—

Sulphite of soda	240 grains.
Distilled water	35 ounces.
Citric acid	30 grains.
Pyro	40 ,,

For use, take two ounces; add from thirty to forty minims of ten per cent. solution of bromide of potash, four to six minims of ammonia, and twenty to thirty minims of ten per cent. solution of ammonium carbonate.

With regard to the judging of slides at open competitions, there was no doubt that in selecting Judges regard was had more to the pictures than the slides, and he suggested that gentlemen recognised as experts in this branch of photography should be entrusted with the examination of slides. Mr. Tulloch had advocated the printing of lantern slides with a white margin, and with this opinion Mr. Hodges heartily agreed. The majority of "moonlight effects" were grossly untrue to nature, and the "catchy" effect due to excessive contrast of light and shadow was as offensive to a trained eye as it was false to nature; those who were fond of such effects should remember that clouds, however heavy in themselves, were always luminous, the golden rule being to keep the shadows luminous and avoid undue opacity. Mr. Hodges showed a number of slides to illustrate the points raised in his paper.

Mr. W. ENGLAND said the cause of so many unsatisfactory commercial slides was the demand for cheapness, and he suggested as particularly good developer the use of a mixture of hydroquinone and metol.

A vote of thanks was passed to Mr. Hodges, and the meeting adjoured.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 17,—Mr. R. P. Drage in the chair.

Two gentlemen were proposed for membership.

The Hon. Secretary distributed a number of circulars relating to a developing competition, organized by Mr. Alfred Watkins, in connexion with the Photographic Club. He also read a circular letter from the Liverpool Amateur Photographic Association in aid of a fund on behalf of the widow of the late Mr. B. J. Sayce, and announced that the Committee thought, in view of the fact that the results of Mr. Sayce's work had been freely given to the world, that the Association be recommended to contribute the sum of two guineas to the same.

Mr. W. E. DEBENHAM, in proposing that the suggestion of the Committee be carried out, thought, however, that it should not be forgotten that Mr. W. B. Bolton was associated with Mr. Sayce, and that the result of their researches was published in their joint names. It should not be supposed that Mr. Bolton was without credit in the matter.

Mr. MACKIE seconded the proposition, which was carried *nem. con.*

Mr. W. E. Debenham distributed some collotype prints of the group taken at the joint outing of the London and Provincial and Photographic Club, made by W. T. Wilkinson.

Mr. BEDDING presented to the Association *Instantaneous Photography*, by Captain Abney, and also a new stereoscope, which he said possessed the merit of having achromatic lenses, which were separable to suit the eyes.

Mr. J. E. HODD noticed that the centres of the lenses were only one and one-eighth of an inch from the base plate, and, therefore, to see properly, one should have pictures of only two and a quarter inches in height.

Mr. BEDDING showed that that would be remedied by the weight of the transparency, by reason of the tendency of the carrier to sag down when drawn out. He had used stereographs five inches in height in the same instrument, and thought that in actual practice nothing would be noticed.

A rambling discussion on various lenses ensued, during which a negative, taken by Mr. Henderson with a Cooke lens, was passed round.

The HON. SECRETARY remarked upon the results obtained in a comparative test of the new Cooke lens and a rapid rectilinear of good make, and drew attention to what he thought rather conflicting statements by the makers of the Concentric lens.

Mr. DEBENHAM, replying to a request for information by the Hon. Secretary, thought the Concentric the best he had ever used. He had not found flare spots or any secondary image.

It was announced that the following prizes had been offered for competition by Mr. Henderson:—(1) For the most valuable paper read during the year, five guineas; (2) For the second best, three guineas; (3) For the two best pictures taken by a member during the year, one guinea; (4) For the best six slides by a member, one guinea.

Mr. HODD asked whether anybody had experienced the same difficulty he had had in getting sufficient density on certain rapid dry plates. Many cases had been brought before his notice this season. He had used all sorts of developers, but without success.

Mr. MACKIE suggested the use of a lot more pyro, six to eight grains instead of two, to the ounce, as a possible remedy.

The HON. SECRETARY inquired whether one could take a negative after development and destroy the image by getting rid of the whole of the silver deposit in the film, so that it could not be redeveloped.

Various opinions were given, but Mr. DEBENHAM thought it had been said that it could be redeveloped.

PHOTOGRAPHIC CLUB.

OCTOBER 16,—Mr. J. R. Williams in the chair.

The CHAIRMAN having drawn attention to some collotype pictures on the table, said that the best thanks of the members were due to Mr. Debenham for having made the negatives, and to Mr. Wilkinson for making the prints.

A hearty vote of thanks was passed to both gentlemen.

Messrs. E. H. Hobbs and W. R. Stretton were unanimously elected members of the Club.

Mr. Wallis passed round some prints on the palladium paper, taken last week. They were not at all satisfactory. He used negatives that gave good results upon P.O.P.

Mr. WELFORD then read his paper, entitled *Some Idle Thoughts on Photographic Societies* (see page 679).

Mr. WILMER remarked, at the conclusion, that Mr. Welford had omitted one type, and that was the "Listener," to which group he felt that he belonged, for he had listened with great pleasure to his admirable paper. He thought Mr. Welford had combined two of the types in himself—the Orator and the Please-all.

Mr. BEDDING made a few remarks, reminding Mr. Welford that the latter remarks in his paper had been somewhat forestalled by the proceedings of the Photographic Club. He agreed with Mr. Welford in some of the suggestions he made.

Mr. WELFORD replied to some of the remarks passed. He said that Mr. Bedding's remark was not quite to the point, as most of the paper had no connexion with the Photographic Club. Mr. Debenham's also did not apply, as he thought all would agree with him that he had carefully avoided anything like personalities.

Messrs. J. Stuart (Glasgow) and W. Crooke (Edinburgh) were warmly welcomed. Both gentlemen made a few remarks. Each agreed that they were agreeably disappointed, for they had entered with the idea they would join a *monthly* meeting, but to be told that such a meeting occurred once every seven days was certainly a surprise to them both. The gathering of matter for such meetings must be a formidable task, and they sympathised with the officer whose duty it was to gather it.

Mr. DEBENHAM, referring to the meeting en the 23rd, said that he strongly objected to the term "platino" in connexion with bromide paper, as it could not help but mislead many.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE Fortieth Annual Meeting was held on Thursday, the 10th inst., at 36, George-street, the President (Mr. H. M. Whitefield) in the chair.

Messrs. F. W. Masters, W. Ormerod, E. H. Turner, A.C.A., and A. Whowell were elected members.

The HON. SECRETARY (Mr. A. E. Casson) read the following report:—

REPORT OF THE COUNCIL TO THE MEMBERS OF THE MANCHESTER PHOTOGRAPHIC SOCIETY.

Your Council has much pleasure in submitting to the members the annual report of the Society's fortieth session. In reviewing the past twelve months' work, it is gratifying to know there has been an increased interest maintained amongst the members.

Although your attention was drawn at the last annnal meeting to the want of "helping hands" towards the providing of subjects at the general meetings, there is still the tendency to leave the work in the hands of a few, while several members who are known to take a keen interest in photography have been lax in coming forward.

The meetings held during the year have been twelve, with an average attendance of twenty-two at each meeting. There are eighty-nine members on the roll, out of which six were elected as new members during the year.

The ordinary meetings have had, from a practical point of view, more of a scientific and experimental aspect, and the demonstrations from time to time were very successful in enlisting the interest of members.

In November, 1894, Mr. E. H. Turner enhibited his apparatus for enlarging, reducing, and copying by means of ordinary gaslight, and successfully demonstrated its use.

The December meeting took the form of a social evening, but the Council regrets to state that the proceedings were carried out with but little enthusiasm on the part of the members.

In January, 1895, Mr. J. Wood gave a paper on *Stereography*, and blackboard sketches were introduced to elucidate the action of lenses as aids to stereoscopic vision.

In February Mr. A. Brothers delivered an address on *Stellar Photography*, and, by favour of the British Astronomical Society in London, was enabled to illustrate his remarks by the exhibition of many interesting lantern slides.

In March two papers were read, by Mr. F. W. Andrew and the Hon. Secretary (Mr. A. E. Casson), the subject being *Enlarging*. The former brought Hulme's cantilever lantern, while the latter exhibited his apparatus, utilising the new incandescent gaslight.

The subjects at the April meeting were varied. Mr. W. H. Farrow showed a simple method of making a camera bellows; Mr. T. Chilton produced copies of Ackland's focussing scales for hand and copying cameras; Mr. J. Wood and the President (Mr. H. M. Whitefield) exhibited a series of lantern slides of the same subjects on the screen to compare the difference in treatment and in the results obtained by different workers under similar conditions.

In May Mr. T. R. Cobley showed samples of Hardcastle's printing-out platinum paper; Mr. H. Tomlinson exhibited several platinum prints, toned and finished by different processes; Mr. A. E. Casson gave a working demonstration of Schölzig's Otto and Presto papers.

For the June meeting Mr. A. E. Casson introduced the subject of orthochromatic photography, and demonstrated the advantage of using photographic plates prepared specially for the better rendering of colour values.

The July and August meetings were occupied in long discussions on the comparison of the covering powers of various lenses; and finally, for the September meeting, Mr. A. E. Casson contributed a paper on the working of Messrs. Wellington & Ward's new bromide papers.

The Saturday afternoon rambles cannot be recorded as satisfactory, for, with the exception of two, they were entirely abandoned.

The lantern section meetings proved to be of their usual attractive character, both to members and friends. The Society again contributes a collective set to the annual Exhibition of the Royal Photographic Society of Great Britain.

The Exhibition of members' work generally, held in the spring, was postponed until the autumn.

Many additions have been made to the library of books of reference, several of which have been presented by Messrs. A. Brothers and A. Heywood. These gentlemen deserve the best thanks of the members for their suitable gifts.

The thanks of the Society are also due to Mr. T. Chilton for his unremitting attention in sending the monthly reports to the *City News* and THE BRITISH JOURNAL OF PHOTOGRAPHY. The thanks of the Society are due to the publishers of various photographic periodicals for gratis copies sent during the year, and also to the firms who have contributed exhibits of apparatus and specimens, which have increased the interest of meetings.

In conclusion, the Council, in retiring from office, desires that the welfare of the Society will be fully sustained in the future, and with confidence leaves the election of its successor to the members who are gathered here this evening.

Mr. W. G. COOTE (the Hon. Treasurer) passed round to each member the balance-sheet, which showed an increased balance in favour of the Society, which the president referred to as being the most favourable for some years.

The reports were adopted, and the election of officers next took place, and resulted as follows:—*President:* Mr. H. M. Whitefield.—*Vice-Presidents:* Messrs. F. W. Andrew, A. Brothers, F.R.A.S., F. W. Burt, T. Chilton, and F. Edwards.—*Council:* Messrs. C. H. Coote, S. L. Coulthurst, J. Hyde, H. V. Lawes, W. Tomlinson, H. Wade, J. Warburton, J. Whittaker, J. C. Wolfenden, and J. W. Young.—*Lantern Committee:* Messrs. F. Edwards, W. Tomlinson, J. Whittaker, and J. C. Wolfenden.—*Curator:* Mr. J. Whittaker.—*Librarian:* Mr. C. H. Coote.—*Hon. Treasurer:* Mr. W. G. Coote.—*Hon. Secretary:* Mr. A. E. Casson.

A proposed alteration of rule, made by Mr. Chilton, to abolish the summer meetings, held in June, July, and August, was defeated by a large majority.

Brixton and Clapham Camera Club.—On Friday, the 11th inst., a *conversazione* was held at the Clarence Rooms, Coldharbour-lane, S.W., attended by about 200 members and friends. The programme included musical selections by Miss Isabel Thompson, Messrs. Willie Fraser, R. H. Pickel, and C. F. Archer; recitations by Miss Dora Gregory and Mr. Adrian Harley; the exhibition, for the first time in London, of the *Amateur Photographer* 1895 prize slides; also a series of scenes connected with hospital life, shown by Mr. W. Thomas. The walls of the drawing-room were decorated with a number of framed prints, the work of members, while other friends lent microscopes, stereoscopes, &c. The latest novelties in photographic apparatus were shown by the Prosser Roberts Drug Company, Parke's Drug Stores, and the European Blair Camera Company. Mr. M. Atkinson had charge of the refreshment department, and it was generally agreed that at no future event of the kind could the Club dispense with the inimitable services of Mr. A. as Genie of the Coffee Cup. Several visitors gave in their names as intending members.

ON Tuesday, the 15th inst., at the usual weekly meeting at Brixton Hall, the skate-blade print-trimmer was shown by Mr. Montague Atkinson, and results obtained by members on Messrs. Wellington & Ward's Sylvio and bromide papers were passed round. A discussion arose as to the relative merits of the gelatine dry plates and the carbon process in making the transparency for an enlarged negative, and, the disputants being unconvinced at the close of the meeting, it was arranged to practically test the point on some convenient evening. Mr. F. W. Edwards is expected to demonstrate the platinotype process at an early date, particulars of which, with cards of admission, may be obtained from the Hon. Secretary, 11, Corrance-road, Acre-lane, S.W.

Croydon Camera Club.—A crowded attendance of members on Wednesday, 16, listened to an address on *Enlarging with the Incandescent Gaslight*, by Mr. John A. Hodges, F.R.P.S. In introducing the lecturer, the President (Mr. Hector Maclean), dwelt upon the need of an easily available cheap illuminant for enlarging purposes, and mentioned that he had examined the enlarging lantern and enlargements of Mr. Dresser, both of which gave favourable witness of the incandescent lamp's utility. None the less, he knew that various members of the Club had complained of the unequal illumination of the picture where the above light is used with a condenser. Mr. Maclean also made passing reference to the coarse grain in certain makes of dry plates, which under some circumstances was very harmful in enlargements, and suggested that a microscopic investigation should be held to determine whether any "extra" rapid plate now procurable is free from this defect. Mr. Hodges' address, which was followed with much attention, will be printed *in extenso*. At its close the President elicited that the ratio of the duration of exposure between the incandescent burner, used *with* a condenser, compared with its use *without* a condenser, is as 1 to 100. In the latter case, two burners and a flat white surface are employed, the negative being illuminated by means of reflected light. Mr. Hodges stated that he did not find that a clean talc chimney unduly prolonged the exposure, which, enlarging from quarter-plate to twelve inches by ten inches with Ilford rapid paper, was only three seconds. Messrs. Noaks and Linton considered magnesium ribbon preferable for enlarging by reflection. Not the least interesting portion of the evening's transactions was the brilliant practical demonstrations which Mr. J. Noaks, assisted by Mr. Bown, gave of the use of the incandescent light for enlarging. Employing a lamp of his own construction, Mr. Noaks made a fine bromide picture, measuring twelve inches by ten inches, from a quarter-plate negative, giving an exposure of fifteen seconds. The resulting print was all that could be desired, and was deservedly admired. Before the meeting separated, the President drew attention to the telling reproduction of a photograph by a member (Mr. G. W. Jenkins), which appeared in last week's *St. James's Budget*.

Hackney Photographic Society.—On the 15th inst., Mr. E. Puttock presiding, several members showed results obtained on the samples of the Wellington bromide paper, and spoke very favourably of it. Mr. W. L. BARKER, referring to dry-plate boxes, spoke of the difficulty, when using plates of different brands, of identifying each after the outside wrapper had been removed. This could be easily obviated by the makers putting a label on the box as well as on the wrapper. The latter half of the evening was devoted to the exhibition of slides, after which members' slides were shown.

Putney Photographic Society.—The first meeting of the winter session was held on Tuesday, October 15, Dr. W. J. Sheppard (Vice-President) in the chair.—Mr. JOHN A. HODGES (Vice-President) delivered his lantern lecture, *Through Lakeland with a Camera*, giving an interesting and descriptive account of each slide, which was much appreciated by the members and friends assembled.

Woodford Photographic Society.—The Second Annual Meeting was held on the 17th inst., Mr. E. B. Caird in the chair. After the usual routine business had been transacted, including a vote of thanks to the officers of the past year, the election of officers for the ensuing year was proceeded with. Mr. Malby was elected President, Messrs. Caird, Marriage, Smith, and Noble appointed members of Council, the latter gentleman undertaking the duties of lanternist, while Mr. Emler was appointed Hon. Secretary and Treasurer. The medal gained by Mr. Marriage for lantern slides at the Pall Mall Exhibition was passed round for members' inspection. Four new members were elected.

Woolwich Photographic Society.—The Annual Meeting of this Society was held last Thursday in the lecture-room of St. John's Schools, Woolwich, Colonel C. D. D. Davies presiding. The preliminary business included the election of six new members. The balance sheet was then read by the Secretary, and showed that the finances of the Society are in a satisfactory condition. The report of the Council expressed satisfaction with the steady growth of the Society and its generally prosperous condition. It remarked upon the enthusiasm existing amongst the members, who have built up a useful institution in the town. The Council advocate a forward policy, and their efforts will be directed specially this coming session to the help of the more inexperienced members; first, by providing demonstrations of an elementary nature, and undertaken by the older workers; and, secondly, by a course of lectures to be given by a popular instructor, and in addition to which the ordinary programme will be found attractive and instructing. In order to relieve the Secretary of some of the work which falls upon him, the members decided to alter the rule so as to provide for the appointment of an Hon. Assistant Secretary. The officers for the year are as follows:—*President:* Colonel C. D. Davies.—*Vice-Presidents:* Rev. S. E. Chettoe and Messrs. W. H. Dawson and H. H. Barker.—*Council:* Messrs. J. Calder, W. G. Champion, J. Cregan, J. Desforges, W. R. Dunger, and F. T. Hards.—*Auditors:* Messrs. J. Allen, and J. Thompson.—*Librarian:* Mr. H. J. Maskell.—*Hon. Secretary* and *Treasurer:* Mr. J. Borthwick Panting.—*Hon. Assistant Secretary:* Mr. F. W. Machen. The retiring officers and members of Council were cordially thanked for their services to the Society.

Bradford Photographic Society.—A large and enthusiastic meeting was held at the Unity Rooms on October 17, Mr. O. Nicholson in the chair. The business of the evening was a lecture and demonstration of the *Carbon Process*, by Mr. P. R. SALMON. The lecturer, in his opening remarks, dwelt briefly with the first experiments of working with carbon as a basis. At last the time came when Swan made his greatest and final improvement, which he presented to the world on April 15, 1864. The manufacture of the paper, the action of potassium bichromate, &c., were then explained. The lecturer dived deeply into the theoretical portion, but in such a simple way that even the youngest member present could not get lost. He referred to its great popularity in the early seventies, to its apparent death, and finally to its slow but sure revival. As a proof of this, he said that in the Pall Mall Exhibition of 1893 there were forty-eight by the process, in 1894 the number had increased to about ninety, and this year there was no less than 120. People, he said, were beginning to appreciate a paper that possessed so many advantages, amongst which were its permanency and the great variety of colours. Proceeding to the practical portion, Mr. Salmon successfully developed samples upon opal, paper, and

glass, using Elliott & Sons' tissues, which he fully explained as he went along. The lecturer showed a good selection of his own work, principally opals, and a fine collection of excellent work by Elliott & Son. Amongst the latter were a fine seascape, of a very natural colour; also a splendid enlargement in brown carbon of a lady's bust. The lecture ranks with the finest ever given before the Club. Mr. Salmon dealt with the subject in a masterly manner, and it is evidently one in which he is quite at home, and one does not wonder that he has received many invitations from other clubs for the same lecture. If they all take it up with the same enthusiasm the Bradford folks have done, there will be quite a "run" on Messrs. Elliott's factory. A lively discussion followed, and the lecturer was bombarded with some very curious and difficult questions, but he dismissed them in a praiseworthy manner, thus showing he was not to be "had." A vote of thanks, proposed by the Rev. W. H. Eastlake and seconded by Mr. R. J. Appleton, was carried unanimously.

Darwen Photographic Association.—The second meeting of the winter session was held on Thursday, October 17, in the form of a carbon demonstration, made by Mr. J. W. Wade, of the Manchester Amateur Photographic Society, the Vice-President (Mr. John Broome) in the chair.—Mr. WADE commenced by explaining the preliminary stages of the process, and giving a list of the permanent colours most advisable for use in colouring the pigment. The demonstrator then proceeded with the development, and, during this process, the same gentleman distributed a number of prints, some of which were defective. The latter Mr. Wade had produced for the purpose of showing the failures caused through faulty manipulation, and elucidating these difficulties in the development. About a dozen tissues were developed during the evening, most of which resulted in very beautiful pictures, the remainder having been vitiated by Mr. Wade during development to better enlighten the audience of the failures. Amongst the tissues developed was one a fortnight old, but printed the same day, this tissue only adding one in number to the failures through being old, time having so hardened the pigment as to make it almost insoluble. Whilst developing, Mr. Wade answered any questions which the members put before him, giving a number of useful hints, and particularly advising the use of fresh tissues, also not to keep the tissues after printing many hours before development. At the close of the meeting a hearty vote of thanks was moved in favour of the demonstrator for his highly appreciated services, and the kindness he has shown to the Association since the commencement.

Derby Photographic Society.—The first meeting of the winter session was held on Tuesday evening at Smith's Restaurant, Victoria-street, Mr. G. Walker presiding. The minutes of the last meeting were confirmed. Officers for the ensuing year were then elected as follows:—*President:* Captain W. de W. Abney, C.B., R.E., F.R.S., &c.—*Vice-President:* Mr. G. Walker.—*Committee:* Messrs. C. Bourdin, J. Fleet, E. Fearn, C. B. Keene, T. Walker, and R. Woods.—*Auditors:* Messrs. Gandy and T. Walker.—*Treasurer:* Mr. F. Gandy.—*Hon. Secretary:* Mr. T. A. Scotton, of 9, Church-street, Derby. The Hon. Secretary next distributed a quantity of sample packets of Wellington & Ward's new Sylvio printing-out paper and bromide paper. It was decided that the Society still be affiliated to the Royal Photographic Society, and Messrs. C. B. Keene and T. A. Scotton were elected delegates to the same. It was announced that pictures in connexion with the outdoor meeting competition should be sent in not later than December 2, 1895. Several very interesting novelties were brought forward, which led to a rather lengthy discussion, and altogether a very pleasant and instructive evening was spent. It was decided to hold a Social Evening on Tuesday, October 29, and it was hoped as many as possible would attend.

Leigh Photographic Society.—The Opening Meeting of the sixth session was held on Thursday last. The President (Mr. F. Burrows) presided.—The first of a series of competitions was held, the subject being Landscape (open view). Mr. R. Leigh gained the first prize with *Peel*, the second prize going to Mr. P. Seddon. The syllabus of the Instruction evenings to beginners was arranged:—*Cameras, Lens*, Mr. T. Haddock; *How I Develop*, Mr. W. Hampson; *Negatives and their Defects*, Mr. T. L. Syms; *Toning and Fixing*, Mr. W. R. Moore; *Mounts and Mountants*, Mr. T. Peters; *Bromide and Platinotype*, Mr. R. Leigh; *Copying*, Mr. T. L. Syms; and a competition for the best two lantern slides was arranged.

Oxford Camera Club.—The meeting of the Club on October 14 was devoted to a discussion of various printing methods, with exhibition of results obtained by them. Messrs. Elliott & Sons, Barnet, had kindly sent samples of their platino-bromide matt-surface paper for distribution among the members, as also had Messrs. Wellington & Ward, Elstree, Herts, both of their platino-bromide and of their Sylvio printing-out paper. Prints on each of these papers were shown by members, and, though in many cases they were unused to the working of bromide, they succeeded in producing good results. A hearty vote of thanks was passed both to Messrs. Elliott & Sons and to Messrs. Wellington & Ward for the samples sent, the members expressing themselves as very well pleased with the papers. Other printing processes were illustrated, including collodio-chloride, the only disadvantage of which seemed to be the brittleness of the surface, and mezzotype. A print in mezzotype by the Hon. Treasurer evoked much interest and commendation.

Brechin Photographic Association.—The First Ordinary Meeting for the season of the above Association was held in the rooms, Park-road, on Wednesday last, 16th inst., Mr. R. W. Duke in the chair. After business, an exhibition of the *Tit-Bits* slides, entitled *How Popular Periodicals are Produced*, was given. The slides were very favourably criticised by the members, and the lecture proved entertaining and instructive. The usual votes of thanks closed the meeting.

Photographic Society of Ireland.—The Opening Meeting of the session for 1895-6 took place at the Society's rooms, 35, Dawson-street, on Thursday, the 11th inst., when the President (Professor J. A. SCOTT, M.D.) delivered his address, in which he discoursed on the progress which has been made towards the development of colour photography, and described the different methods employed by Messrs. Ives and Joly. The President also referred to the various new lenses, especially the Cooke lens, with which he had been experimenting. The meeting, which took the form of a *soirée*, was largely attended by members and their friends, and a selection of musical items was contributed to by Miss Ruthven (piano), Miss Delaney (violin), Miss Brien (song), &c. Several of the members showed some slides, those by Mr. Ruthven being exceptionally good, as were also the instantaneous production of the Lawn Tennis Tournament, by Mr. R. M. Inglis. A lecturette was delivered, and slides were shown by Dr. Benson of his trip to the West Indies. Amongst those present we noticed the President, Mr. J. A. Scott, M.D., and Mrs. Scott; the Vice-Presidents, Messrs. Alfred Werner and L. R. Strangways; Mrs. Werner, Mrs. Strangways, Mr. J. A. C. Ruthven (Hon. Secretary), Mrs. and Miss Ruthven, Messrs. V. E. Smyth and R. M. Inglis, Mr. and Mrs. Woodworth, Mr. J. M. Keogh, Mr. and Miss Simpson, the Misses Brien, Dr. Benson, Dr. Scriven, Messrs. H. Curtis, P. C. Curtis, and J. H. Hargrave, Mr. and and Miss Gordon, Dr. and Mrs. Beaten, Messrs. Riddick and Walshe, Mrs. and the Misses Delany, &c.

FORTHCOMING EXHIBITIONS.

1895.	
Oct. 25–Nov. 2	*Photographic Salon. Alfred Maskell, Dudley Gallery, Piccadilly.
,, 25-Nov. 14	*Royal Photographic Society. R. Child Bayley, 12, Hanover-square, W.
,, 28, 29	East London Photographic Society. Hon. Exhibition Secretary, F. Uffindell, 29 Scrutton-street, Finsbury, E.C.
,, 28–Nov. 2	*Southport. G. Cross, 15, Cambridge-arcade, Southport.
Nov. 19–21	*Hackney. W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 22–30	*Stanley. Walter D. Welford, 59 and 60, Chancery-lane, W.C.
,, 28–30	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.
1896.— March	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

SCIENTIFIC (*SIC*) ADVERTISEMENT.

To the EDITOR.

"Look here upon this picture, and on this."—*Hamlet*, Act iii., Sc. 4.

SIR,—On my return from a few weeks' holiday I have been inundated with inquiries (from interested and disinterested parties) as to my opinion of an advertisement by Messrs. Taylor, Taylor, & Hobson appearing in your paper. I have hitherto given the reply that I had not seen it, but, now that my attention has been called to the matter, I think, with many others, that some public comment is necessary.

In the first place, I must apologise to you, Sir, for making reference to Messrs. Taylor, Taylor, & Hobson's advertisement in your Correspondence columns, which are usually filled with subject-matter of greater interest than the conduct of any special branch of an industry. I feel strongly, however, that an *industry* is unfairly attacked by this method of advertisement.

Messrs. Taylor, Taylor, & Hobson have not in the past been loth to make capital out of "leading makers'" good work by designating their own lenses by the same nomenclature—"Rapid Rectilinear," "Wide-angle Rectilinear," &c., appearing right through their catalogue! This originators can afford to pass by as another example of the truism connecting imitation and flattery. But, Sir, when this, at any time, inglorious method of *trading* assumes the gravity of insidious advertisement, calculated to injure an industry and mislead the unscientific public, I venture to think that a strong protest should be entered.

I do not propose to criticise Mr. Dennis Taylor's lens, as I have consistently refrained from commenting upon the work of my contemporaries for reasons that are obvious; at the same time I wish to dissociate entirely, in this protest, the *inventor* from the *manufacturers and their method of advertisement.* At *scientific meetings* an inventor may be justly entitled to compare the performance of an improvement in lenses with any previous effort in a *thorough* and *exhaustive* manner. Etiquette usually prompts him to make comparison with his own efforts when a manufacturer, and, if reference is made to other constructions, it is on the understanding that the other side have full "leave to defend." The etiquette referred to has been upheld by Messrs. Ross in introducing their "Concentric" lens, and Messrs. Goerz the "Double Anastigmat." But—to the misleading nature of Messrs. Taylor, Taylor, & Hobson's

advertisement itself: The comparative illustrations in no complete or honest sense convey the comparative merits of the two instruments.

Let the public be warned that the publication of *one set of conditions* in the comparison of two lenses is unwarrantably unfair, and that *for the purposes of such advertisement* a true diagram could readily be constructed making an inferior instrument appear vastly better than a much more perfect one, and *vice versâ*, according to the set of conditions chosen!

"Good wine needs no (such) bush" as Mr. William Taylor sends it off with. While he confines himself to "home-made" sworn affidavits, I, of course, have no wish to interfere, and the expert and the public may judge for themselves; but, when such unfair comparisons appear in an influential paper, I decidedly protest in the cause of a calling to which I have hitherto been proud to belong.—I am, yours, &c.,

THOMAS R. DALLMEYER.

25, *Newman-street, Oxford-street, W., October* 21, 1895.

EXPOSURE.

To the EDITOR.

SIR,—Mr. R. G. West treats of the influence of distance on exposure in a sound manner; but he infers that he is the first to do so, and that all the exposure formulæ and methods "have fallen into error in the matter." The following extract from my *Elements of Photographic Exposures* shows that this is not the case. It was first published in 1890, and some thousands have since gone out with exposure meters, and in three editions of the pocket *Exposure Notes*:—

"THE DISTANCE OF SUBJECT FROM LENS.

"This is a point much misunderstood even by experienced photographers.

"It may be taken as a general rule that, except when photographing near objects (less than twenty-four times the focus of the lens distant), or, on the other hand, extreme distance in landscape, no variation need be made for differences in distance.

"When a very near object is photographed, the camera has to be racked out, and the exposure increases in proportion to the square of the increased focus of the lens. When the subject is more than twenty-four times the focus of the lens distant (eighteen feet for a nine-inch lens), this variation is too minute to be taken into account, and if the air were perfectly clear—as it is sometimes among the Swiss peaks—all objects beyond that distance would require the same exposure. In England, however, the slight fog or mist almost always present in the air adds reflected light to the image of objects more than one or two hundred yards distant, and thus decreases the exposure (it is impossible to express this by rule, as it depends entirely upon the *amount* of mist in the air); this shorter exposure cannot often be taken advantage of, as pointed out previously."

I gave the same information in other words in my paper, *The Mathematical Calculation of Exposures*, published in this JOURNAL of April 25, 1890.

Mr. Howard Farmer's table is a rough approximation, which considers illumination as well as distance. The real reason why a longer exposure is given when the nearest important shadow is ten feet distant than when 100 feet distant is that, in the first case, the shadow detail is so large and important that it must be exposed for, whereas, in the second case, the shadows are so unimportant, that they may be ignored and a shorter exposure given for the sunlit part; but the table has done a good deal of harm by encouraging the idea that exposure varies with distance in some fixed ratio.—I am, yours, &c., ALFRED WATKINS.

ART AND PHOTOGRAPHY.

To the EDITOR.

SIR,—In all the discussion that has lately taken place on the question of Photography and Art, both in the photographic journals and the public press, one point of great interest to photographers, and all interested in the commercial success of photography has been overlooked.

Whether the members of the Photographic Salon have proved their claim to be considered artists is a matter which may be of great interest to them individually, but that which is of far more importance to the photographic world generally is the fact, that they have educated the public into believing that a photograph may be really worth something more than the price of a frame. When we find that photographs in the Salon are not only advertised in the catalogue to be sold at £5, but actually find purchasers at that price, we realise what a boon the Salon has been to photographers, and indirectly to the photographic trade.

It is but a short time ago that a few shillings seemed a high price for a photograph, and to have asked such prices as the exhibitors at the Salon not only ask but obtain would have seemed an absurdity. But, thanks to the education which the public have received in the appreciation of photographic pictures, it seems not unreasonable to hope that we may see even higher prices obtained in the near future. And a nocturne by Mr. M—— may find a buyer at five-and-twenty pounds (though I believe guineas are more artistic).

The mere possibility of such a thing is enough to encourage every aspirant to photographic fame to attain even a higher level than has yet been dreamt of even by the most sanguine Salonist.—I am, yours, &c.,

ERNEST J. HUMPHERY.

"COSMOS" AND THE *DAILY CHRONICLE* CRITIC.

To the EDITOR.

SIR,—In relation to the critiques reprinted in this JOURNAL from the *Daily Chronicle* about the Photographic Exhibition, "Cosmos" writes: "I do not agree, and I am sure nobody agrees or sympathises with the cheap display of savagery in which he indulges at the expense of photography."

I should like to say, that I do not find any display of savagery in the article mentioned; that I see only the truth in it, and that many friends and acquaintances of mine are of the same opinion.—I am, yours, &c.,

F. B.

PEARSON'S WEEKLY AND PROFESSIONAL PHOTOGRAPHY.

To the EDITOR.

SIR,—It is most gratifying to professional photographers to see Mr. Newman taking up the cudgels to wage war against the unwarrantable interference with their interests *re* Pearson's free-portrait business. All right-minded photographers must see that this kind of thing casts the gravest reflection upon the profession. According to *Pearson's* the public have no occasion whatever to pay more than 5*s.* for the best-finished enlargement—an enormous inaccuracy, as every photographer well knows, and, as he also knows, the tendency this kind of thing has of injuring a legitimate business. It is deplorable that Mr. Pearson cannot devise some other means of creating a circulation for his papers. As a reader of Pearson's publications, I had always entertained an impression that Mr. Pearson was a fair man; but surely he must see that he has not used his usual discretion in this instance. I trust that Mr. Pearson will soon see his error, as I also hope the photographic papers will make an effort to look after the interests of professional photographers.—I am, yours, &c., F. R. GALE.

Wrexham, October 16, 1895.

CHELTENHAM PHOTOGRAPHIC EXHIBITION.

To the EDITOR.

SIR,—I shall be much obliged if you will allow me to state in your columns that this Exhibition has been postponed till the first week in March next, with a view to conducting it on a more extensive scale than could be done at this season of the year. The opportunity of making some changes in the classes has been taken advantage of, and I shall be glad to send revised classes and entry form to any one interested. With thanks.—I am, yours, &c., PHILIP THOMAS,

Cheltenham, October 21, 1895. *Hon. Secretary*

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange a 5×4 folding Kodak for 10×8 rapid rectilinear lens by a good maker.—Address, R. GUNN, 117, Blythswood-drive, Glasgow.

Wanted, a short-focus cabinet portait lens in exchange for a double-cylinder burnisher, atmospheric gas-heating, silver plated.—Address, M. MEYERS, Court Studio, Enfield, Middlesex.

Wanted, 15×12 camera and slide, in exchange for first-class camera, one double and single slide, square, and fine cabinet lens; cash also if necessary.—Address, REGINALD W. BROWN, Photographer, Old Boulevard Studio, Weston-super-Mare.

Will exchange Burr's 12×16 rapid doublet, whole-plate portrait, by Shepherd, Dallmeyer's 5×4 portrait, half-plate camera, the latest portable dark room, for a good hand camera or enlarging set or Thornton's shutter.—Address, C. BANYARD, Photographer, Melton-hill, Woodbridge, Suffolk.

Will exchange a whole-plate, bellows camera (conical), two dark slides, and automatic changing box, holding twelve dry plates (all in excellent condition), for a half-plate, rapid rectilinear lens, quick acting for portraits indoors.—Address, W. S. PARRY, 74, Corporation-road, Middlesbrough.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

John Thomas Barker, 71, High-street, Stourbridge.—*View of Exterior of Cookley Church, near Kidderminster; View of Cookley Village, near Kidderminster, showing Wesleyan Chapel; View of Wolverley Village, near Kidderminster.*

PRINTER.—We never heard of "sansotype."

BLACK AND WHITE.—There is no work on the subject now in print.

JONAH says: "Would you give me the address of the Glacier Window Decoration Company?"—In reply: McCaw, Stevenson, & Co., Cannon-street, E.C.

RUDDER GRANGE.—It is impossible for us, for obvious reasons, to insert the letter as it stands. Tone it down a little, and we will insert, as our sympathies are entirely on the side of the professionals.

RALPH.—Both iodide and bromide of silver may be procured from any of the operative chemists in the dry state if you think that will answer the purpose better than that you make yourself. We think that is doubtful.

FRED. HULSE.—The best way would be to get some thoroughly practical worker to give you instructions, or to article yourself to some firm who are working the processes. Failing that, get Burton's and Wilkinson's books on the different printing processes.

LT. H. DU CANE STUART says: "Can you please refer me to the back number of THE BRITISH JOURNAL OF PHOTOGRAPHY in which appeared an article on printing in collodion papers, as I wish to send for it?"—In reply: See Mr. Maclean's article in the JOURNAL for June 21 on *Collodio-chloride Printing.*

A. D. A.—Parchment paper may be obtained of any of the large stationers, but you will, of course, have to coat it with gelatine for yourself. We know of no one who supplies it ready coated, except those who supply the apparatus. Of course the coated paper is considerably more costly than the raw material.

J. CRAWFORD.—We do not remember the article, and, unless you can give us more definite information, we are afraid we cannot assist you. All bromide films, developed with pyrogallic acid, partake more or less of the character of bichromate films after exposure to light. We know of no successful method of reticulating the film without the aid of heat.

ARTIST writes: "Could you or any of your many readers tell me where I can get 'spottum,' or the receipt for making it? It was manufactured some time since by Messrs. Laurence & Co. I have tried many advertised solutions and methods, but none of them come anywhere near 'Spottum'—it will stand burnishing or enamelling without moving in the least."

EXCELSIOR writes: "Will you do me the favour of inserting in the next issue of your JOURNAL an answer to the query, What is the best and most approved method for obtaining softness in a photograph?"—This is a very vague query. If our correspondent means softness in a negative, then let him give a full exposure, and not carry the development too far.

S. W. W.—Twenty-four hours' soaking in water, with the view of thoroughly eliminating the hyposulphites, is likely to do more harm than good as regards the permanency of the pictures. The hyposulphites can as well be got rid of in a couple of hours as they can be in twenty-four hours, provided, of course, the prints are properly attended to during the time.

A. C. R.—We can give no idea as to where you have failed, as no mention is made of the character of the gelatine employed. In all the mechanical processes in which gelatine is employed the gelatine is an important factor in the case. This is too often overlooked by beginners, who treat gelatine as being a constant thing, whereas no two brands are alike, and often different batches of the same brand vary considerably in their character.

W. E.—The best position for the supplementary lenses is in the centre of the combination, although they may be placed either at the front or the back. For lengthening the focus concave glasses will be required, and for shortening it convex ones. If you go to any practical optician, and tell him what you require, he will supply what is necessary. Spectacle glasses may be used, and they are very inexpensive, and may be had of any focus, if you can fit them yourself.

BECCLES.—Under-exposure is the cause of the trouble. Such rapid exposures as the one-hundredth of a second must not be attempted with *f*-22, on such subjects as shown in the prints, at this time of the year, even with the most rapid plates. If any more of such subjects be attempted at this season, the aperture must be much increased, and the shutter slowed to a tenth or more. By the way, that speed would have been quite quick enough for the majority of the subjects depicted.

A. LAWSON.—We scarcely understand the query, we are afraid. So far as we can make it out, you have a long, narrow subject on the negative, and you wish to make a lantern slide from it which, while including the whole of the subject lengthwise, will be much higher, so as to fill out the slide in height. If that be the object, we know of no way of accomplishing it, except by extending the subject by hand work, and then reproducing it. Better write again if this is not the object in view.

S. SAGE.—The best developer for lantern plates will very much depend upon the plates themselves and the colour desired. The developer that may be the best for a certain colour, for one make of plate, will not, necessarily, be the best with another. You cannot do better than use the formula supplied with the different brands of plates. You may take it that the makers of plates, as a rule, know what developer suits them the best. However, with the present makes of plates there is a great latitude as to the developers that may be employed with them.

H. O.—There is very little question that the mountant is the cause of the rapid fading, seeing that, where dabs of the paste have been put on the back of the prints, those portions alone have faded in less than a fortnight. Probably the paste contains bichloride of mercury as an antiseptic, and that would act injuriously on a silver print. Your idea of obtaining recompense from the makers of the cement for the faded prints is simply ridiculous. It was sold as an office gum or general cement, for which it is, no doubt, well adapted, and not as a photographic mountant. If it were, the case might be different.

C. ROWE.—If you can have a thirty-feet length on the side of the high wall that faces the north, by all means select that site, and have the studio fourteen or fifteen feet wide. As to the roof, that may be of the ridge form, with the side next the wall slate, zinc, or galvanized iron; or from the ridge to the wall may be a flat roof, with sufficient slope to carry off the water. With that length six feet of the roof at either end may be opaque, and four feet six at the sides. You will rarely, if ever, be troubled with the sun in this studio, as the height of the building, except perhaps about midsummer, will completely shut it out during business hours.

DOUBT says: "I shall be thankful if you could reply to the following:—I have to photograph a church, which is in too close proximity to several other buildings to obtain the entire length of it in one negative, so shall be obliged to photograph it in sections (three, I expect). I should feel very grateful if you would oblige me with instructions, as I have tried the same experiment before without success, owing to not being able to get the lines in their exact positions. Which would be the most suitable lens to employ, wide-angle or rectilinear?"—If the building has to be taken in sections, the only thing to be observed is to take care that the camera is perfectly level, and that its position is not altered, except by rotating it on the stand. The church must be in very close quarters indeed if a modern wide-angle lens will not include it in one negative. Whether a wide-angle or a narrow-angle lens be employed, it must be one giving straight lines at the margins.

J. S. says: "I am at present in a situation in the east end of London, doing cheap work, where I am expected to tone forty-six sheets of paper with one tube of gold. Is it possible? If it is, what would be the result as to colour? Would the print be permanent? I herewith enclose a print which my employer calls a nice purple, but I ventured to suggest that it was decidedly red, in fact, not toned or any way near it, upon which he immediately accused me of not being up to my business, and also that I must be colour-blind."—We are unable to say how forty-six sheets of paper are to be toned to a rich purple with one tube of chloride of gold, that is, supposing it is the ordinary fifteen-grain tube. The print enclosed is not a purple, but a warm brown. As regards permanency, if that depends upon the deposit of gold, much must not be expected. We might add that, with such negatives as the print was produced from, for the credit of photography, permanency is not a thing to be desired.

*** Several answers to correspondents unavoidably held over.

CONTENTS.

	Page
PROCESSES FOR LANTERN-SLIDE MAKING	673
DEFECTIVE SKIES	674
JOTTINGS. By COSMOS	676
CONTROLLING OVER-EXPOSURE AND OBTAINING DENSITY IN DEVELOPMENT. By W. E. DEBENHAM	677
ENLARGEMENT. By E. H. MICKLEWOOD	678
SOME IDLE THOUGHTS ON PHOTOGRAPHIC SOCIETIES. By WALTER D. WELFORD	679
THE HELIOGABLOTYPE By J. FOCUS SNAPPSCHOTTE	680
THE OFFICIAL PHOTOGRAPHIC COMPANY OF THE COTTON STATES EXPOSITION	681
OUR EDITORIAL TABLE	682
NEWS AND NOTES	682
RECENT PATENTS	682
MEETINGS OF SOCIETIES	683
FORTHCOMING EXHIBITIONS	686
CORRESPONDENCE	686
EXCHANGE COLUMN	687
ANSWERS TO CORRESPONDENTS	688

THE BRITISH
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PHOTOGRAPHIC PERSPECTIVE AND THE CRITICS.

A celebrated wit once said, with regard to literary criticism, that it was better not to read the book to be reviewed, as then he could write about it without prejudice. This is only a partial parallel to the work done by recent newspaper critics in regard to photography, for, though they were as ignorant of the subject their literary gyrations were concerned with as was this wit with his books, they wrote with an amount of prejudice and bias that is difficult to conceive. More particularly are their opinions discredited when they touched upon the errors of "photographic perspective." They followed in the path of other ignorant writers on art topics, who, entirely ignorant of the powers of photography, are all the more virulent in the manner they inveigh against it on the ground of its false perspective. Possibly they have been led astray by some of the absurdities that have recently been put upon view, and have, in consequence, felt justified in impugning the knowledge and truthfulness of form exhibited by the majority of works shown. But over two hundred years ago Cornelius Ketel painted portraits with his fingers only as tools; but that was one more reason for ridiculing all oil paintings, however produced, than is the production of Ketel photographs for derogating from the beauty and truth of companion photographs. The real truth is, that a photograph taken with a lens of rectilinear type gives an image precisely accordant with that linear representation which is taught, on mathematical principles, by art teachers of recognised ability, that is, the same representations, line for line, that would be given by tracing on a sheet of glass the outlines of objects lying beyond it, the condition being implied that the draughtsman was endowed for the nonce with Polyphemus-like ocular arrangements, and that he looked "straight" at the sheet of glass. Hence, to object to such representations as being incorrect is simply a confession of ignorance of perspective on the part of the critic, though sometimes it may be want of judgment is shown by the producer of a photograph. Artists of the brush, however, are equally given to cavilling at perspective monstrosities shown by their craft brethren. Let a full-length sitting of a man be painted and shown, and at once there will be heard comments on the disproportion of the lower limbs; they will certainly be objected to as bad in perspective, or, what amounts to the same thing, foreshortening, unless the artist belong to the critic's clique. Artists, we know, belong to localities, and the work of an outsider is to the clique of one neighbourhood *anathema maranatha*.

It thus becomes evident that little value attaches to these newspaper reviews, and, though nowadays we do not use quite the strength of language of Bishop Warburton, who, a little more than a hundred years ago, wrote of the "worthless crew professing vertu and connoisseurship," we feel inclined to say the same thing in different language.

We have just referred to possible want of judgment on the photographer's part. Many things that are perfectly legal in social life are decidedly inadvisable, and so in photography many representations may be strictly correct, but decidedly inadvisable, for it is possible that they may look incorrect, although this apparent untruth vanishes when the picture is viewed from a particular standpoint. A painter rarely includes an angle of view including sixty degrees, simply because his picture is not likely to be viewed from the correct point, and his representation would in consequence probably be jeered at. A painter, again, never paints, at any rate in correct perspective, such a subject, for example, as a horse with the fore quarters decidedly larger than the hind when the animal was shown as viewed askew. In fact, he would choose to paint such a representation as would be given by a photograph when the object was forty or fifty feet away. His view would not be correct, but it would be in keeping with tradition. Hence our readers who wish to avoid giving a handle to those whom Professor Poynter, in art matters, calls the "newspaper ignoramus," will avoid wide angles and the photographing objects of material proportions from too close a standpoint. But even then we shall, no doubt, continue to read of "distortions," "impossible representation," "photographic perspective," and the similar stock in trade of those people referred to. The great artist, Ingres, wrote of them as "les gens qui nous pigent, qui nous insultent. . . . . Sans avoir rien appris, rien, ou impudents et ignorants."

Of course, all this criticism is, as most photographers are aware, an old story. We have referred to a note we made in 1873, from one of Gilbert Hamerton's works, and we find him writing: "It is false in perspective, and consequently in the proportions of forms." We cannot but think that the chorus of cheap criticism, which has been lavished upon photography quite lately, has been caused by the success it is achieving, and, in conclusion, we may quote, as something soothing to have in mind when our would-be tormentors are plying their vocation, Michael Angelo's well-known remark that oil-painting is "proper only for women or idle persons like Fra Sebastiano!"

THE DESTRUCTION OF THE INVISIBLE PHOTOGRAPHIC IMAGE.

In the course of an article two or three weeks ago we alluded to the necessity, in intensifying a negative produced by the "reversal" process, of treating the film, before applying the pyro and silver intensifier, with bichromate of potash, in order to prevent the recurrence of the image removed in the first stage of reversal. At the last reported meeting of the London and Provincial Photographic Association the question was raised as to the possibility of getting rid of an image once developed, so that it could not be reproduced, and, as no definite conclusion appears to have been arrived at, we venture to offer a few remarks on the subject.

The question is by no means a new one, and presents certain anomalies that, so far as we are aware, have never previously been explained; and we may at once express the opinion that, while an image so removed can undoubtedly be redeveloped over and over again, it is equally certain that its recurrence can be prevented. We will go further, and put the matter in a somewhat paradoxical light, by stating that, although by the removal of the first image the effect of light upon the film is entirely destroyed, yet still a developable image remains.

The subject presents itself in various phases according to the circumstances under which the operations are performed. About thirty years ago Carey Lea investigated the question and fully demonstrated the curious fact that we have alluded to. His experiments were made upon wet-collodion plates and, the solvent used upon the image was a solution of mercuric nitrate. It may be remarked incidentally that all the experiments we are acquainted with have been made upon collodion plates, the physical character of gelatine, no doubt, being against the use of such films.

In the case of a wet-collodion plate developed with either iron or pyro the image is, of course, formed on the surface of the collodion film, and is composed of metallic silver deposited from the developer. When this image is removed before fixing by means of nitrate of mercury or other solvent, the film is restored apparently to the original condition it presented before development, that is to say, it contains the same quantity of iodide and bromide of silver that it did on issuing from the bath. Under such circumstances it does not require any violent stretch of the imagination to believe, as was supposed, that the particles of sensitive salt, being still in a state of "molecular vibration" from the influence of light, remained still capable of producing a visible image on the reapplication of the developer.

But, if after development the plate be fixed, and after well washing the image be removed in the same manner, the film presents the appearance of clear glass, the whole of the sensitive material having been removed as well as the image; yet, on the application of the developing solution, the original image is restored in more or less of its former perfection. The case now assumes an entirely different aspect, for in the absence of any sensitive silver haloid to form the nucleus of a new image we are apparently forced to the conclusion that the influence of light extends to the collodion film, or that the condition of molecular excitement is imparted to the insensitive organic body as well as to the silver salt. This appears an the face of it absurd, yet the fact of the developable image remains.

Let us now turn to another phase. If, instead of applying a developer of the "physical" kind—that is, one of acid pyro or iron and silver—for the restoration of the image, we use alkaline pyro, no such resurrection of the removed picture will occur, and, though the action may be continued until considerable reduction of the haloids occurs over the whole surface of the plate, so far as our experience goes, it is impossible to detect the slightest sign of any redevelopment.

We will go a step further to another side of the question. About twenty years ago Captain Abney published the fact that certain oxidising agents, including nitric acid, potassium bichromate, and potassium permanganate, if applied to an exposed film before development, destroyed all action of light and prevented the development of an image. Although, speaking from memory, Captain Abney's experiment related to films of bromide of silver and alkaline development, the effect that he recorded applies equally to other kinds of film and to "physical" development; that is to say, if diluted nitric acid or mercuric nitrate—in which the active agent is the loose atom of nitric acid—be applied to an exposed film before development, the effect of light is entirely destroyed; whereas, if applied after development, the effect of light remains, clearly an impossibility, for, though some influence may remain, it is not that of light.

This difference in the behaviour of the two kinds of developer affords a clue to the mystery, which those who are familiar with their individual peculiarities will not be slow in following up; but especially will old wet-plate workers be quick to recognise that the second and successive developments are due to purely *chemical* causes, and not directly to the action of light at all. The original image *was* produced by the action of light followed by development, but by its removal all influence of light is eliminated from the film, and what remains is, as has been said, purely chemical.

In order to explain this, we need only refer to the ready manner in which stains and irregular markings are produced by any form of silver development or intensification, and to their comparative absence, or we may say, with regard to surface stains and markings of the kind we mean, their *total* absence, in the case of alkaline pyro or other form of chemical development. The earlier workers with dry plates—collodion dry plates—will be in an even better position to recognise this difference, for they will remember how frequently a plate, that had successfully passed the development stage with pyro and alkali, would be ruined in intensification from the formation of stains that, from their character, were evidently due to an imperfectly clean plate. In this matter chemical development entirely ignores slight surface impurities of the glass that would be brought into full prominence by either iron or pyro and silver.

The physical developer, in fact, is a solution in such a delicate condition of equilibrium that it requires very little to upset its balance, and when that occurs the silver it contains must deposit or attach itself to something; and if there should be any chemical or even physical attraction to influence it, such as a smear on an imperfectly polished plate, down it will go on that. Take an apparently clean but unpolished glass plate, and apply a developer of pyro or iron and silver to it, and in a short time every invisible smear and marking on its surface will be as clearly defined as if photographed; but it is not by the action of light. Under similar circumstances no such result would be produced by alkaline pyro, for the simple reason it has no silver to deposit, hence the difference between the two in the experiments with removed images.

Our readers will, we think, by this time have recognised our line of argument, namely, that the redevelopment of the dis-

solved image is due, not to any remaining influence of light, but to the same causes that produce stains on a dirty plate—chemical action. In the process of removing the original image, the portions of the film, where it exists, are subjected to the action of the dissolved silver and are probably not thoroughly freed from traces of it, with the result that they form the nuclei round which the reduced silver is deposited when the second development takes place. The action spreads, no doubt, more or less to surrounding portions, for we are not going to assert that the second image is as perfect as the original, and we know that it gets worse, *i.e.*, dirtier and less distinct after each repetition; but the strongest action takes place when the chemical effect is most concentrated, namely, where the original image existed.

Having exploded the idea of the influence of light in the formation of restored images, let us turn to the possibility of the prevention of their recurrence. In the article to which we referred in the opening sentence of the present one, we recommended for this purpose bichromate of potash. Now, this salt is one of the oxidising agents mentioned by Captain Abney as destroying the invisible image or the light's action, and, in applying this for the purpose of counteracting an effect that we have just shown is not due to light, we may appear to be acting in a somewhat irrational manner; but, in so applying it, its action is simply detergent, if we may use the term, it acts merely as a cleanser, and to destroy the chemical effect of the removed silver upon the collodion film. Nitric acid applied in the same manner, although equally effective in destroying the latent image, will not prevent its redevelopment, simply because, being a solvent of silver, it practically forms a solution of silver nitrate with any traces of metal that may remain, and the effect of a soluble silver salt is still left behind. The bichromate, however, acts in this case in the same way as when employed to remove fog from emulsion—chemical fog we speak of, not light fog—with the aid of the chlorides in the water, or, more rapidly still, if a soluble chloride or bromide be used with it, it converts any soluble silver into chloride or bromide which only becomes amenable to development upon exposure to light.

That bichromate of potash, preferably in conjunction with soluble bromide, will not only destroy the invisible image before development, but prevent its recurrence after removal, we have not the least doubt, having very frequently employed it for both purposes, notably in the manner referred to two or three weeks back, in order to render silver intensification possible with a reversed image. But that it fails sometimes we are well aware, having at one time been considerably puzzled by its vagaries until we traced the cause. This is the exposure of the plate to light before intensification, and while the shadows contain traces of sensitive material.

Follow a plate through the process of reversal. When the image has been removed, there remains, even after redevelopment, the chemical effect of the removal of the silver; for, even supposing all *soluble* silver to have been reduced by the alkaline developer, it is in the same condition to attract the silver from the intensifier as is the silver reduced from the film, and in fact does so. If, before intensification, bichromate be used, the soluble silver is converted into chloride or bromide, whichever of the latter salts be present, and, that being the case, the shadows of the negative are sensitive to light, and, if exposed to a strong light, the intensifier throws down a deposit upon the newly exposed bromide or chloride, as well as upon the rest of the plate. But, in using the bichromate after redevelopment, the power of intensification is greatly diminished; it should therefore be applied previously, when the slight and probably invisible layer of sensitive salt formed in the shadows will be insufficient to cause any appreciable difference under chemical development, though with physical its effect, unless restrained by the bichromate, would be fatal.

A Developing Competition.—Mr. Alfred Watkins has instituted a developing competition, to be conducted under the auspices of the Photographic Club, who have appointed Mr. F. A. Bridge and Mr. J. B. B. Wellington as Judges. The competition, shortly explained, is for the development of negatives which, cut in two and developed separately, show the greatest contrast in printing gradation between the halves, the conditions named being adhered to. These conditions, with full particulars, may be obtained from Mr. Watkins, Imperial Mills, Hereford, or Mr. Sinclair, Secretary of the Photographic Club, 26, Charing Cross-road, W.C. Prizes are to be awarded, and a most interesting and instructive competition will, no doubt, result.

The Falls of Foyer.—Two or three weeks ago we alluded to the destruction, or mutilation, of this picturesque spot by the British Aluminium Company for works. According to a lay contemporary, no less than thirty-two petitions against the vandalism have been sent to the Inverness County Council. It is a significant fact, however, that out of that number no less than twenty-nine were sent from England, and only three from Scotland—namely, two from Glasgow, one from Aberdeenshire. From this it would seem that distant Southeners are far more interested in the future of the falls than are those located northwards, and who might be expected to take the most interest in the matter. Evidently the Inverness County Council—if they have any option in the matter—attach more importance to the commercial interests of the locality than they do to the æsthetic ideas of the residents in remote districts. Be that as it may, a happy hunting ground for photographic tourists and artists seems to be doomed.

Photography at the North Pole.—The Jackson-Harmsworth expedition to the Pole has, so far, been as much a success as the Peary one was a failure. This expedition, it will be remembered, started in the *Windward* in July, 1894, and its object was a scientific one rather than anything else. Photography was to play a very important part in the expedition. At the time it started we mentioned that our scientific readers would be interested to learn how gelatine dry plates would behave after a prolonged exposure to extreme cold. The *Windward* has now returned to the Thames, leaving Mr. Jackson and his party behind, and will next June start back to rejoin them with further stores. No details of the expedition have yet been published; these, it is stated, are reserved for a paper that is shortly to be given before the Geographical Society. However, it is mentioned that some most interesting photographs have been sent home in the *Windward*, and it is in these, and how they were obtained under such abnormal conditions, that the majority of our readers are the most interested.

Lenses.—Of new and improved photographic lenses, thanks to the Jena glass, we surely now have plenty, though, to judge from a large proportion of the work shown in the Exhibitions now open, even moderately good lenses are an evil rather than otherwise. While foreign opticians have been steadily increasing the number of elements in their instruments, the English ones have been reducing the number in theirs. The former, commencing with four, as in the well-known rectilinear form, have increased them to five, six, eight, and lastly, by an American firm, to no less than ten. In England, Mr. Dennis Taylor, with his new lens, has been content with four glasses, and at the last meeting of the Royal Photographic Society Mr. Dallmeyer described his last new lens, which has only two

This instrument is constructed specially to meet the requirements of the new cult of photography. With all our new lenses it would be difficult to produce anything with them, whether with microscopical definition or of the fuzzytype order, that was not equalled by the lenses of thirty years ago, though perhaps under more strained conditions. Still they were produced.

A Warning.—Seagulls have thus early made their appearance as far up the river as Westminster Bridge. This, according to some weather-wise prophets, presages a long and hard winter. On the other hand, from observations made during the past few months, some meteorologists predict an exceptionally mild one. Time will show who are right. The serious inconvenience that many photographers suffered last winter, through frozen water supplies, has doubtless passed from their minds, and no means have been taken for their avoidance in the future. The present "cold snap" should be taken as a warning that all the troubles that were experienced last winter may be repeated this. In a majority of instances the trouble was not so much with the pipes within the house as to the service pipe from the main to the building being frozen, through its being laid too near the surface of the ground. It would, perhaps, be interesting to know how many of those who were put to the greatest trouble have had their supply pipe laid lower in the ground to avoid a repetition of it in future. Already we have heard of instances of temporarily frozen pipes in very exposed dark rooms; hence this note of warning.

Photography and Art.—During the last fortnight of the silly season, the *Standard* has been supplied with a "big gooseberry" in the shape of a number of letters as to whether photography is an art. In that correspondence, the advocates in the negative have had it pretty much their own way, and the same seems to have been the case at the Camera Club, when Mr. G. A. Storey, A.R.A., read a paper on the subject. In this paper photography is praised as a science, and its beautiful results commended, &c., and occasion was taken to contrast it with wood and steel engraving, which the author considered much superior to it. But why all this sudden outcry by painters about photography and art? Is it by reason of the works shown in the two Exhibitions now open? is it because it has exposed so many errors in painters' work? or does it arise from the subject we alluded to a fortnight ago, namely, the opinions of a number of artists on the question, a new Copyright Act, expressed in a late number of the *Magazine of Art*, some of whom would make a distinction—as regards copyright—between engravings from original pictures and photographs from them? If a new Copyright Act is looming in the near future, photographers should be on the alert. What says the photographic section of the London Chamber of Commerce?

Advance of Carbon Printing amongst Amateurs.—There is no question that the carbon process is rapidly gaining favour in the ranks of amateurs. At the last meeting of the Darwen and Bradford Societies practical demonstrations of the working of the process were given—as at several other societies of late—by gentlemen who are not commercially interested in the supply of materials. In one of the lectures it was mentioned that in the Pall Mall Exhibition in 1893 there were but forty-eight exhibits, while this year there are 120. It was also mentioned that in the early seventies it was highly popular, and then it suffered an apparent death, and now was experiencing a sure, though slow, revival That is correct, but at the time referred to the popularity was chiefly confined to professional photographers, but it did not last long. Its resuscitation, we surmise, has been largely due to workers being enabled to purchase small quantities of the tissue ready-sensitised, the sensitising of it being considered, by many, the bugbear of the process. By the way, a correspondent in a recent issue of the *Glasgow Evening News* points out that the number of items to be found in price-lists, as necessary in carbon printing, can well be done without. That is the case, and it is the supposed necessity for them that has deterred many amateurs from taking up the carbon process.

A NOTE ON ANTI-HALATION PADS.

The latest novelty, commercially at least, in connexion with dry plates is the so-called anti-halation pad, which is intended to replace the always more or less objectionable plan of coating the back of the plate with some kind of non-actinic preparation to absorb the rays of light that pass through the film. In the old days of collodion dry plates the films were so extremely transparent that this was almost an absolute necessity for even ordinary landscape work, and, when interiors or similarly trying subjects were in question, the remedy was at best but a partial one. The ordinarily careful worker of that period would as soon have thought of going out with unbacked plates as with no plates at all, owing to the difficulty in rendering objects clearly when cut against the sky.

The operation of backing the plates then formed an essential portion of the process of preparation, the material used being generally a paste consisting of annatto or burnt sienna in conjunction with gum, starch, or other substance, to bind it to the glass when dry; but, even when efficient for the remedial purpose intended, such preparations were always a nuisance, first in application and afterwards in use, for, unless most carefully compounded with a proper proportion of binding and hygroscopic material, the backing proved a prolific source of dust spots, and many have been the otherwise good negatives utterly ruined from this cause. With burnt sienna, too, there was always a tendency, if it became too dry, to attach itself so firmly to the glass that it was nearly impossible to remove it, even by scraping it, and I have often seen negatives rendered useless from this fault.

To remedy the evils arising from the ordinary methods of backing, the present system of pad was suggested in The British Journal of Photography, I should say, nearly twenty years ago; at any rate, I know I adopted it on the occasion of a trip in North Wales in the summer of either 1876 or 1877, when, owing to lack of time before leaving home, I was unable to prepare the usual stock of dry plates. Several dozen partially cleaned glasses, a stock of washed collodion emulsion, and a dozen or more backing pads, together with the usual developing solutions, formed a portion of my travelling paraphernalia, and I refilled my slides each evening with fresh plates coated in my bedroom. It was rather trying work, but I had no reason to find fault with the results.

The backing pads consisted of pieces of unsensitised carbon tissue prepared for use by impregnating them with a mixture of glycerine and molasses, or with glycerine alone, and, when properly done, this forms as perfect a preventive of halation by reflection as can be obtained, for I question whether any means of this kind can prove a perfect remedy. The utility of the method of course depends upon the preparation of the tissue in such a manner that it can be made to adhere to the backing of the glass in optical, and not merely mechanical, contact, for under the latter circumstances the application is not only no remedy, but I firmly believe magnifies the defect, and this brings me to the subject of my "note."

A few days ago I was called at short notice to take a photograph of the interior of a church while decorated for the "harvest festival," and as I wished to do it as well as possible, I improvised, out of materials at hand, some anti-halation pads. Time was short, so a few pieces of carbon tissue cut a trifle smaller than the plates were soaked in a mixture of glycerine and water until they became sufficiently limp for the purpose. Naturally, it might be supposed that I should say "quite limp," but, until the experiment has been tried, it would scarcely be believed with what reluctance the glycerine permeates the gelatine film; in fact, if pure glycerine be applied to carbon tissue that has been kept under ordinary atmospheric conditions, it will cause it to curl more tightly by extracting what little moisture it contains.

At any rate, in my case the tissue was not soaked sufficiently to remove all the "curl," but enough to enable it to be squeegeed into contact with the glass, where it adhered perfectly, and with great tenacity. A plate was exposed on the church interior with, of course, the altar and east window, forming the centre of the picture. The window is perfectly plain and filled with faintly tinted glass, the only variety being in slightly darker shades of colour in some of the squares. The exposure, as it happened, was far too long, in consequence of my using an "extra rapid" instead of what I sup-

posed to be an "ordinary" plate, probably three times as long as it ought to have been.

On development, the window showed a number of irregular transparent spots of various sizes, which at first I took to be imperfections or abrasions of the film; but careful examination after fixing proved this not to be the case, and the phenomenon puzzled me very considerably. If the window had been taken from the outside instead of the reverse, the effect was just that of a large number of the panes having been broken, but from the inside the irregular black patches —in the print—were altogether inexplicable. Examining the negative with a magnifier, I at last found that here and there, where one of the spots covered the black divisions between the panes, these, instead of being transparent as they ought to have been in the negative, were black, and also that, where the chains of the hanging lamps crossed the transparent spaces, they also were opaque, although where they were outlined against the rest of the window they were transparent.

Here was reversal of the image, but by what caused? Later on, experimenting with my pads on plain glass, I found that, owing to the thickness of the tissue, and its not having been rendered perfectly limp, it was extremely difficult to secure perfect optical contact. In applying it to a dry plate, the opacity of the film prevents this fact being observable, but on plain glass it is very apparent, as any carbon worker will be aware, the points of non-contact being shown by bright silvery spots and patches, while the rest of the surface is dead black. Here was the explanation. Taken in conjunction with the excessive exposure given in the first place, the light reflected from the back surface of the glass at the points of defective contact had sufficed to bring about reversal of the image, the black diamond-shaped panes being rendered transparent and the cross lines black. In the latter case, partly from over-exposure, but chiefly from the spreading action of development, the lines were considerably veiled, though "transparent" in contrast with the rest of the window; but the additional reflected light had converted the veil into a deposit as dense as, or denser than, that of the open glass.

It is not to be supposed that the imperfect contact of the tissue was only on that part of the plate occupied by the window; it was, no doubt, universal, but in the darker portions of the subject the reflected light was not sufficiently powerful to produce any reversing effect. At any rate, no trace of it can be found, except on the window. To put the matter to a practical test, a portion of a plate was backed in the manner indicated, the remainder left clear, and it was then exposed to the open sky for some seconds, or until I thought the unbacked half would be reversed. The backing was applied somewhat carelessly in order to favour the formation of reflecting points, and in this I succeeded admirably. On development, although the unbacked half was thinner than the other, it had not undergone complete reversal; yet, notwithstanding this, the backed portion was covered with the same kind of transparent spots as those already referred to, but in an intensified form, from the more careless way in which the backing had been applied. If any doubt had existed as to the cause, it was now entirely removed, for a large circular "blister," caused by contained air, visible on the back of the tissue before exposure, was fully reproduced as a transparent marking on the plate.

Now, as I have already said, my pads were prepared in a hurry, and were not in perfect condition for use; but this accident points to the possibility of similar ones occurring from carelessness in the use of the most perfect pads. A friend of mine, who has used some of the commercial ones with every satisfaction, tells me that they are so thin that it is possible to tell from the back where they are in perfect contact; but this, I think, must be incorrect, for absolute *smoothness* does not necessarily mean perfect *optical* contact, and I don't see what other evidence there can be *from the back*. Hence, in using these appliances, it is advisable to exercise every possible means of securing true contact.

It seems to me that, especially with a thick pad, this can only be attained by having the surface in a thoroughly moist condition when it is laid down, and this, of course, entails a considerable amount of care when manipulating dry plates in the dark room. But that the task is not impossible I have satisfied myself by experiments on plain glass, when the slightest speck of imperfect contact is visible.

Of course, a specially prepared gelatinous mixture, in which the hygroscopic matter is thoroughly and uniformly mixed, must be easier to apply than an imperfectly impregnated sheet of carbon tissue such as mine; but the tissue may be utilised in the most efficient manner if properly prepared. For this purpose it should be soaked several times in a mixture of glycerine and water, and exposed to the air between the immersions, for the water to evaporate. Each soaking then introduces more and more glycerine, until at last the tissue becomes perfectly limp and pliable. In addition to this, it should be squeegeed on to glass while the water is evaporating, in order to give it a perfectly even surface, as, if this be not done, the solution will run into lines, and cause unevenness from irregular absorption. When once rendered limp, it will remain so, and may be kept, when not in use, squeegeed to glass or thin-waxed tissue paper. Before use it will require drawing over the surface of a solution of glycerine in a dish in order to secure best contact.

W. B. Bolton.

SOME IDLE THOUGHTS ON PHOTOGRAPHIC SOCIETIES.*

Next in our panorama comes a modern creation, the "artist" or art photographer. He is chock full of art, and is therefore artful. In the abstract his efforts are good, they are productive of a desire to do something more than plain photography, of following out an idea by the camera instead of endeavouring to foist an idea upon a negative. If any proof be needed of the good work accomplished by the genus art photographer, it is only necessary to visit the Salon at the Dudley Gallery. There you will see the work that has emmanated from a howling wilderness of words. From articles by the yard, from conferences and discussions, until we were near to death's door, has emerged the Salon, and now we can forget and forgive. In the concrete the art photographer is rather wearisome at Society meetings, but we have little to complain of at the Photographic Club, as there are practically no representatives of this genus.

The "specialist" is a one-idea man, who deals absolutely and resolutely with one branch of work. Any paper or discussion upon his pet subject he will attend, though the heavens descend to bar his way. Generally, however, specialism rapidly grows to egotism, and he falls into line with the "know-it-all," the only difference being a limitation of subject, for which let us be profoundly grateful Another branch of this family is to be found in the one-developer. man, and others of the same kidney.

The "quibbler" is a curiously compounded individual, whose sole mission appears to be the intense desire to keep the members in the path of rectitude. Most chairmen know him well, as he constantly rises upon a question of order. He has the rules of the club at his finger tips, so tipped in fact that they easily fall off, and the meeting has to stop to consider the point raised. I have termed him a quibbler because much of his work is simply a waste of time, mere trifles he creates and magnifies into penal offences. To see this element at its best, the annual general meeting is the time and place. We can sum him up best as in moderation useful, in excess a bore.

We now come to a very different type, the "please-all," and a type of which we have but few representatives. From this man you cannot get a decided opinion, he agrees with you and your opponent at the same time. Such words as "but," "except," &c., are greatly requisitioned, and form the chief characteristics of his vocabulary. Says he, "I think Mr. Chairman, though at the same time I cannot be sure, but I *think* Mr. Smith's version of the minutes is correct, but we must all remember that Mr. Jones *did* raise the question of an excursion; and perhaps it would be as well to alter the sentence, as we know that such a good worker as Mr. Jones is to be relied on." Flattery, gross and indiscriminate, forms a large part of his stock in trade, he is usually suave in tone, pleasant in countenance, and deliberate in speech, and it is nothing short of marvellous how hs manages to agree with everybody. Ask him his opinion upon the Pall Mall and Dudley Gallery shows for instance, and he replies, "Both very good, my dear sir, very good indeed." This genus would become very tiresome were it not that he has few opportunities, because it must be evident that agreement all round is not always possible, and in such cases he holds his peace. He is really suffering from good-heartedness, his good nature and peaceful proclivities generally render him of little use except as a peacemaker. In this capacity he serves a purpose, and occasionally prevents a skirmish drifting into a general engagement. At the same time, as soon as the fighting becomes really earnest and fierce, he falls to the rear, not of his own desire but driven by the force of circumstances.

* Concluded from page 680.

And now for the last on my little list. This genus is a conglomeration of the wit, the funny man, the "frivoller." We all know his sphere of action, and I only include him because of absolute necessity if I am to sum up the individuals of a Society. His mission is to enliven the proceedings, and he ofttimes stays a quarrel by a timely jest.

The limits of a paper like this and that nuisance of a sand-glass at your chairman's elbow prevent the recapitulation of other types, but I think the principal have been described.

With the licence of idle thoughts, I am not going after all to answer the problem propounded at the outset. My idea was that by studying the individual we should find the Society, but I am bound to confess that I am not very much further forward. So we'll continue to pay our subscriptions and jog along quietly in our set spheres.

There are one or two points in the usual routine of Society life that I should like to refer to. They are idle thoughts in the sense of Maréchal Saxe's impromptus in the comic opera, *Madame Favart*. Says he, "You must not imagine that you can write an impromptu verse right off, several of mine have taken months of thinking out." And my idle thoughts upon some society matters are founded upon considerable experience. Three of these I will trouble you with, for they may lead to a fruitful issue in the shape of discussion, which is more than the preceding part of this paper will, I am afraid.

The competitive element in a Society is not an ultimate gain; at least it is not a gain to the Society as a body. The members benefit perhaps, but the body as a whole does not. The offering of prizes for the best pictures or best papers read is easy enough, and it undoubtedly gives a temporary push to a moribund association; but, sooner or later, friction results, and from this the body suffers, not the individual. Probably, of the various seeds of dissension—and there are many—nothing is so fruitful as Society competitions for prizes. I am not going to reveal any secrets, but it is a fact that, in connexion with Society classes at exhibitions, some shameful things have been done. The idea of a class or classes confined to members of a particular body must resolve itself into a desire for prizes. The very fact of its limitation proves this. In the old days perhaps, when exhibitions were few and far between, the Society only fulfilled its aim in organizing competitions for its members, and they undoubtedly urged the members on to produce better work; but now, with the enormous number of exhibitions and press competitions that surround us, such a procedure is quite unnecessary. It has ever been an evil, tolerated before for the reason I have just set forth, but now it should not be tolerated at all. The border question of competitions altogether does not come within the scope of these thoughts, but certainly Society classes are quite out of date. If competitions are necessary, let them be as open to the world as possible. But the member will say, "What chance should we have against some of the well-known exhibitors?" What chance do you want? Do you want to win an award by limiting your opponents? Because that is what it comes to.

Now, as to excursions and outings. What has been the cause for recent complaints as to the attendance? Simply that a too serious view is taken of the event. And here I must quote an idle thought that has already appeared in print, as it is precisely on this question. An outing or excursion should partake more of an open-air social. In most societies some evenings are devoted to a gathering of the members for mutual intercourse, and occasionally amusement, as distinct from the ordinary meetings. Why not, therefore, instead of meeting in a stuffy room at night, make the excursion of a similar character, and hold the meeting, so to speak, in the country, in the open air? Why not, in the full enjoyment of sunshine and fresh breeze, loll on the grass, smoke the pipe, and do our talking about cameras and plates, shutters and developers, &c., in the country? We should possess one advantage over the night meeting, which is that our cameras, shutters, and the various little fads we talk so freely about would be on the spot for demonstration informally.

A very natural reply to the foregoing is that it just expresses what is done now, and therefore it suggests nothing new. Admitting that that is the case to a certain extent, the fact remains that the event is not officially so considered, and the social side creeps in only according to the character of those present. My point is that, were it thoroughly understood that an excursion meant a social evening in the afternoon (please excuse the bull), in the country, it would stand a chance of greater success.

In the majority of cases no pictures are obtained at half-day excursions; we may get a few views. With the idea that the outing is for work, members become selfish. Brown leaves the party "on his own," secures perhaps one or two exposures, and carefully guards his secret as to the locality. Smith, at the end of considerable tramping, turns up at the station, and boasts of only having exposed one plate. "Nothing worth taking, my boy," says he. Jones trots off two chums to a special place he knows. Robinson does not believe that good work can be done in gangs, and leaves the party at the station on arrival. What does all this tend to? Why, to show that the general idea of an excursion is picture-making, plate-exposing—term it as you will.

The offer of medals for the best pictures taken at an excursion is a commonly tried experiment to increase the interest of the members in that part of society life. It is not successful usually; it merely means working after the Brown, Smith, Jones, and Robinson style. It arouses interest, but increases selfishness. An excursion or outing should be a social gathering in the country instead of the club-room, at which we may expose plates or we may not, we may secure pictures or we may not, but nevertheless we enjoy the outing.

The last point will help me to bring these thoughts to a connected issue. It is that of attendances, demonstrations, papers at meetings, and the usual routine of Society work generally. It must be obvious that it is only the ordinary nature of things to discuss, more or less, departmental subjects, which interest the few only. But opportunity should be taken, now and then, for some general paper that is within the grasp and interest of all present. I know that to myself weeks of optics, plate speeds, photo-micography, photo-mechanical work, orthochromatics, and such subjects become wearisome. We begin to grow serious and solid, and emerge with traces of old age creeping along the faster. But, if between some of these we have what might be described as something lively, we shall not feel any effects from the long course of technical study. Even an amusing paper is a relief, and it would be hard to find any paper absolutely devoid of information. Possibly my own thoughts tend to levity, whilst the reverend signors round me are more seriously inclined. Here another idle thought strikes me, which is that even the good old long-faced members are not averse to a little fun; at least I am sure I have heard some of them laugh. If societies want good attendances, they must study the lighter as well as the heavier side of photography. And yet another thing, the actual reading of a paper should receive more attention; this is sadly neglected. The style is often a hurried mumble, as if the reader was all the time thinking "what a bore it is to have to read the paper, but I've got to do it, and the sooner 'tis over the sooner to rest." Why should we not go to hear the speaker as much as his paper?

And here my wandering thoughts must come to an end for the present. If so be one of them furnishes food for discussion, so shall we even benefit by an idle thought. WALTER D. WELFORD.

A MARVELLOUS PRINTING METHOD.

[Wilson's Photographic Magazine.]

I HAVE discovered, or rather rediscovered, a printing process of such marvellous advantages that we have adopted it in our establishment and have tabooed all other methods for glossy prints, and are using now only the "aristo-platino" for matt-surface work, of the various print-out sensitised papers, except the genuine platinotype paper, which we use more than ever. Of course, I expect scores of photographers to claim that I am not original in the discovery, have fished up an old forgotten method, and they knew about it in old times, &c. All new discoveries meet the same fate. On the other hand, I will be held up as a "back number," an "old fogy," "don't know how to use the great unequalled hum-jingo paper that requires no skill," or the fine "aristo-sockdologer" brand that tones by itself and only requires a boy to do two printers' work, or the other fellow's paper better than all, that is guaranteed more permanent than carbon, as not one-half the prints made on it in three years have faded or changed, &c., *ad nauseam*. Now, in advance, I plead guilty to being an old "fogy," "ignoramus," and acknowledge to having done piles of work that I am ashamed of, and after over thirty years at photography I freely confess that I haven't learned half of it yet. In order also to stop all controversy whatever, I am the paid attorney of the big syndicate who are now manufacturing the new article and want to rob the innocent photographer of his hard-earned money. I hope that ends all personal controversy, am free to confess that I am not fond of fighting, and do so only when attacked and cornered, and have even got to that stage that I will try to get out of the corner if I honourably can. Now, in the first place, let me enumerate some of the advantages, and, if my readers will have patience to see this article through, will guarantee to convince each one that each assertion herein made is not only true, *but they will know it is true.*

Firstly, the prints are as easily handled in summer as in winter, neither lie on the bottom of the tank in washing, nor soften, nor become curl papers. I know some of these claims will sound like Munchausenism to the modern up-to-date photographer, but I will make every one of them good. Secondly, the prints don't bleach all to pieces in the hypo,

f a little stronger than usual, and retain all the detail in the half-lights, and are generally even and not wavy, and don't have a half-dozen tones n a print; in fact, with a little care, a batch of 500 prints may come out virtually alike. They don't get green or yellow by too long toning. The half-tones are not blue, while the shadows have the crimson hue, *and they require neither lead, ice, nor alum!*

Now I begin to see some of you becoming incredulous and wonder if something stronger than coffee is not represented here, but the reader can be assured that, as he has never seen me publish anything that was not substantiated heretofore, and generally proved to be the truth, he can rely upon every word herein said; and also that I have never used stimulants to any but the slightest extent in my life. But he must prepare for more startling statements. Instead of requiring *no skill* to use the process, *brains are actually required in this*, and each one has absolute control of the character of his work, and every 'cheap John' can't imitate him.

The number and variety of toning baths that can be used is boundless, each with its own peculiarity, only *real gold* is the article required with all, and that of any reliable manufacture, even our own, and the photographer is not required to purchase his chemicals from the maker of the paper in order to ensure success. But I almost forgot that the toning can be done in the evening and the prints can lay in water all night without injury, or longer to suit convenience. And I trust your credulity won't be imposed upon too far when I state that we are able to get along (in consequence of the prints not having to be toned in the morning and mounted as soon as washed sufficiently) *with one less hand*, also saving the constant moving the prints in the water. More than this, the spotting-out is so easy that our work is done more expeditiously than before.

Now don't get impatient and I will tell you all about it. . . . . Since writing the above I find it was all discovered in a dream, and find it all correct, only it should be the *past tense* instead of the present, and we have also made it suit the *future* tense, as the copy herewith of our little circular will show. This is sent out with each lot of pictures.

"Notice to Our Patrons.

"It will be observed that these pictures are the strong, well-brought-out albumen paper prints, with a medium polish, similar to those we made up to three years ago, and which a twenty-five-year test demonstrated to be permanent, when made by reliable photographers, and are not the extreme high-gloss aristo prints with a hard marble-like appearance, so much used of late.

"We have returned to this more expensive and troublesome process because the last three years' experience has shown not only the great liability to fade and defacement by rubbing and scratching of prints made on the high-gloss paper, but it has also demonstrated the better artistic quality and truer resemblance to human flesh of the albumen prints. We have therefore considered it the interest of our patrons, and incidentally our own, by the greater value attached to such productions, to discard what we consider an inferior process, and return to that which years of experience have taught us to be the best.

"Any one having high-gloss prints made by us in the last two years showing signs of fading can have the same replaced with albumen prints, without charge."

One thing was forgotten. We can make all our negatives now to suit albumen, platinotype, or matt-surface paper at the same time, and don't need to make negatives that would be only a mud-wash on such papers.

Now, photographers, let us consider a moment. Suppose no one had ever heard of the albumen process, and emulsion papers had always been used, would not every one at once see the truth of all that has herein been stated? Has the public really demanded "high gloss," or has the vitiated taste and larger competition for novelty among ourselves been the cause of all this demoralisation? I must confess that before manufacturers exploited these wares we never had any one to ask for anything better than albumen prints, and we got better prices. Even the glacé pictures had but a short demand. Three years ago, when I told my friend Falk we were going to adopt the emulsion papers, he said it "was a step backward." It was really against my own better judgment. We thought it was necessary to be "up to date," &c. I acknowledge the superior wisdom in this matter of one or two of our colleagues (one of whom probably does the largest business in cabinet sizes here) in having adhered to albumen all through and suffered no loss at all. We could probably have saved hundreds of dollars in actual outlay had we adhered to it. We have tried all the best brands of paper in that time, and have finally gone back to our first love.

Some may probably ask for our formulæ, &c. I will only say we use any good brand—Eagle, N. P. A., Three Crown, &c.—but we generally use the "Eagle," which roosts up at our friend Gennert's, on Thirteenth Street. I believe one of the "eaglets" (Gustave, Jr.) is raising a breed of hens that feed on silver, and so can make ready-sensitised albumen paper! We use a 65-grain silverised solution, slightly alkaline. We use blotters, fume nearly half an hour, as strong silver requires more fuming, and generally use the acetate toning bath, *never when freshly made*. But we have also adopted the improvement introduced by the veteran, W. H. Sherman, of using carbolic acid in the salt solution after fixing. This we find not only prevents blistering, but I think it acts also as an antiseptic to the albumen and prevents organic decomposition. The prints are certainly more fresh in appearance after a night in water than formerly, and I believe will retain their brilliancy longer. And I herewith take the opportunity of acknowledging Mr. Sherman's kind contribution to this heretofore rather troublesome question of prevention of blisters. We have not lost a print by this cause since we used his method. In conclusion, I will say that it is thegeneral impression that we will have a big company in our procession "backward."

D. Bachrach.

DOINGS AT THE CAMERA CLUB.

It has lately been asserted that the Camera Club, London, is becoming quite photographic, and after a perusal of the bill of fare provided for October, one is inclined to think that the charge is true. The first item is his notice of a retouching class; the next, four lectures by Captain Abney on *Light in Photography*. Then we have *The Struggle in the Dark Room*, by Mr. Newman, besides many other papers dealing with the camera and its work. Of course, such a programme would not be possible unless the Club were really a photographic one, and if these things can happen in chill October, when it is the fashion to lock up cameras, lenses, and all that pertains to them, until the sunny days come again, what will this energetic body of workers not do when May and June come round? Verily, then, "proceedings" will not hold all the reports of papers and discussions which will then come like an avalanche upon the devoted heads of the members of this very photographic club.

We are glad to see this hankering after what we may call "the legitimate drama," for there have been unkind remarks about those palatial premises in the Charing Cross-road. Some have hinted that more study was given to those branches of science known as gastronomics and culinatics than to photography, while some have affirmed that such abstruse problems as the angles described by colliding spheres on a flat surface have too much engaged the minds of the members. We are glad to see, therefore, that these higher studies have for the time been forsaken, and that the lighter allurements of photography have once more aroused interest.

It was prophesied by some, when it became known that Captain Abney, the President of the Club, had agreed to give a series of lectures on *Light in Photography*, that such a subject would not prove attractive to the members generally. But these anticipations were doomed to disappointment, and the first three lectures have been given to an inconveniently crowded room. Who says now that the Camera Club is not interested in photography? Doubtless, the knowledge on the part of the members that their President always has either something new to tell, or tells an old story with new and graceful garnishing, had much to do with this satisfactory state of things. Besides this, the lectures were experimental, and not mere dry addresses; there was thus plenty to see as well as to hear. With an electric lantern for diagrams and general illustrations, and another lantern on the table for sending a beam of light across the room for analytical and synthetical purposes, the club-room had sometimes a weird effect, reminding one of the picture in the Vernon gallery, *An experiment with the Air-pumps*. An artist would be able to make a good picture of such a subject, and, as a matter of fact, upon a certain occasion, a gentleman from one of our leading illustrated weeklies was actually employed in such work, albeit he must have been terribly handicapped by the frequent but necessary darkening of the room. These lectures by Captain Abney are primarily meant for new and inexperienced members, but the older ones were not slow to take advantage of them.

On the 17th there was a paper read by Mr. Briant, *On Working Out a Subject*. No one knew quite what this strange title portended. One can work out a periwinkle from its shell by means of the homely pin, or the timid rabbit from its burrow by the muzzled ferret; one can almost work an editor out of his chair if only time and energy be given to the operation; but how can we work out a subject? If Mr. Briant meant by the term that he gave so much care, thought, and time to each picture he produced, and was anxious to impart his methods of production to others, well and good, and it is a pity that a larger audience did not muster to hear all about cylindrical lenses, pinholes, slits, and all the rest of it. But Mr. Briant did not mean this at all. He spoke not stenopaically, but very sensibly, and read a capital little paper which was as full of thought as an egg is of meat. And he was wise enough not to illustrate it by any of his own work, for, however admirable his precepts, his examples are quite the other thing. Mr. Briant spoils a good deal of what he has to say by a laboured effort to be epigrammatic. Epigram is a useful weapon, but, like a sword, it should be used with discretion, not thrust into every crevice that presents itself.

The discussion on this paper started rather haltingly, for Mr. Briant is very rapid in his utterance, and gets through two or three sentences before his hearers have had time to understand the first of them. It was, therefore, quite reasonable for one of the audience to ask the Chairman (the Rev. F. C. Lambert) whether arrangements could not be made, as in some other assemblies, to send round advance proof slips of papers to be read at the Club. The Chairman said that this same question had been raised before, and difficulties were in the way, the chief of which

was, that members generally left the preparation of their papers until the last minute, and some, like himself, lectured from short notes only. The discussion brightened up a little when Mr. George Davison got upon his feet. He drifted somewhat away from the main subject by speculating what the painters would think of Mr. Briant's paper, supposing that they bothered their academical heads at all about it. Probably they would take exception to the whole thing. Mr. Wedmore for instance, who lately had given his opinions in the *Standard*, or Mr. Pennell, whose views with regard to photographic work they all knew so well. In their opinion, it was the soulless, mechanical camera that worked the whole thing out, and the man behind it had no control over the results. These painters limit the term "art" most narrowly, but they will not attempt to define it, for they cannot give any definition which excludes photography. Mr. Pennell takes exception to photographers because they try to imitate the methods of well-known painters. But the same objection holds good in their own craft. They either imitate others or themselves. Look, for example, at the work of Marcus Stone, who repeats himself year after year *ad nauseam*. And so on, and so on. One could not help wishing that Mr. Pennell had been present in his best a-thousand-words-a-minute form, so that he might have rained good-natured curses on photography and all its works. It hurts nobody, and is always highly amusing.

The Rev. F. C. Lambert, who makes an excellent Chairman, summed up the discussion in a few well-chosen words, congratulated Mr. Briant upon having for once left his eccentricities behind him, praised his paper mightily, and sent everybody home in good humour.

What a gift it is this one of making a good Chairman at a public meeting! These are as rare as snowballs in June. We speak from experience, a journalist having special opportunities of seeing and hearing those who occupy chairs in this important sense. We have seen a Chairman open the proceedings with extempore prayer; we have seen another take a manuscript from his tail pocket and solemnly read out a review of his subject presently to be unfolded by the lecturer—much to the latter's disgust; we have seen a Chairman conduct a meeting in a convivial spirit, having come fresh—yes, fresh from the dinner-table; and we have seen another who from the same cause, which, however, affected him in quite a different way, shed copious tears over the speaker of the evening before he answered his discourse. On one occasion we remember the Rev. Mr. Haweis was lecturing, and the Chairman had taken his seat without uttering a single syllable. The rev. gentleman waited for the customary words of introduction, but the chair was silent. He then turned to the audience and exclaimed, "Ladies and gentlemen, 'Behold a model Chairman!'" He proceeded to explain how he had suffered under the chairmanship of the garrulous, the idiotic, and the jocular. It was no wonder that he preferred a dummy.

Mr. George Davison can also give a good account of his stewardship while acting as Chairman of a meeting, as although he has very pronounced opinions upon certain subjects, he never forgets that he has a judicial function to perform, often as the arbiter between rival factions, and that he must be impartial. Such was certainly his position on the 24th ult., when Mr. G. A. Storey, A.R.A., took for his subject, *Photography from an Artist's Point of View: its Use and Abuse*. Mr. Storey is a genial little man, briming over with fun and good humour, and he raised many a laugh at his quaint way of expression. He was complimentary, if not enthusiastic, in his praise of photography; but he would not admit that photographers could be admitted within the artistic pale. At first, he said, he had declined the Secretary's invitation to read a paper at the Club, but that official would not be refused, and propounded a series of questions upon which such a paper as he had formerly suggested might reasonably be based. Then it was that Mr. Storey listened to the voice of the charmer and changed his mind. He took the Secretary's questions *seriatim*, and treated them as the heads of what proved to be a very pleasant discourse, and a discourse which was well illustrated with pictures.

We do not quite know what was the matter with the lantern, or whether the antics which the pictures performed were due to wrong marking or no marking at all. But portraits came in when landscapes ought to have been shown, and *vice versâ*. And it seemed as if no mistake could be rectified without the hideous black framework of the carrier being brought upon the screen—a kind of black gallows arrangement which became monotonous by repetition. Cannot the Club spend a shilling or two in a little necessary reform in this department?

Some of Mr. Storey's verbal illustrations were certainly better than his pictorial ones. He said that he knew little about photography, but he had come to the conclusion that photographs were best seen when thrown upon the screen with the light sent through them. Here he certainly agreed with Captain Abney and disagreed with Dr. Emerson. He did not say so, but, of course, this was the thought that occurred to many present. A photograph, he said, reminded him of the story in the *Arabian Nights*, where a fisherman found a bottle on the seashore, and, upon opening it, a cloud of smoke was emitted, which gradually resolved itself into a monster's form. It was the same with the camera, only the thing comes out of a box instead of a bottle, and there is no getting it it back again. What is it? Is it art or is it not? And then came a number of illustrations on the screen, with a little homily about each. This one was art—it was an architectural subject—this one was nature, the conclusion being arrived at that photography was a splendid copyist, for which Mr. Storey thanked it with all his heart—photography is copying, art is invention. There was a great difference between the two. And then came a happy illustration. Suppose that two chicks are born into the world—a town chick and a country chick. The first is born at a shop in Regent-street, and, when it seeks its mother, behold the incubator! The other chick is born in the country, in the farmyard, surrounded by pleasant sniffs of hay, and in the hearing of country sounds—the hum of the bee, and the lowing herds. It is met by the outspread wings of a living and anxious mother. The one is the product of a machine, the other the work of nature. There is a kind of art, copied from photography, which cannot be too strongly condemned; it is rampant in our illustrated newspapers and magazines. But, in spite of Mr. Storey's limitation of the work of the photographer, he admitted that the camera in the hands of a good man might be like paint and brush in the hands of a painter. But, of course, the majority of photographs were rubbish. And the rubbish floods our bookstalls, it is crammed into our letter-boxes, it gets into our very dust-holes, besides coming to us with our soap and our liver pills. Some of it, in the shape of process illustrations, has even wedged itself into one of the photographic Exhibition catalogues. Some of the Exhibition pictures Mr. Story praised very highly, especially the work of Mr. Hollyer. The paper closed with a reference to the effect which photography had had upon art. It had interfered very grievously with the arts of steel and wood-engraving, and had also come between the artists and the illustrated periodicals. Formerly some of the best men drew for these papers in black and white, and a capital school for practice it was; this is now in a great measure altered, and photography has come like a blight upon the scene. Photography has taught the public to be content with copies; but its work only represents the outer garment of art.

Then came the discussion. Mr. Briant in a light and airy way sat upon painters in general. He had seen many paintings in which the composition was splendid, but as works of art no good at all. On the other hand he had seen photographs in which all the accepted rules were broken which were simply delightful. Then he pointed out the falsity of a certain picture by Alma Tadema, and contended that the artistic value of a large number of accepted paintings was absolutely *nil*. It is noteworthy that this tirade did not cause the artists present to sink into their boots—nor did they seem to quail under the eagle glance of this didactic revolutionist.

Mr. Bergheim rattled off a brilliant little speech in his best manner. He quite disagreed with much that the lecturer had said. He hoped to have heard the truth, and nothing but the truth, but instead of this Mr. Storey had politely patted photographers on the back, and given them all a kind of post-prandial oration. For his part he thought it simply ridiculous that photographers should coolly dub themselves artists, without going through the drudgery and study by which alone such a title could be won. Let him take an illustration from a sister art—that of music. In Beethoven's Pastoral Symphony you do not hear the ducks quack, the sheep bleat, or the cattle low—yet you *feel* it all. In Wagner's *Siegfried* you seem to hear the birds sing. It is the impression conveyed by the artist. We have colour and tone in music as we have in painting, and the counterpart of the camera in such relation is the phonograph. Imagine a perfect instrument of this kind, place it in front of an orchestra, and get a perfect record of the composition performed be it by Beethoven or Wagner. But does such an action on your part constitute you an artist or musician? Are you a composer, a Beethoven? If I make a phonographic record of a song by Albani, am I equal to her? We are making ourselves the laughing-stock of painters, because directly we take a photograph we imagine ourselves to be full-fledged artists. It is preposterous, for this record-taking is a mechanical thing. One of his first essays as a photographer was the exposure of one hundred plates, some of which turned out to be splendid negatives—some of them when finished he could not place—he did not recollect the scenes at all. How could he possibly, under such conditions, claim to be an artist?

Then followed sledge-hammer Pennell, Esq., the most notable feature of whose speech was his abuse of Raphael's Madonna at Dresden, which he regarded as a blatant piece of shoddy commercialism—although people did go in to see it, and bow the knee before it, and almost worship it. Raphael, had he been alive now, would have gone into the cheap chromo-lithograph business. He could not be named in the same breath with Velasquez, Rembrandt, or even with Whistler.

Mr. Wedmore, who lately waxed so eloquent in the *Standard* anent the artistic claims of photographers, was next called upon to speak. "Now for Jove's thunderbolts" was the thought uppermost in every mind. But Mr. Wedmore on paper, and Mr. Wedmore in the flesh are two different beings, and he was as meek and mild as the historic Rev. Hopley Porter,—

"Who had a cure of souls
At Assesmilko-cum-Worter."

He owned that he had not much to say—and he said it. Mr. Blackburn of *Academy Notes* fame, thanked the lecturer for the liberal and broad-minded manner in which he had treated the subject. Mr. Lambert made a few remarks upon what, he looked upon as an epoch-marking evening, and then, in a few well-chosen words—with an occasional sly dig at the artists, Mr. George Davison summed up.

The little battle had raged for more than two hours, to be renewed once more when opportunity offers. It is a battle in which neither side

succeeds in capturing one of the enemy, for every one's convictions remain in precisely the same state although any amount of verbal ammunition has been discharged against him, and happily, so long as a good-natured man like Mr. Storey leads the attack, and Mr. Davision acts as umpire between the combatants, there are no wounds which require healing.

GENRE WORK AND ITS FUTURE.

[Read before the members of the P. A. of A. at Detroit.]

I HAVE been asked to say something about *genre* work and its future. It might be well before going any further to know what we mean by this term and what class of pictures it includes. Without stopping to discuss the word from the artist's standpoint, I will simply say that photographically it has come to mean any picture that tells a story or expresses a sentiment. We are sometimes startled at the magnitude of enterprises when they are brought suddenly to our notice. I am told that the tonnage of the various vessels clearing this port of Detroit is greater than the combined tonnage of all the seaports in the United States, and greater than that of any single port in the world. This involves some startling figures and must prove astonishing to those who have not kept track of the enormous growth of our lake traffic. To those who have regarded *genre* studies as something to make for exhibition purposes or for pastime it might be a matter of surprise to learn that thousands of dollars are paid yearly to photographers for this class of work. I have in mind a study of four children that has reached a sale of not less than 15,000 copies. I know of others that have sold almost as well. There may be those that have done even better—I speak of these from a knowledge of the facts. The demand was never greater than it is to-day. This is an age of pictures. The best talent in the world is engaged in painting posters for street display. The pages of our cheap magazines are brimming with reproductions that possess merit from every standpoint. What are photographers doing to supply this demand? Here and there a worker, but the field is not covered. Advertising houses are eagerly picking up everything that is picturesque and artistic, from infancy to old age. Why do we not receive more calls for magazine illustrations? Because we do not assert ourselves. Publishers do not know the value of our work. Mr. Uhl, the distinguished art critic of Washington, one of the Judges for the Ohio Salon, expressed astonishment at the merit he found in the pictures exhibited, was surprised that western photographers possessed so much artistic feeling. We are hiding our light under a bushel. In turning our energies in this direction we not only improve ourselves in all those higher qualities that make life worth living, but we open up the way for financial improvement. The opportunities for making a fortune lie in this direction, and not in making sittings at $3, $5, or $10 per dozen. The making of *genre* pictures has developed from a pastime into a business. There is an established market for such productions, and there are photographic studios whose main purpose is to supply this demand. While it is true that some of the popular pictures have been the occasional happy hit of some photographer, it is also true that the best sellers have come from those who make it their business to make such pictures and are quick to appreciate their selling qualities. But, whether one wants to make such pictures for business or pleasure, no branch of photography offers such magnificent returns for the investment as this. The field is illimitable. The whole range of the sentiments and the passions are at your service. You are only restricted by the want of models and appropriate surroundings. In many cases the appropriate surroundings are no surroundings, and the streets are full of models. Don't attempt too much. Leave the purely idealistic to the draughtsman. Homely scenes and subjects are the most effective, if the sentiment is properly brought out. The value of a *genre* study lies in its ability to tell its story. It is not what we see upon the paper simply that makes the picture charming. It is rather what it leads up to—the thought it suggests. It is this uplifting, this idealising of gross material, that makes a picture grand. Photography is too realistic to succeed in the higher realms of the ideal, but success can be had with less pretentious conceptions, and fame and fortune await the man of ability who works in this direction, for the time is coming when a picture will be judged by the results, and not by the method of its production.

GEORGE B. SPERRY.

EAST LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THIS Exhibition, the fifth held by the Society, was open on Monday and Tuesday evening last, at the New Tabernacle, Old-street, E.C., and it certainly spoke well for the enterprise of the Society. There were six classes, of which four were open and two for members' work. Of the latter, one was for pictures taken during the Society's outings. The awards offered were liberal in number, too liberal, and the Judges (Messrs. F. P. Cembrano, W. Colls, and Rev. F. C. Lambert), acted wisely in withholding a considerable number of them. The arrangements were, on the whole, satisfactory, considering the difficulties which had to be met; but we cannot help pointing out that the system adopted for notifying the titles and authors of the pictures should be carefully avoided on future occasions. The numbers, too, if necessary at all, were unnecessarily large.

The Champion Class was hardly a success, and the Judges declined to make any award. The most noticeable pictures were *Disturbed* and *Sunset*, by Mr. W. Thomas. In the Open Classes the highest award was made to Rev. A. H. Blake, for a very effective picture, entitled *The Fen Dyke*, a narrow upright picture, with a foreground of water and a sunset effect of sky, and considerable feeling is shown in the selection and arrangement of the subject; but, if the sky is truthful, the water is impossible, and *vice versâ*. The *Weir Stream*, by the same exhibitor, is marred by the sharp retouching of the waterfall, which ill accords with the somewhat exaggerated diffusion of focus of the other parts of the picture. Mrs. Macmichael, to whom the bronze medal is awarded, sends two portraits, which have some pleasing characteristics. The certificate is awarded to Mr. Smedley Aston for a little picture which is almost absurdly like Mr. Cembrano's medalled picture, now at Pall Mall. *A Windy Morning*, by A. E. Cooke, is quaint and interesting. *Ah, Things were Different Then!* is a skilfully treated half-length figure by Mr. J. E. Richards.

J. Gunston and F. Uffendale also show meritorious work. In the Novices' Class (by novice is meant one who has never received an award at an Exhibition) the only award has been a certificate to a very ordinary little photograph by W. J. Warren. *Nearly Bed time* and *Unshed Tears*, by C. M. Warren, are both good, nearly very good; the latter appears to be marred by an unevenness in the density of the negative, which might easily be compensated for by skilful printing. The Members' Class is a large one. C. Tylee, for *Sunset on the Creek*, gains the silver medal and the silver challenge cup of the Society for the best picture in the Exhibition by a member. This—it being the third time he has gained it—becomes his property. Mr. Tylee has several other exhibits in this and also in the Open Class, but the most interesting, and they are perhaps the most interesting exhibits in the Exhibition, are two, one representing a vase of flowers and the other a bunch of grapes, apparently coloured by hand, but actually prints on chloride paper, the tints being obtained by the local application of various toning solutions. The effect is remarkable. The production of red, yellow, and blue tints we can easily understand, but evergreen is here rendered with a fair approach to accuracy. A certificate has been awarded to Mr. Tylee for the group of flowers. The bronze medal in this class is taken by G. S. Pasco for a pretty little view of a river edged with willows, entitled *A Bend in the River*. The same exhibitor's *Chill October* contains the materials for quite as good, if not a better, picture; a little cutting down of the foreground, a slight tint to mellow the obtrusiveness of the water in the foreground, and a judicious treatment of parts of the negative, would do much. Mr. Pasco errs, however, in sending too much; some of his exhibits are very commonplace. Several other members err in the same way. E. Stone and G. E. Marshall both send work that shows a considerable amount of painstaking, which will doubtless improve upon more study and practice.

The class for work taken at outdoor meetings is fairly large. F. Uffendale, who shows a considerable amount of good work in the various classes, is awarded a bronze medal for *The Lea Valley*, an enlargement, but we must say we prefer the print from the original negative shown in another class, and F. Aldridge obtains a certificate for a pleasing little view of *Leigh on Sea;* a better print of more suitable tone could, however, have been made from the negative.

The awards were: Class A, Open Championship, none. Class B, Open, silver, Rev. A. H. Blake; bronze, Mrs. Macmichael; certificate, Smedley Aston. Class C, Open, Lantern slides, C. Baynton. Class D, Novices, certificate, W. J. Warren. Class E, Members, silver, and cup, C. Tylee, bronze; G. S. Pasco, two certificates to C. Tylee. Class F, Society's Outings, bronze, F. Uffendale; certificate, S. Aldridge.

A VISIT TO BRIN'S OXYGEN WORKS.

MONDAY evening, October 7, was the occasion of a visit by some sixteen or seventeen of our members to Brin's Oxygen Works, Horsferry-road, Westminster. Arriving there, we were introduced to Mr. K. S. Murray, the manager, who, after a few preliminary remarks, conducted us round the works, explaining fully the details of oxygen manufacture, and the part that each machine and appliance we saw bore in the process. We went there expecting to be interested, but I do not think that a single member of the party previously imagined that the details would be as interesting as they proved to be. The following is in substance a summary of what we learned during our visit. The Brin process is based on the fact, discovered by Boussingault, that barium *monoxide* (BaO), when heated to a certain temperature, absorbs oxygen from the atmosphere to form the *dioxide* (BaO_2), and then, if this BaO_2 be further heated, the oxygen previously absorbed is given off, and BaO remains as before. This, then, is the principle of the process as carried out at the works, with the exception of certain modifications which are found necessary in practice.

The atmospheric air is drawn from outside by means of powerful pumps, and is first of all purified by passing through two chambers containing respectively quicklime and caustic soda. These remove moisture and carbonic acid. Practically the lime does this alone, but the caustic soda, through which the air is afterwards passed, ensures its complete purification. After leaving the purifiers, the air is drawn into the oxygen

producer, which consists of a large, double chambered, brick structure, containing a furnace and a series of retorts. These latter, when fully charged, hold about two tons of BaO, and are heated to about 1350 degrees Fahr. The air being drawn through the BaO, the latter absorbs the oxygen thereof, and in about five minutes all the BaO is converted into BaO_2. The atmospheric air inlet is then closed, and the action of the pumps continuing produces a partial vacuum in the retorts. On the pressure being reduced to the equivalent of twenty-six inches of mercury, the previously absorbed oxygen is released from its union with the barium, and is drawn away into a gas-holder. The action is then repeated as before. Thus the atmospheric air is drawn in for five minutes, is then shut off, and the next five minutes occupied by pumping out the absorbed oxygen, including in that time one minute allowed at first for the retort to be emptied of atmospheric air, in order that the oxygen drawn off may be as free from nitrogen as possible.

It will be observed that there is a slight modification of the principles which were first mentioned, viz., that BaO_2 required to be further heated to reconvert it to BaO. Mr. Murray explained that it had been found in practice better to draw the oxygen off by means of a partial vacuum than to raise the temperature, as the constant fluctuations of the latter proved destructive to the retorts, &c.

The barium oxide, although expensive at first cost, is not so in use, because the contents of the retorts are only disturbed once a year, when they are removed, and, after mixing therewith a small percentage of fresh material, are replaced. A complete change of material is made every four years, by which time the BaO becomes impervious and less capable of absorbing oxygen.

From the gas-holder the oxygen is conveyed to the compresser, and the compression is effected in three stages. At first the gas is compressed to a pressure of eight atmospheres; it then passes to a second chamber, where it is further compressed to a pressure of thirty-two atmospheres; and is then passed to the third and last chamber, where it receives the final pressure of 125 atmospheres. Leaving this, it is conducted to a separator, which removes all moisture, and then is carried by means of copper tubes to the storage cylinders, which are filled close by. As the process of compression causes the gas to become heated, the final pressure is placed at 125 atmospheres, in order that, when the gas has cooled to the temperature of the air, the pressure in the cylinders may finally rest at 120 atmospheres.

After witnessing the charging of several cylinders, our party was shown the annealing chamber. Here, in order to ensure ductility, all new cylinders, and all those which have not been previously tested by the Company, are subjected to the action of a dull red heat for some time. Cylinders which have been in use for four years are reannealed, to counteract any possible tendency of the metal to become brittle from use.

The method of testing the strength of the cylinders, as seen in action by our party, was very interesting. The cylinders are subjected to a strain of one and a half tons per square inch, by means of hydraulic pressure. This being double the pressure to which the cylinders are exposed when charged with gas, it is considered advisable to further test, to see that the extra pressure has not injured the metal. With this object the cylinder is suspended in a cast-iron chamber, about fifteen feet deep. The chamber is made air and water-tight by means of a rubber collar, which is fitted round the shoulder of the suspended cylinder. From the bottom of the chamber a gauge tube leads to a graduated scale above. When all is ready, water is pumped into the chamber until it entirely fills all below the water-tight collar, so that the suspended cylinder below the shoulder is surrounded by water in a water-tight chamber, of which the only outlet is the gauge tube, the height of the water in the tube being noted. Pressure is applied to the cylinder, which causes the latter to expand somewhat, with the result that the water is forced to a higher level in the gauge tube. On the pressure being removed, the water in the tube falls, or should fall, to its former level; if it does not do so, it shows that the cylinder has become permanently stretched by the pressure, and it is therefore condemned as unsafe.

After seeing and having explained to us all the operations of manufacture and storage, we were shown one of the uses of oxygen. This was in the shape of the oxyhydrogen blowpipe. To show the intensity of the flame of this, the jet was directed on to a piece of thick iron plate, and in a few seconds the surface exposed to the action of the flame was melted, and a hole driven through. Similarly, a piece of half-inch iron rod was rendered incandescent in a short space of time, and glowed and sparkled in a way suggesting the fifth of November. This, with the exception of the vote of thanks which was unanimously given to Mr. Murray for his courtesy, concluded the proceedings, so that it may be said with truth that we had an enjoyable outing, ending with a display of fireworks.

A. D. F., in the *Hackney Photographic Society's Journal.*

MY BUSINESS METHODS.

[Canadian Photographic Journal.]

Having been put on the programme to state my method of doing business, I explain as follows: I try to make most of the sittings, as the one making the sitting is most likely to remember best the likeness, and thu decide if the proofs are correct. I invariably show a retouched proof, not only for the advantage of the customer, but because when the negative is retouched within the next two or three days, the appearance of the sitters is fresh in my mind, and I see at once if the retoucher has lost the likeness, or has failed in his duty in any way. The negatives I give out personally every morning to the retouchers, explaining special points, and, as a result, I think their work runs more evenly and they do better.

I have very few resittings, and invariably make an extra charge unless I am quite sure the order will be large enough to compensate me.

I do not believe in telling customers that there will be no charge for resittings, and I never practise it. My experience teaches me that the public do not value what they can get for nothing, nor respect the person that is willing to give without limit. We are valued according to the value at which we hold ourselves and our work. Photographers who advertise no charge for resittings, and sittings made until satisfied, must convey the idea of a lack of confidence in themselves, or else that there is no expense in making a photograph, and that their skill and time is of no value. It would be a great advantage to every photographer to conduct their business as mercantile and other professional men do. A doctor charges, kill or cure; a lawyer, win or lose; in fact, I do not know of any other profession that does not charge for their time and services.

Any one who honestly does the best he can should be paid for his time and work, and, in my opinion, photographers and their *employés* would work more cheerfully, and the public be better served when always assured of remuneration for their efforts. Even *employés* often get cross and soured in making or assisting in resittings, often for the slightest whims, yet there is no cost or loss to them, but they recognise the imposition.

B. L. H. Dabbs.

Our Editorial Table.

The "Fram" Dark Slides for Cut Films.

These slides are made both double and single. They are to be obtained from Messrs. Watson & Sons, 313, High Holborn, Messrs. Ross & Co., 111, New Bond-street, W., and Messrs. Hinton & Co., 38, Bedford-street, Strand, W.C., and are the invention of Mr. C. P. MacCarthy. The advantage of the slides is that they hold cut films very firmly round all four sides, and flat and rigid, and that carriers are dispensed with. They have no loose parts. All users of cut films know the trouble caused by carriers either not fitting the films (which are seldom cut accurately) or by the carriers not fitting the slides; and most users of cut films know the trouble, similar in nature, caused by films of different makers not fitting the grooves of ordinary film slides. The Fram slide does away with this difficulty and allows for slight variations in the sizes of the cut films, and yet holds and supports the film very rigidly, by means of a hinged board with a snap catch. The grooves all round, inside, in both, render them secure against light getting in, and it is a great advantage, in the dark room, to have no loose parts to mislay, no cardboard to get wet or frayed or lost, no zinc partition to get bent or dented. The Fram will be found very convenient for travelling, and for refilling in perfect darkness or in a bag where space is limited.

Mr. MacCarthy has submitted to us both models of the single and double Fram slides. The single one has a hinged back, and, the film being laid in position, the slide is closed and the film thus held at all four sides. A solid partition divides the two halves of the double slide, which is equally as effective as the single.

The Fram slide is a step in the right direction, and is sure to be appreciated by users of cut films.

The Photographic Studio.

By T. Bolas, F.I.C., F.C.S. London: Marion & Co.

We are always glad to see the name of Thomas Bolas on the title-page of a book on photography, for we are sure that the information contained within it will be at once accurate, practical, and concise. In the present little volume of eighty-nine pages, which is illustrated by various representations of studio constructions, Mr. Bolas first of all traces the development of the studio from Daguerrean times, and in succeeding chapters discusses the north aspect or open area studio and its various modifications, the tunnel studio and the south light studio; curtains, blinds, and screens; heating, cooling, and ventilation and other details germane to the main subject. The studios of Mr. Debenham, the late Mr. S. Fry, Rejlander, Mr.

Blanchard, and other noted workers, are referred to by way of illustrating practical points raised in the book, which we can cordially recommend as containing a mass of terse and valuable information likely to assist the photographer in erecting a studio.

Higgins' Photo-mounter.

Messrs. C. M. Higgins & Co., of 106, Charing Cross-road, inform us that they have substituted an enamelled screw cap in place of the spring cap used on the original bottles; although the spring cap was



exceedingly good, they found it at times rather inconvenient. On the small and medium-size bottles it was apt to cause the glass to "fly," and on the larger bottles it became so firm and rigid that force had to be exerted to take the cap off. They find the new screw cap suit admirably in every respect.

Perken, Son, & Rayment's 1896 Catalogue.

The Catalogue of Messrs. Perken, Son, & Rayment, Hatton-garden, which has been sent us, extends to nearly 230 pages—an eloquent reminder of the extent and variety of the firm's business. The well-known "Optimus" productions are here set forth with the fullest detail, including lenses, cameras (hand and stand), tripods, dark-room requisites, shutters, and an infinite number of other useful photographic *impedimenta*. Something like fifty pages of the book are set aside for the optical lantern and its accessories, all sorts of tastes and pockets being thoroughly catered for. The Catalogue, which is sent free, should be at hand for reference on the bookshelf of every photographer.

News and Notes.

Mr. H. Hands, of Jubbulpore, E. I., writes: "In reply to Thomas Pinder, in your issue of September 13, why does he not transfer his pictures in P.O.P.? He would find it meet his wants as well as anything. I shall be glad to forward him particulars if he gives his address."

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, November 6. The business will be the annual general meeting and election of officers, and to consider certain proposed alterations to the rules.

National Professional Photographers' Association.—The next Council Meeting will be held at Anderton's Hotel, Fleet-street, London, Saturday, November 9, 1895. Chair to be taken at three p.m. by Mr. W. Barry (Hull), President. All members of the Association will be heartily welcome at the Council Meeting. The dinner is at five p.m., tickets 3*s*. each. Members intending to be present are specially requested to send their names to the Secretary as soon as possible.

Mr. R. P. Drage writes: "Will you kindly allow me to announce that on Wednesday, November 27, there will be a show of lantern slides at the Photographic Club, Anderton's Hotel, Fleet-street, illustrating the various scenes visited during the Convention Meeting at Shrewsbury. Several Convention members have already promised their assistance, and I shall be glad to hear from other Convention members who can help. The members of the Photographic Club will be very pleased to see any members of the Convention in their Club-room that evening."

The Photographic Society of India.—The Eighth Annual Exhibition will be held in Calcutta in February, 1896. Prospectuses and full particulars can be obtained on application to R. Child Bayley, at the rooms of the Royal Photographic Society, 12, Hanover-square, W. British exhibits, if not too bulky, will be forwarded from London and returned there, free of all cost to the exhibitor, if sent to Mr. Bayley at the above address not later than November 23. In addition to the competitive classes, a loan collection of the best British work of the year is being formed, as was done last year.

The Salon.—Mr. Alfred Maskell writes: "Will you allow me to announce in your Journal that this Exhibition will close a very successful season on Saturday next, November 2, at 10 p.m. Pictures may be removed by their owners on signing the receipt-book from nine to eleven on that evening. After that time those which are not so removed will be returned to Messrs. Polak & Co., 63, Wardour-street, W., to whom all further communications respecting their return must be made. This regulation applies also to pictures which have been sold, unless other arrangements have been previously made with their purchasers."

Mr. J. A. Hodges writes: "Will you allow me to correct an error which appears in the formula for the lantern-slide developer which I gave in my paper on *Lantern-slide Making* at the Royal Photographic Society on Tuesday last. The constituents of the pyro solution and the proportions are correctly given; but, in the directions for mixing the developer, 'bromide of potash' is referred to instead of bromide of potassium, and, on the same line, 'four to six minims of ammonia' should read, 'forty to sixty minims of a ten per cent. solution of ammonia.' The mistake of the compositor is, no doubt, due to my careless writing."

The Society of Photo-etchers, an organization established for the advancement of photo-mechanical processes is now holding an Exhibition at Vokins' Gallery, 23, Baker-street, W. The Society has only started during the present year, and, whatever may be its prospects, its present position can hardly justify it in holding an Exhibition. The one exhibit emanating from the Society itself is that of Mr. F. Dovaston, who sends half a dozen or so photogravures of very small dimensions and a miscellaneous collection of photographs printed by the ordinary methods. There are also a collection of photo-mechanical prints of various kinds, most of which are familiar to those interested in photography, and an exhibit of photographic enamels and the materials and apparatus necessary for making them.

Death of Mr. Vernon Heath.—We regret to announce the death of one of the veterans of photography, Mr. Vernon Heath, late of Piccadilly, who passed away on Friday last, October 25, at Palace-street, Buckingham Gate, at the age of seventy-six. He was one who in his time played many a part, a lover of nature in every form, an enthusiastic photographer, his works being equalled by few, excelled by none. In 1848 he arranged the collection of pictures known as the Vernon Gallery at the National Gallery, which were bequeathed by his uncle, Mr. Robert Vernon, whose estate he managed for upwards of forty-five years. He had worked hard at photography, his works and enlargements having achieved a world-wide reputation. In the old wet-plate days, with a 12×10 camera, tent, &c., it was a work of labour and, with him, love. His tree studies, notably the Burnham Beeches, Scotch scenery, and historic mansions are well known. Some time since he wrote *Fifty Years' Recollections*, published by Cassell, and has only recently completed a work not yet published, *Forty-seven Years of a Photographer's Life*. To the *Times* he was a frequent contributor. One incident may be recorded: his photographing Landseer's lions in Trafalgar-square. A dark tent in those wet-plate days was looked upon as a Punch-and-Judy show, and forty policemen were sent from Scotland Yard to stop the traffic. The *Times* and other papers speaking in the highest terms of his works, his photograph of the late Prince Consort, and the action by Mr. W. H. Mason, will be well remembered; frequently he photographed at Court and members of the Royal Family. Mention may be made of his photographing the Princess of Wales, of which no less than 10,000 copies were ordered in *carte-de-visite* size by Messrs. Marion & Co. Mr. Vernon Heath, having survived all his relations, was buried at Kensal Green on Wednesday last, his old friend of over forty years, Horatio Nelson King (who, we believe, possesses all his negatives), following as chief mourner.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 19,711.—"Method of obtaining a Colour-sensitive Film or Plate." J. Joly.—*Dated October*, 1895.

No. 19,948.—"Improvements in Incandescent Gas Apparatus for Photographic purposes." F. S. Thorn and C. Hoddle.—*Dated October*, 1895.

No. 20,167.—"Improvements in the Production of Photographic Portraits." Communicated by F. Davey.—W. Davey.—*Dated October*, 1895.

PATENTS COMPLETED.

Improvements in Apparatus for Imparting a Predetermined Temperature to Liquids for Use in Developing Photographic Plates, and for other Purposes.

No. 22,013. Charles Edward Hearson, 5, Templar-street, Camberwell, Surrey.—*September* 28, 1895.

In developing photographic plates it is important that the developing liquid be brought to a standard temperature immediately before use, and it is also important that the water used for warming the developing dish be also brought to the same temperature. To provide means whereby the said liquids may be readily brought to the standard temperature when they about to be used is the object of my invention, which consists of the improvements hereinafter described in apparatus for imparting a predetermined temperature to liquids for the said purpose and for other purposes.

According to my said invention, I support a vessel for containing water above a gas burner, surrounded with a light-proof shield, having inlets and outlets for air, and I mount within the said vessel a thermostat, which I so connect to a valve governing the supply of gas to the burner that gas is allowed to pass thereto or is shut off therefrom automatically, according as the temperature of the water in the said vessel is below or above a predetermined degree at which the thermostat will act. I prefer to provide the thermostat with

means for adjustment, in order that it may be caused to act at any desired temperature within a given range, and I provide for constant burning of a small jet of gas at the burner by means of a bypass, the passage of gas through which is uncontrolled by the thermostat. Within the said vessel I form passages, which may consist of coils of tubing, one of which passages is connected with a supply of water, and the other with a funnel to admit of ready insertion of the developing liquid, and each of the said passages is provided with an outlet pipe, from which the liquids, which become warmed while flowing through the said passages, are received as required.

The kind of thermostat which I prefer consists of a hermetically sealed expansible and collapsible case or capsule, containing a liquid which boils at about the temperature required for the water in the vessel hereinbefore described, and the provision for adjustment of the said thermostat consists, or may consist, of a spring acted on by a screw.

Where the heating apparatus hereinbefore described is required for use where the light produced by a gas jet is not objectionable, the light-proof shield hereinbefore referred to may be dispensed with.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
4	Camera Club	Smoking Concert.
4	North Middlesex	
4	Peterborough	
4	Richmond	*More Pictures from Italy and the Riviera.* H. Little.
4	South London	
4	Stereoscopic Club	
5	Birmingham Photo. Society	
5	Bolton Photo. Society	
5	Brixton and Clapham	Lantern Evening.
5	Exeter	
5	Gospel Oak	Developing Competition.
5	Hackney	
5	Herefordshire	
5	Keighley and District	
5	Lewes	
5	North London	
5	Paisley	
5	Putney	*Simple Subjects and their Treatment.* W. Thomas.
5	Rochester	
5	Rotherham	
5	Sheffield Photo. Society	
5	York	
6	Croydon Camera Club	Photographic Chat.
6	Edinburgh Photo. Society	
6	Leytonstone	
6	Photographic Club	Annual General Meeting.
6	Southport	
6	Southsea	
7	Birmingham Photo. Society	
7	Bradford	Smoking Concert.
7	Camera Club	*Egypt.* Noel Cox.
7	Dundee and East of Scotland	
7	Ealing	Lantern Evening.
7	Glasgow Photo. Association	
7	Glossop Dale	
7	Hull	
7	Leeds Camera Club	*The Chemistry of Photography.*—II. Dr. J. T. Thresh.
7	Leeds Photo. Society	*A Visit to Venice.* John Gordon, jun.—Criticism of Lantern Slides. T. Ramsden.
7	Leigh	*How I Develop.* W. Hampson.
7	Liverpool Amateur	*A Drive Round Southern Corsica.* G. E. Thompson.
7	London and Provincial	
7	Oldham	
7	Tunbridge Wells	
8	Birkenhead Photo. Asso.	*Enlarging.* The President.
8	Bristol and West of England	
8	Cardiff	
8	Croydon Microscopical	Conversational Meeting.
8	Halifax Camera Club	
8	Holborn	
8	Ireland	
8	Maidstone	
9	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 24,—Mr. W. D. Welford in the chair.

Messrs. F. C. Briggs and Thomas Bowen were balloted for and duly elected members of the Association.

Mr. J. E. Hodd brought forward a new lantern-slide carrier, which he afterwards presented to the Association. It consisted of a carrier proper, working inside an outer frame, and contained two openings at the top for the admission of the slides, which, after being displayed, are raised clear of the carrier by means of a little brass arm running up an inclined plane upon the carrier being pushed along. It obviated excessive handling of the slide, and worked very simply and effectively, besides selling at a low price.

The Hon. Secretary showed a collection of tools contained in a small case, which also served the purpose of a handle, including screwdriver, drill, and a number of other useful articles, which he thought a good thing to have in one's pocket when out with the camera in case of need.

Mr. J. E. Hodd exhibited a new stereoscope, which was not yet on the market. The adjustment of the lenses was performed by a right and left handed screw, and the focussing by an ordinary rack and pinion.

Mr. W. T. Wilkinson presented a mounted collotype print of Mr. W. E Debenham's group of the joint outing of the London and Provincial and the Photographic Club at Hampstead, for the Association's portfolio.

Mr. R. P. DRAGE said that, in looking over some of his failures, he had found some film negatives, which he thought very remarkable. He passed round some specimens of the defects, and asked the opinion of those present as to the cause. One, taken at Lucknow, showed complete reversal, except in the sky, which was negative. He suggested the extreme heat as having something to do with it.

Mr. W. E. DEBENHAM had known it to be got by developing up green fog until it had become stronger than the image. He thought that the emulsion had probably been spoilt by something injurious in the celluloid film.

Mr. A. HADDON remarked that he had been told that a large proportion of the celluloid used was prepared with artificial camphor, and not real camphor, and thought the behaviour of the films might be traceable to this.

Mr. DRAGE did not, in reply to a suggestion, think the packing was the cause.

Mr. T. E. FRESHWATER thought the mode in general use amongst packers of soldering with spirits of salts would affect the contents by reason of the acid fumes, and always insisted on the use of resin.

The HON. SECRETARY gave the results of some comparative trials he had made with the Cooke, Collinear, and other lenses, and a short discussion ensued.

The following was taken from the question box: "Wanted, the simplest method of determining the relative speed of a shutter working between the lenses from the one-tenth to the one-thousandth of a second," and some doubt was expressed as to the actual meaning of the question.

The HON. SECRETARY recalled a method described by Mr. Varley by which it could be done electrically.

The CHAIRMAN thought the simplest way was Wilson's—by a revolving wheel—with whom Mr. BAYSTON also agreed.

Mr. J. E. HODD inquired whether it was a fact or otherwise that a shutter opening centrally gave more halation than others. He had found it so in the case of one he had recently been using.

Mr. A. MACKIE questioned whether halation was meant, and a discussion ensued as to this and on the properties and advantages of an iris form of instantaneous shutter.

Mr. BAYSTON remarked on the conditions of the developing competition of Mr. Watkins, and a long argument followed, the opinion being that the rule that the highest gradation of the scale should be matched was unnecessary, and that any of the gradations should be available.

PHOTOGRAPHIC CLUB.

OCTOBER 23.—Mr. F. A. Bridge in the chair.

Mr. LUBOSCHEZ gave a demonstration of platino-bromide paper. He paid justice to platinotype paper if good negatives are used with it; but it had also its drawbacks. The paper under notice had distinct advantages over platinotype paper. The exposure, two to three feet from fishtail burner, was about fifteen seconds. It is a developable paper, that is to say, not only with oxalate, but with any developer used for plates. It will yield a finished print, *i.e.*, not require strengthening in the blacks. The paper is too little known yet, but photographers will soon see the advantages of it. A large picture shown had five contact prints on it. The five were masked in various styles most effectively. In enlarging he advised, to avoid showing grain, focus without stop, then put in stop to give best definition; he preferred to give longer exposure, say, a stop requiring twenty minutes. He would give five minutes, then insert a larger stop. Change twice, then finish with open aperture. He claimed that it was a paper that could be handled like a lantern slide. He preferred oxalate, but any developer would do except pyro as now used, but even it could be made to yield a good result. He wished it to be understood that, so long as the operator had control of the developer, and not *vice versâ*. He used one ounce of iron to six ounces of oxalate of potash. Instead of using bromide. he preferred an old developer; there was a better chemical combination. He referred, by the way, to the advantage of using slow plates and paper. He proceeded to develop a whole-plate contact picture, which was passed round. For small work he recommended the smooth paper. Referring to the preference some had for a sepia tone, he said recourse would be had to, say, uranium. Well, that gave a very unsatisfactory, hard result. But, by simply putting the print just developed back into the hypo just used with spirit lamp underneath, he was able to produce a more satisfactory result approaching sepia. Artists know and speak of two sepias, the burnt and natural—one giving a yellow and the other a reddish tone. He left it to members to decide which they would call it.

Mr. HODD asked as to permanency.

The reply was that the paper had been tested for twelve months, and not any changes could be detected. Amount of alum in hypo, about one to ten, but not important.

Mr. WELFORD asked if, by wetting the paper first, there was not a risk of missing getting a brilliant result from a weak negative.

Reply.—No; the paper was repellent of solution, and therefore it was necessary io soak it first.

Mr. FRY asked if it was the same print that had been toned and treated after?

Reply.—Yes; but he preferred to dry it first.

Mr. HODD asked if Mr. Luboschez had met with blistering?

Reply.—Yes; but only where there was great difference in temperature of solution.

Mr. WELFORD agreed witth Mr. Luboschez in using oxalate. In using hydroquinone or amidol there was a great rush towards the final stage of development.

Mr. HODD asked if the sepia toning could be removed, and the print restored to the black by any after treatment.

Mr. LUBOSCHEZ said he did not think the paper worth it.

Mr. DRAGE asked if the stewing process had been tried with ordinary bromide paper?

Mr. LUBOSCHEZ said yes; providing the gelatine was of such a quality to resist the heat. Eastman paper would, but he had not tried others. He went to a great amount of trouble to give some valuable hints upon studio portraiture, by which term he meant the obtaining of a likeness. In few words, it may be taken that with a diffused light from one point a better result could be obtained than by a stronger light from the same point, and putting a reflector on the dark side.

It was pointed out by a visitor that the shortcoming of most studios was that they were too narrow.

The CHAIRMAN, in proposing a very hearty vote of thanks to Mr. Luboschez, said that it was a very rare occurrence to find the combination of skilful demonstrator and practical photographer. They had all listened with exceedingly great interest to the able lecture, and those studying portraiture could not fail to have learned some valuable hints.

Mr. LUBOSCHEZ thanked the members for the kind attention they had given him.

Brixton and Clapham Camera Club.—October 22, Mr. J. W. Coade (President) in the chair.—Mr. ALBERT HILL, of the Cresco Fylma Company, attended, and explained their process of stripping gelatine films and enlarging them by chemical means. The demonstration was watched with considerable interest, and went without a hitch from start to finish, the various films experimented upon leaving their supports with the greatest readiness. A brief outline of the process may be useful. Cresco fylma, the special preparation of the Company, is now sent out in the form of a powder, instead of, as originally, in solution, and it is intended for stripping the gelatine film from its glass support in the event of the latter being fractured, or in cases where a reversed negative is required for carbon or photo-mechanical printing. By its use the desired end can be achieved easily and with certainty, no special aptitude on the part of the operator being called for. In addition to this power, the photographer has placed in his hands the means of obtaining at the same time, if he so desires, a very considerable degree of enlargement without the aid of daylight or of any form of camera. The contents of a packet of cresco fylma should be dissolved in a small quantity of water, poured into an ebonite dish, and the negative or transparency be immersed in the solution. After a couple of minutes or so, the film will be found loosened from the glass, and may be completely detached by gentle use of the finger tip, or by simply rocking the dish. The whole is then lifted from the solution to a dish of plain water, and the film is floated on to a clean glass plate, or other support, either in its original position or turned over for a reversed negative. The plate then merely requires draining, levelling for a short time, setting up to dry, and a final washing to complete the process. Air bells can be removed by gently blowing upon the film whilst wet, and any little irregularity or cockling will generally have disappeared by the time the plate is dry. Should the negative be one which would be improved by enlargement, it is only necessary to leave the film for a short time in the plain water before transferring it, in order to bring this about. The film will be seen to gradually expand, and, when sufficiently enlarged, may be withdrawn and finished in the way just described. Slightly raising the temperature of the water aids the amplification, or, if none be wanted, a bath of methylated spirit will reduce the film to its original size. The image being still amenable to chemical action, any slight loss of density can be remedied by intensification. The lecturer explained that the developer used made no difference whatever in the stripping; but, if enlargement was intended, preference should be given to developers other than pyro, for this had a tendency to tan the gelatine, and so limit the extent to which enlargement might be carried. This tendency could, however, be nullified to some extent by soaking the negative to be operated upon in a solution of acetate of soda. He also pointed out that the stripping solution was quite without injurious effect on the fingers of the user. The extreme simplicity and apparently absolute certainty of the method, together with its adaptability to a number of decorative purposes, called forth commendations from all present, several remarking that they had regarded the specimens in the shop windows with a certain feeling of suspicion, which was, however, entirely dispelled on seeing the process actually in use. The Company's uranium intensifier, recently introduced, was also experimented with, and in this case again, the results were considered highly satisfactory.

Gospel Oak Photographic Society.—On October 15 the above Society held their annual Social Evening in the Congregational Schools, Lismore-road, and, considering the inclemency of the weather, the attendance was very good. After the refreshments, a flashlight photograph was take of the company present, and a slide made from the negative and thrown on the screen with some of the members' slides, which proved of great interest. The proceedings were interspersed with songs by Mrs. Hingston, Mrs. Hyde, Miss Randall, Mr. T. Adams, and Mr. W. Beyer; a selection was also given on the autoharp and cello by Mrs. Glover and Mr. J. Gittens. Programmes of the present half-session of this Society will be forwarded to any interested on application to the Hon. Secretary, Mr. W. A. Palmer, 13, Dale-road, Kentish Town. N.W.

Leytonstone Camera Club,—Wednesday, October 16.—A demonstration was given by Messrs. CRICKS & HARWOOD on *Uranium Intensifying*, reducing and toning the subjects in question causing a good discussion. In conclusion, the demonstrators expressed a hope that other members would endeavour to take up subjects of photographic interest, and deal with them in a practical form during the winter session.

SATURDAY, October 19.—The Fourth Annual Dinner was served in the studio, presided over by Dr. S. P. Pickett Turner. Afterwards a very excellent programme was successfully rendered, to the satisfaction of every one present, by various members and friends, Mr. S. P. Foster presiding at the piano.

WEDNESDAY, October 23.—Mr. G. H. Moss gave a very excellent and exhaustive paper and demonstration on *The Preparation of Collodio-chloride and Rough-surface Silver Papers*, dealing with his subject in a thoroughly practical way, his experiments in regard to plain salted paper being specially commendable for their simplicity and successful working. A most hearty vote of thanks brought an exceedingly interesting evening to a close.

Woolwich Photographic Society.—An Ordinary Meeting was held on October 24, Colonel C. D. Davies in the chair, when a very interesting discussion took place on *Failures in Hand-camera Work*, which brought together a good number of members, most of whom were hand-camera workers. The discussion was well sustained and productive of many practical hints. Afterwards members passed through the lantern slides which they had brought for trial and criticism, the evening being concluded with an exhibition of some interesting slides of Scotch scenery, lent by Messrs. F. W. Edwards and Esler, whose kindness the members much appreciated.

Birmingham Photographic Society.—Tuesday, October 22, was the first Open Evening of the winter season, when a crowded audience of members and their friends met at the Y.M.C.A. rooms, Birmingham, to hear a lecture by the President (Sir J. B. Stone, M.P.) upon a recent tour through Syria and Palestine. The first business of the evening was the presentation of the Society's Challenge Cup to Mr. W. T. Greatback, to whom it was awarded for the best work at the last annual Exhibition. The presentation was made by the PRESIDENT in a few appropriate sentences of congratulation for which Mr. GREATBACK expressed his acknowledgments. In the lecture which followed, the PRESIDENT gave a most interesting description of his journey, and illustrated it by excellent slides of the many places he had visited, including Malta, with its beautiful church of St. John; Crete; Cyprus; Egypt, with its marvels of information on the early pages of human history, as evidenced by its monuments and scattered remains, its temples and tombs; Jerusalem, Bethlehem, Damascus, Baalbec, with its magnificent temples; and many other places and objects of interest in Syria and the Holy Land. At the conclusion of his lecture the President was heartily thanked.

Leeds Camera Club.—Time was when but two photographic printing processes were known and practised; these, as older workers in photography will remember, were the "albumenised" and "carbon" methods of reproduction from the negative. Now there are printing processes innumerable—a few good, some bad, and many indifferent. The recently introduced and more brilliant "gelatino-chloride" process has quickly ousted its parent "albumen" from the field of popular printing methods, and of the early processes "carbon" is the only one now actively practised by the profession and amateurs. That it should so long have withstood the onslaught of its more modern competitors for favour goes far to prove its satisfactory working capabilities, and its extreme simplicity, cheapness, and beauty were conclusively shown by Mr. P. R. SALMON, an expert carbon worker, in a demonstration given before some seventy members of the above Club on Thursday last in their rooms at Brayshay's Restaurant, Bond-street. Carbon printing can hardly be included amongst the chemical processes. Chemicals are almost entirely absent both in the preparation of the sensitive paper, or tissue, as it is technically termed, and in its after-manipulation; the resulting image consists of a substance that is totally unaffected either by light, heat, or damp: hence a print in carbon is as permanent as the paper upon which it rests, and it is thus entitled to take its place with engravings, prints, and paintings for immutability of colour, tone, and density. Briefly, the process employed is this: A soft (soluble) gelatine is impregnated with a pigment of any colour or shade desired, bichromate of potash is added, and a paper surface coated with this mixture in the dark. When dry it is exposed in the printing frame behind the negative; but, as the sensitive paper is quite black, the progress of printing cannot be observed in the usual way, and it is necessary to estimate the requisite exposure to daylight by a comparison with some other "print-out" paper exposed at the same time, say "solio," as which it possesses about the same degree of sensitiveness. The action of the light renders the bichromated gelatine insoluble, whilst those portions protected by the denser portions of the negative remain soluble. If the print be now immersed in hot water, this soluble gelatine, together with the carbon pigment suspended in it, is dissolved out, disclosing the white paper behind; this forms the "high lights" of the picture, while those portions rendered insoluble by the action of light compose the shadows and blacks of the image, and the half-tones are correctly rendered by a partial dissolution of the pigmented gelatine. A short immersion in an alum bath to harden the film (recommended, though not absolutely necessary) completes a process than which nothing could be more simple, nothing cheaper, and nothing finer in result. Mr. Salmon, in the course of the demonstration, exhibited some beautiful specimens in carbon, kindly lent by Messrs. Elliott & Son, which were greatly admired. His demonstration was followed with intense interest, and has made many converts to the carbon process in Leeds.

Leigh Photographic Society.—Meeting held on the 24th inst., Mr. T. Lee Syms presided.—A discussion on cameras and lenses was led by Mr. W. Hampson. Afterwards, the Outdoor Portraiture Competition was held. Mr. W. Hampson gained the first and second prizes in the Senior competition, and two awards were made in the Junior competition.

Newcastle Photographic Association.—The Annual Meeting of the Newcastle and Northern Counties Photographic Association was held last week in the meeting-room, Art Gallery, Newcastle. Mr. J. P. Gibson, of Hexham (President), presided. The Hon. Treasurer (Mr. F. Park) submitted his report, which showed a balance in the bank at the end of last month of 3*l.* 19*s.* 8*d.*, being about 2*l.* more than last year. The Annual Report, read by the HON. SECRETARY (Mr. James Brown), said the Council had again to congratulate the members on the prosperous condition of the Association. The membership now stood at 125, not including new members elected at last meeting, as against 143 at the corresponding period of last year. This decrease was principally owing to the fact that the Council had decided to strike off a considerable number of members whose subscriptions were several years in arrear. New members continued to be admitted at about the same rate as resignations

were received. Whole-day outdoor meetings were held at Naworth, Brancepeth, and Dunstanborough, which were fairly well attended. Half-day meetings were held at Seaton Delaval and up the Derwent. These, however, must be pronounced failures. The lectures to beginners had been a very special feature in the year's record. The report concluded with a reference to the loss the Association had sustained by the death of Mr. M. Auty, of Tynemouth. The report was adopted on the motion of the President. The following officers were re-elected:—*President:* Mr. J. Pattison Gibson.—*Vice-Presidents:* Messrs. J. S. B. Bell, J. Hedley Robinson, W. Parry, John Watson.—*Council:* Dr. Blacklock, Messrs. W. E. Cowan, William Graham, George Hall, J. J. Kirkwood, E. G. Lee, T. O. Mawson, Captain Sayers, G. L. Snowball, William Thompson.—*Treasurer:* Mr. Fred. Park.—*Secretary:* Mr. James Brown.—*Assistant Secretary:* Mr. Parker Brewis.—The CHAIRMAN then gave his presidential address, in which he said he wished to refer especially to photography in press work. He first reviewed the present position of photography, and said that, in looking back over the year, he thought there had been very little startling or new in photography. They had had no great discovery, but there had been a great advance commercially. Photography seemed to have taken a higher place in the commercial world. It had become a necessity with the illustrated papers. Colour photography was yet a dream of the future. It seemed something like the end of the rainbow, which the boy chased and was always chasing. He fancied they would never see any practical application of colour photography. It did not seem to be quite on the cards. Hand cameras had made an extraordinary development during the past few years, and especially during the present year. Hand cameras had become something like a plague of locusts in the land, and people were "snap-shotted" in all sorts of ignominious positions. Some people, no doubt, had a right to complain. He hoped none of their members would do anything they ought not to do with the hand camera, such as taking photographs of bathing scenes, in regard to which there had been so many complaints. That seemed to be a rather objectionable use to make of the hand camera. It was impossible to recommend any hand camera as being better than the general ruck. A great advance had also been made in the manufacture of plates. Perhaps they had got no great advance in quality this year, but there had been a great advance in rapidity. The chief advance had been that rapid plates were now being produced at the same low prices as ordinary plates. This was due to a great extent to the cheapness of silver. When he commenced as a photographer he used to have sometimes to give something like 4*s.* 4*d.* to 4*s.* 6*d.* an ounce for nitrate of silver, whereas recently he had bought it at 1*s.* 9¼*d.* Then, with regard to manufacture of paper, great advances had been made in the manufacture of platinotype paper. Now from ordinary negatives they could get very good results. At one time they could only get a good platinotype from a specially prepared negative, whereas now, from an ordinary negative, such as used for silver printing, they could get a very good platinotype. It was a process which they would very much like to see come into more general use. He believed the death of the patent would help it very much. He came now to what they called the mechanical processes as distinct from the chemical processes. The first process was photogravure, which was nothing new, being considerably over thirty years old. It was really the old aquatint, namely, a sort of etching upon copper plates. Photogravure was a costly and difficult process, and did not make rapid strides in ordinary book illustration. It was more used for high-class work and the printing of plates. It was not the process which came into ordinary commercial use. The process they had in book and newspaper illustrations was what was called in the trade process work—a name which was given it by the wood-engraver, who worked by hand. Wood-engraving was rapidly becoming an extinct art. In process work, the branch which was called line work was exceedingly simple. It was generally done from sketches specially drawn for the purpose in Indian ink. Editors collected—he would not use a stronger word—photographs from which to produce those illustrations. Many photographers believed a certain amount of money should be paid for the copyright of a photograph used in this way. He thought it only right the photographer should have something for it when another was going to reap the benefit. He hoped a good many of them would join the Copyright Union, and get some kind of acknowledgment for the use of their photographs. He would not suggest any prohibitive price. At first a guinea was fixed, and the general consensus of opinion was that half a guinea would be a proper sum, though some might even think that too much. As newspapers had to pay for their letterpress, why should they not pay for their illustrations? The President concluded by moving a vote of thanks to the Treasurer, Secretary, and Assistant Secretary, which was carried by acclamation.

Sunderland Photographic Society.—The Annual General Meeting was held last week in the Fawcett-street Café. Mr. William Milburn presided over a large and representative gathering. The report showed that last year had been a most successful one, the winter meetings being well attended and the elementary lectures by the members of the Society much appreciated. The Council have made arrangements for suitable lectures during the winter session, and the photography prize slides and others will be shown. It was also arranged that an exhibition of members' work would be held in the course of the winter, which would be open to the members and friends. The Treasurer's report showed that the Society was in a flourishing condition. The following officers were elected for the ensuing year:—*President:* Mr. W. Milburn.—*Vice-Presidents:* Messrs. J. Lynn and Wm. Pratt.—*Council:* Geo. Bartram, A. C. Boulton, W. Broderick, W. Horan, E. R. Kirkley, A. Peddie, W. J. Pearson, and W. Pope.—*Hon. Treasurer:* Mr. T. Walton, 298, High-street.—*Secretaries:* W. N. Bartram and C. E. Cowper, 69, John-street. The meeting concluded with an exhibition of lantern slides by members and others.

FORTHCOMING EXHIBITIONS.

1895.		
November 1, 2.....	*Photographic Salon.	Alfred Maskell, Dudley Gallery, Piccadilly.
November 1, 2.....	*Southport.	G. Cross, 15, Cambridge-arcade, Southport.
,, 1–14	*Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
,, 19–21.....	*Hackney.	W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 22–30.....	*Stanley.	Walter D. Welford, 59 and 60, Chancery-lane, W.C.
,, 28–30.....	*Leytonstone.	B. Harwood, 110, Windsor-road, Forest Gate.
1896.		
March	*Cheltenham Amateur Photographic Society.	Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

MR. DALLMEYER'S ATTACK ON MESSRS. TAYLOR, TAYLOR, & HOBSON, AND THE COOKE LENSES.

To the EDITOR.

SIR,—Under the plea of upholding the etiquette of the trade, Mr. T. R. Dallmeyer makes, in your last issue, a spirited attack upon us and our lenses.

The stated purpose of his letter is to challenge the good faith of our advertisement calling attention to the new Cooke lenses, and to question our good taste in publishing it. We willingly accept this challenge.

Our advertisement contains two photographs which were taken before we had arranged to manufacture the Cooke lenses, and when it was our purpose to judge impartially the relative merits of these and other instruments.

The conditions under which they were taken were chosen specially to display fairly the effects of curvature of field and astigmatism, which are the chief defects of the rapid rectilinear lens, but from which the new Cooke lenses are comparatively free. Since that time we have had occasion to take other test photographs with lenses of the rapid rectilinear type, and to avoid inferior examples we have used lenses by various well-known makers. These photographs, with the original negatives, may be viewed at our London office by any of your readers who deem them of sufficient scientific interest. (The lens-makers' names are not published.) In all of them the effect of astigmatism at the same angle from the lens axis is just as strongly marked as in the one we have chosen for reproduction.

In thus dealing with the rapid rectilinear lens *as a type*, we choose perhaps the commonest form of lens, one which every photographic optician makes, and in which none has an exclusive right or interest, and we have not violated our code of good taste by pointedly referring to the work of any one maker.

We confess we are unable to recognise any breach of etiquette in this, nor anything even remotely savouring of a spirit of disregard for truth or for the claims of others. In this respect our advertisement will compare favourably with an announcement which Mr. Dallmeyer may have seen:—"————'s lenses are employed by *all* the leading professional and amateur photographers throughout the world." The italics are ours.

As makers of the Cooke lenses, however, we feel free to advertise the fact of their superiority, and are gratified to learn that many of Mr. Dallmeyer's friends take an interest in our advertisement.

Mr. Dallmeyer says: "The comparative illustrations in no complete or honest sense convey the comparative merits of the two instruments." If he means by this that the difference in definition between the two photographs is greater than will be found between the definition of the images of rapid rectilinear and Cooke lenses respectively at 22° to 25° from their axes, and on planes normal to and focussed on their axes substantially in the way we have described, we deny his statement entirely, and challenge him to prove it.

The process blocks used in our advertisement were made directly from representative negatives obtained under these conditions.

He says also that "the publication of *one set of conditions* in the comparison of two lenses is unwarrantably unfair, and that *for the purposes of such advertisement* a true diagram could readily be constructed, making an inferior instrument appear vastly better than a much more perfect one."

Under some circumstances this statement might be true, but that there is any truth in it as applying to our advertisement we do absolutely and unqualifiedly deny. The insinuation contained in the statement is, that the rectilinear lens is much more perfect than the Cooke, and that we

have chosen for our comparison a set of conditions favourable to the Cooke lens and unfavourable to the rapid rectilinear.

Will he produce an ordinary rapid rectilinear lens which, under any circumstances whatever, will give as perfect definition throughout its field as a Cooke lens is capable of giving under similar circumstances, and will he be good enough to state under what conditions it can be done?

Our own modest belief is that, while the Cooke is superior in many important respects, it is inferior in none, and we look forward to its occupying the place in public favour which the rapid rectilinear lens has so long and so deservedly enjoyed in the past, as the most useful of all then existing types of lens.—We are, yours, &c.,

Leicester, October 28, 1895. TAYLOR, TAYLOR, & HOBSON.

THICK AND THIN GLASS.

To the EDITOR.

SIR,—Like "Profanity," I have suffered and still suffer from the plague of "thin glass." Out of one dozen 12 × 8 plates recently opened eight have already "gone where the good negatives (and other niggers) go;" one broke in my hand, leaving me only a corner, three went in the dark slides, the other four in printing. What is the use of wasting our time in exposing such things? Those who work for pleasure, perhaps, will not mind it, but it means ruin and starvation to those who like myself have to live on negatives.—I am, yours, profanely, FRANK M. SUTCLIFFE.

Whitby, October 24, 1895.

USE OF THE SWING BACK IN ENLARGING.

To the EDITOR.

SIR,—Having often solved the question you so clearly explain in your leader of last week on the *Use of the Swing Back in Enlarging* by the equations that I worked out for your ALMANAC many years since, perhaps the two following equations which give the displacement from the normal position may be of use to some of your readers:—

$$d = \frac{p}{r}\left(1 - \frac{b}{a}\right)$$

$$D = r\,p\left(\frac{a}{b} - 1\right)$$

where d and D represent the required displacement, p = the principal focus of lens, r = the ratio of enlargement, and a and b = respectively the distances between two lines (or lines continued) at each end of the original negative that should be parallel.—I am, yours, &c., J. A. C. BRANFILL.

25 *Rosendale-road, West Dulwich, S.E., October* 23, 1895.

TELE-PHOTOGRAPHY.

To the EDITOR.

SIR,—Permit me to add a few words to qualify the concluding sentence in the very interesting article by Mr. E. Marriage, and published in your last week's issue, respecting the uses of tele-photographic lenses, as also to correct a further general prevalent opinion regarding the *exposure* necessary with these lenses. It is stated that "rapidity is sacrificed in exchange for adaptability to varying focal lengths." That this is true to a certain extent we fully admit; but if the positive lens be of high intensity, possessing a full aperture of, say, *f*-3 or *f*-4, and the negative elements not of too high a power, the loss in illumination resulting from positive and negative lenses being used in conjunction will not be sufficient to prevent the combination from being used for all ordinary instantaneous work.

As proof that the tele-photographic lens can be and is successfully employed for instantanous photography, we need only refer to Mr. R. B. Lodge's well-known delineations of bird life in a *wild* state; some of his recent work is now being shown at the Royal Photographic Society's Exhibition. Even with the positive lens (an R. R.) working at *f*-18, most perfect results have been shown us, where the exposure was *a small fractional part of a second*, and it is not so long ago that we delivered to the War Department of one of the foremost European powers a No. 3 portrait combination to work on a 12 × 10 plate for military balloon photography. So far we have received only favourable reports, and it need scarcely be pointed out that rapid exposure is a *sine-qua-non* for this class of work.—We are, yours, &c., *pro* J. H. DALLMEYER, LIM.,

25, *Newman-street, London, W.*, THOMAS R. DALLMEYER.

October 21, 1895.

EXPOSURE.

To the EDITOR.

SIR,—One or two points in the letter of Mr. Alfred Watkins in your issue of the 25th inst. seem to require notice. Mr. Watkins's quotation from his publication of 1890 completely anticipates my points, including, in its first sentence, the extensive, though not universal, misconception which I supposed to prevail as to the influence of distance on exposure. I regret that I had not the good fortune to see Mr. Watkins's previous publication.

The racking-out of the camera, of course, really determines *the relative value of the diaphragm used*, another of the several "factors" in Mr. Howard Farmer's system of exposure; and the consequent increase of exposure is not mentioned by Mr. Watkins as implying an *actinic* effect of distance.

It would seem, both from Mr. Farmer's formulæ, and from many others, that, *apart* from shadow-detail, which does not usually form a large feature, even in near views, distance is thought to exercise an amount of influence which, in ordinarily clear weather, can scarcely be attributed to the haze existing in a *stratum* of air twenty feet only in thickness (the difference between the first and second distances under consideration); though it is intelligible (even if exaggerated in the *formulæ*) in *strata* of, say, ninety feet (the difference between the first and third distances).

Mr. Watkins informs me that he has found experimentally that, on a clear day, there was no difference in the intensity of the respective images of similar objects placed at distances from the camera varying from five to 100 yards; and, that in the high Alps he has seen the air so clear that a mountain side two miles away required exactly the same exposure as one 100 yards distant. There remains the interesting point whether the shadow detail which the eye misses even at moderate distances, can, by suitable focussing, be obtained in the negative, and seen there under adequate magnification.

May I add that, as I hoped the first and last paragraphs of my former letter would show, I had no idea of figuring as a discoverer; but simply sought to indicate the more obvious lines on and beyond which I hoped that your pen, or some other, would take your readers. I am sure that it is by a slip of the pen, or a typographical error, that the clause "have fallen into error in the matter," appears in Mr. Watkins's letter within inverted commas.—I am, yours, &c. ROBERT G. WEST.

Wimbledon, October 28, 1895.

METOL.

To the EDITOR.

SIR,—I have recently commenced the practice of photography as an amateur, my habit being to use *Metol* almost exclusively as developer.

I am now troubled by very sore and painful fingers, and also an intense irritability of the skin of face and neck, with a dark red rash.

I have a vague knowledge that metol is dangerous to use, but I should be glad if any of your readers can inform me whether it is capable of producing the entire set of symptoms I have described, and if so, what is the remedy?

I should be further glad to know whether rubber finger-stalls may be relied on as a preventive in the future, or whether in view of the face symptoms, the poison may be communicated by vapour or gas arising from the developer in the dish.—I am, yours, &c., K.

London, October 29, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange ten backgrounds (by Marion and others), size 8×7, for interiors and exteriors, same size. Send photographs.—Address, T. HAYWARD, Devizes.

Wanted good half-plate camera outfit, with three double slides, in exchange for good cushion safety, new this season.—Address, ALBERT G. SILVESTER, 426, Ladypool-road, Moseley, Birmingham.

Will exchange Darlot portrait lens (takes good cabinet heads and whole-plate groups) for Quadruplex or Globe enameller.—Address, H. E. WATKIN, Grand Studio, Marine-parade, Scarborough.

Wanted, in exchange for a Ross thirty-inch focus rapid symmetrical (equal to new), a No. 5 Universal, or a twenty-inch focus Universal symmetrical, or a No. 6D Dallmeyer, and difference in cash.—Address, GEORGE HADLEY, Castle Studio, 36, Castle-hill, Lincoln.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED :—

C. P. Casstine, Swanley, Kent.—*Photograph of potatoes.*

Edmund Landor, 2, The Mall, Ealing, W.—*Photograph of head of cat.*

Henry Cooper, 17, The Drapery, Northampton.—*Portrait of the Rev. Joseph J. Cooper.*

J. L. Hopper, 4, Pendle-street, Nelson.—*Two groups of Lancashire Cricket League Champions for* 1895.

J. E. PALMER.—Colours sold specially for the purpose are supplied by most of the dealers. We should recommend you to obtain them; your trouble will then be avoided.

MOSCROP. — Place a ventilator (boards sloping downwards) near the roof at each end of the room, and a wooden shield sloping upwards to prevent the light entering the room.

E. H. M.—1. We do not know where it may be obtained, but possibly Messrs. Penrose & Co., Amwell-street, E.C., may be able to inform you. 2. You will find the process named fully described by Mr. Maskell in an article in our last volume.

S. LEDGER.—The incandescent gaslight is very good for lantern purposes, and will, doubtless, be more extensively used during the coming season than hitherto; but it will not compare with the limelight for brilliancy, even when the blow-through jet is employed.

RICARDO.—More than one article on the subject will appear in the forthcoming ALMANAC. The failures are entirely due to faulty manipulation, and not to the method itself. Space is too limited in this column to deal with the subject, seeing what is to appear shortly.

BROMLEY.—If the results enclosed are the best that can be obtained on albumen or gelatino-chloride paper, we should advise you to try bromide paper by development. Why not intensify the negatives? Platinum would be quite out of the question with the negatives in their present state.

S. E. B.—If the local authorities of your town forbid the erection as at present designed, we do not see what you can do but to modify it according to their requirements. By contesting the matter in the Law Courts, you will probably not accomplish much beyond landing yourself in a lot of expenses.

T. WELLS.—We do not at all like that form of studio, to which you seem to give the greater preference. With it you get only a direct front light, which you will find difficult to modify so as to get good *chiaroscuro* in portraits. Unless the studio is required mainly for copying purposes, we should recommend the form shown in a sketch numbered 2.

C. W. C.—As the agreement was a verbal one, there is no apprenticeship. The youth is not bound in any way, neither are you bound to keep him any longer than you desire. Of course, as there is no legal agreement between you, he can start in business for himself, or enter the service of another photographer in the same town—or even next door to you—if he likes without let or hindrance.

B. PARKER.—Get several spectacle glasses, varying in focus from fifteen to twenty-four inches, and try them with the lens, and select the one that gives the focus desired. The unmounted glasses, in the rough, will only cost a few pence each. Spectacle glasses, it may be mentioned, are only about an inch and a half or an inch and three quarters in diameter. Larger sizes would have to be made to order.

A. BARTLETT.—You are quite under a misapprehension. Collotypes have not, necessarily, to be made on a surfaced, enamelled paper. They can be printed on any good hard surfaced paper—drawing paper if desired. They may also be printed on thin cardboard if required. For subjects, such as those named, a surfaced paper would be very undesirable, but, as we have said, it is not a necessity of the process.

C. BARSTOW writes: "I enclose half of a bromide print. I shall be much obliged if you will inform me what is the cause of it turning purple. I have lost four or five prints owing to this. Ought they to be kept longer in the hypo?"—The print is badly stained, probably from its not being sufficiently washed before it was fixed, or the fixing was insufficient. These are the only suggestions we can make upon the meagre data supplied.

H. REID ask if it is desirable to add alum, or chrome alum, to gelatine that is employed for mounting carbon prints, and, if so, whether the same solution will answer for mounting albumen prints?—It is not at all necessary to use either of the alums in gelatine when mounting carbon pictures, indeed, they are better avoided, as they do no good and render the solution more difficult to work. For silver prints the alums should be avoided.

R. C. G.—We are afraid you have no remedy. As, we presume, the portrait was taken in the ordinary course of business, you can have no copyright in it. We surmise the portrait was taken for a third person, not the sitter himself; therefore he may possibly have a title to copyright, but much depends upon the conditions under which the picture was taken. Before commencing legal proceedings, we should advise you to consult a solicitor well versed in copyright law.

H W. (Malvern).—The prints in the periodical are, as you say, "atrocious to a degree;" but that, we venture to say, is not the fault of the blocks from which they were printed. The name upon them is sufficient to show that. The shortcomings are due to the paper and the printing. The paper is very bad in quality, and quite unsuited for fine half-tone block work, and the printing is as bad as the paper. The foreign blocks mentioned would have been no better, even if so good, if dealt with in the same way.

S. says: "Would you kindly tell me which is best, a six-inch or a five-inch focus lens for a hand and stand camera, quarter-plate size? The lens will be of the very best quality, and I propose to use the camera chiefly for 'stand' work carefully focussed, and to make enlargements on bromide paper."—In reply: Without saying which is best, we should personally give preference to the six-inch lens, especially as you propose doing most of your work on a stand, with which the greater length of focus is perhaps more desirable.

C. WATTS says: "I have made an enlarging camera, in which I have employed macintosh cloth for the bellows. I find that, when the camera has been put away for a week or two, the folds of the indiarubber stick together, and are with difficulty separated. Is there any way of avoiding this? The rubber cloth was obtained from a good shop, and I do not think it can be faulty."—This is by no means an uncommon fault with indiarubber bellows. The best think we can suggest is to dust the rubber over with French chalk, and then rub it well into the surface; that will tend greatly prevent the adhesion.

B. J. H. asks: "1. In taking a stereoscopic negative with a proper stereo camera and lenses, is it necessary to transpose the prints from that negative, from left to right? 2. If so, why? I have been told this must be done, but I cannot understand why, as the prints must be both alike."—In reply: The prints are *not* both alike, being taken from two points of view separated at a distance, approximately, of three inches. The reason that the prints must be transposed is that the left half of the binocular negative, as viewed through the film, comes out on the right side in printing and the right half on the left. Therefore it is imperative that the prints be cut and transposed in order to conduce to stereoscopic effect.

N. G. writes: Please say (1) what the cause of the circular spots is on prints enclosed; about half a dozen showed these spots, some very much more than enclosed, which were thrown away at time of enamelling; remainder of the batch were quite free; all printed within three days; all toned with same toning bath, strengthened with plenty of gold between every lot of eight to ten; all fixed together; put in separately, and kept moving; all printed on Ilford P.O.P.; Ilford formula followed. (2) Where can I obtain pyroxyline suitable for collodion emulsion, described in the JOURNAL of December, 1894?—(1) The spots are due to faulty manipulation. Probably air bubbles were allowed to stick to the prints while they were in the fixing bath. (2) Messrs. W. W. Rouch supply a suitable pyroxyline.

RECEIVED.—Elliott & Son, National Photographic Company, Wratten & Wainwright. These in our next.

CONTENTS.

	Page
PHOTOGRAPHIC PERSPECTIVE AND THE CRITICS	689
THE DESTRUCTION OF THE INVISIBLE PHOTOGRAPHIC IMAGE	690
A NOTE ON ANTI-HALATION PADS. By W. B. BOLTON	692
SOME IDLE THOUGHTS ON PHOTOGRAPHIC SOCIETIES. By WALTER D. WELFORD	693
A MARVELLOUS PRINTING METHOD. By D. BACHRACH	694
DOINGS AT THE CAMERA CLUB	695
GENRE WORK AND ITS FUTURE. By GEORGE B. SPERRY	697
EAST LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION	697
A VISIT TO BRIN'S OXYGEN WORKS. By A. D. F.	697
MY BUSINESS METHODS. By B. L. H. DABBS	698
OUR EDITORIAL TABLE	698
NEWS AND NOTES	699
RECENT PATENTS	699
MEETINGS OF SOCIETIES	700
FORTHCOMING EXHIBITIONS	702
CORRESPONDENCE	702
EXCHANGE COLUMN	703
ANSWERS TO CORRESPONDENTS	704

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A BUSINESS TOPIC.

It is not often that purely trade subjects are touched upon in the English journals devoted to photography, and rarely, if ever, are business matters brought before any of our photographic societies. If any proposition were made to bring any strictly trade questions before the Royal Photographic Society, it would, doubtless, be tabooed at once, notwithstanding that a very large proportion of its members are professional photographers. The same would probably be the case with most of, if not all, the other societies throughout the kingdom. When the Photographic Convention was first inaugurated, it was thought by some that the business element would be a feature, but little has been done by it in that direction. In America the case is somewhat different, and the business phases of photography have always had a place, more or less conspicuous, at its Conventions, and at times at the meetings of societies, and also in the journals. By the way, it must be recognised that we have a National Association of Professional Photographers; but its numbers are very limited, and what it has done towards advancing the business, or in raising the status of the art, is, so far, not much.

In the last issue of the *Canadian Photographic Journal*, an extract from which we gave last week, Mr. Dabbs explained the way he conducts his business. The article contains some very pertinent remarks as to the way he maintains his status amongst his *clientèle*, which many English artists would do well to follow, particularly with regard to the number of negatives taken of each sitter, resittings, retouching, &c. He mentions that he does not believe in telling sitters there will be no charge for resittings, or that sittings will be made till the sitter is satisfied, and the like, for his experience teaches him that "the public do not value what it gets for nothing, or respect the person that is willing to give without limit." He adds, that "we are valued according to the value at which we hold ourselves and our work." There is a great deal of sound business truth in that, which many professionals in this country would do well to take to heart and act upon, instead of following the practice they now do, as it would tend to raise their status and, at the same time, substantially enhance their profits as well as their returns.

The general public does not appreciate that which it obtains for nothing, neither does it what it gets for a low price so well as what it pays a higher one for. This is the case, as a rule, even though the two things may be equal in merit. Such, however, is human nature, and one would naturally surmise that photographers, who, above all others, have exceptional opportunities for observing the weak side of it, would be aware of the fact. It may be thought by some that, as competition is now so keen, if one photographer will not truckle to the whims and fancies of sitters, however absurd they may be, another will. That may be the case sometimes; but the artist who maintains his dignity and does not depart from his usual course of business, whatever that may be, unless there is reasonable ground for doing so, will, in the end, be thought all the more of by his customers, and thereby increase his business.

At the present time the portrait business may be said to be divided into two classes, with a wide gulf between—the very high priced and the very low. The middle class, which at one time predominated, seems, unfortunately, to have now become merged largely into the latter class. Middle-class portraitists appear to have, from time to time, reduced their prices and the quality of their work, instead of maintaining the former and improving the latter. As a result a certain portion of the public —and, unfortunately, not an inconsiderable portion of it either —has really been educated to low-priced photography. It has unnecessarily been thrust upon it, and it has accepted it. There is still, however, another portion of the public that does appreciate good work—and, one might also say, good prices—and does not mind paying for it.

Amongst the houses that are now in the most flourishing condition are some of those that charge the highest prices, the work, of course, being commensurate with them, some even having unique systems, almost amounting to "fads," of doing business, which are rigidly adhered to. We recently heard of a photographer in a provincial town where there is great competition, and prices generally were very low. His were high, and he would only take sitters by appointment, and then he always had the cash at the time of sitting, no matter how important a personage the sitter might be. He never supplied proofs in less than three or four weeks; yet he was, and is, carrying on a highly lucrative business. It is not improbable that the strictly enforced regulation, coupled with the uniqueness of the system, has something to do with the success, as well as the quality, of the work. We have in our mind just now a London house, conducted by a lady, that is doing a very profitable business. Here only ladies and children are taken, a previous appointment being necessary. Gentlemen are not taken under any circumstances. We are told that even ladies

and children, if they are strangers, are not taken unless they are introduced by former sitters or friends. How far this original system of doing business has conduced to its success we cannot say, but we do know that the work issued is of a high class.

We merely allude to these cases to show that, in face of the present keen competition and the extreme "cutting prices," what Mr. Dabbs says of Canada applies equally to this country, and that the public do, to a great extent, appreciate the photographer and his work at the value set by himself, also that it will conform to any reasonable terms. There is no question that much of the present unfortunate state of portrait photography, with many, has been brought about by their not maintaining their business status, by putting too little value on their work, at a time when there was no necessity for it.

THE ECONOMICAL USE OF THE FIXING BATH.

A CORRESPONDENT writes to us on the above subject, and, as his letter presents some features of an interesting character, we give the important portion of it in full. He says:—

"I gather from what has appeared in the columns of the JOURNAL, as well as from my own experience, that the recovery of silver residues from the positive fixing bath for gelatino-chloride paper is scarcely a remunerative operation to the ordinary amateur. I am like a good many others—I only work at intervals; my negative fixing bath is used over and over again, and works, with occasional strengthening, for a long time both for negatives and lantern slides, any slight discolouration it produces in the films being easily removed by suitable means. But paper proofs I only tone and fix at wide intervals, when I have a sufficient number to make it worth while; but, though the hypo solution may be after use comparatively rich in silver, I cannot afford the space for storing up successive batches until a sufficient quantity has accumulated to operate upon economically. . . . You will say, perhaps, I can throw down the silver from each batch by means of liver of sulphur or zinc, and store that in a small space. So I can theoretically, but practically I can't, as time and space are not available for this easy but unpleasant process. It has struck me that the weak bath used for positives might, after concentration, be passed into use for negative purposes; but I find, on applying heat to the hitherto colourless liquid, it darkens, becomes muddy, and emits a distinct odour that tells of liberated sulphides. Here I am stopped for want of knowledge of the change that occurs. Palpably the silver is thrown down, probably in the form of sulphide. Is this so? and can the whole or greater part of it be extracted from the solution in this manner without introducing any further complications? If so, it would seem an easy way of gradually collecting the silver from the fixing baths, as it is equally applicable to the negative solution, which must be far richer in silver, and which, by this treatment, should be rendered fitter for its proper function if occasionally freed from some of its overload of silver. . . . It is not economy of hypo I am aiming at, as that is cheap enough, but a systematic means of collecting the large percentage of silver that must be recoverable from the various clearing baths."

The method proposed to be adopted by our correspondent consists of mixing up the accumulations of hypo, whether from prints or negatives, and at intervals of a few weeks or when convenient exposing them in a porcelain or enamelled metal dish on a hot stove, for the double purpose of concentrating the solution sufficiently to adapt it for negative use and to throw down as much as possible of the silver, which can then be separated by decantation. The proposed plan is ingenious, and apparently simple, but we fear, for chemical reasons, it is scarcely to be recommended, either on the score of economy or of safety.

From another portion of our correspondent's letter we judge that he assumes the change that takes place in the positive fixing bath to be the same as that which occurs in the case of the negative bath, but that it is produced in the latter case by saturation, and in the former is hastened by heat in the less highly charged solution. Such, however, is far from being the case, as we shall show presently, and we feel sure no harm will be done if we put in a plain light the reactions that really do occur, although we may reiterate what has been frequently said before.

The chemical change that occurs in the photographic operation of fixing is a very simple one in the first place, if properly performed, but serious complications may easily arise under other conditions. The outward and visible sign of fixation is, of course, the solution of the silver haloid, but chemically this involves a double decomposition resulting in the formation of a soluble haloid and one of two double hyposulphites, depending upon the quantity of hyposulphite of soda present. In the case of a very large excess of that salt, which should always be the condition for proper fixing, the following reaction takes place:—

$$2AgCl + 3Na_2S_2O_3 = Na_4Ag_2(S_2O_3)_3 + 2NaCl.$$

That is to say, three atoms of sodium hyposulphite decompose two atoms of chloride of silver, forming chloride of sodium, and a *soluble* double hyposulphite of sodium and silver, in which two of the atoms of sodium in the original hypo are replaced by silver. But, if the quantity of hypo present be insufficient, the chloride of sodium is formed in the same manner, but the silver combines with a smaller proportion of the hypo, an equivalent proportion in fact, and forms a double salt that is insoluble, or practically so. Thus

$$AgCl + Na_2S_2O_3 = NaAgS_2O_3 + NaCl.$$

The double salt in the first case consists, in fact, of two parts of the insoluble compound formed in the second in combination with one part of hypo, which gives to the mixture its solubility. The insoluble double salt is indeed soluble in sodium hyposulphite, and these reactions show how absolutely necessary it is that sufficient hypo should be used, and sufficient time allowed, in order to secure perfect fixing. The employment of too weak a solution, even if fresh, or too short an immersion, or the adhesion of the prints, through cramming too many into a small bulk of solution, will all tend to prevent the formation of the soluble double salt, while the use of an old bath, however strong, is further objectionable from another point of view, as we shall show.

So far as the fixing of positive prints is concerned, the only points that require attention are plenty of solution of proper strength, and a sufficiently long immersion; but the question of using that bath up to its fullest capability raises others. Granted it is not nearly exhausted when it has done its primary duty for positives, and might be used again for many more if not kept until other decompositions have commenced, it is too weak in its present condition for negative use owing to the lower degree of solubility of bromide of silver, still, it may be so employed if time be no object, although, for the very reason just stated, it is not advisable to do so without strengthening by the addition of fresh hypo, which is a plan we often adopt. But to strengthen it by concentration by the aid of heat is in every sense injurious. Our correspondent's observation in regard to the discolouration and muddiness, under such circumstances, is quite correct, as is also his surmise that the deposit consists of sulphide of silver; but that the solution can be cleared of the silver in this manner without further change is not the case.

The action of heat on the hyposulphites of silver and of sodium and silver is to split up the latter metal into sulphide

and sulphate, besides setting up other decompositions of the hypo itself, which result in the formation of other dangerous compounds, including sulphuretted hydrogen, sulphurous acid, and probably sulphide of sodium, to say nothing of the reduced fixing strength of the solution from these and natural causes, the addition to it of such dangerous materials, as well as the fact that a soluble salt of silver is still left, for the sulphate of silver remains unremoved, it must be clear that the method proposed is neither a safe one to pursue, nor, if it were, does it secure the whole of the silver residue. The application of heat, indeed precludes the possibility of taking advantage of the slight economy arising from its use after the addition of more hypo, or of concentration by spontaneous evaporation, which is also admissible. If the solution after use be left exposed in a flat dish to the atmosphere after being rendered slightly alkaline, it can be concentrated even to crystallisation without the decompositions we have mentioned; but even that method is not without danger, and, after all, *cui bono?*

Turning to the negative fixing bath and the practice of using it over and over again, we are fully aware that a vast amount of carelessness, if not worse, is shown in this matter. So long as the bath *fixes*, and, as our correspondent remarks, the slight stain produced is easily removed by suitable means, the careless worker supposes that all is right; but is it? Do we never hear of "mysterious" cases of negatives fading or changing colour in course of time, although "thoroughly fixed" and "perfectly washed," &c. Yes, far too often; but those who complain are the last to attribute the effect to the right cause—the employment of an over-charged fixing bath, simply because *all* their negatives are not so affected. Now, it is quite possible to employ an old and discoloured bath for a very long time, and, under certain conditions, to experience no ill result; then all at once it may get into a state in which evil results do follow, not at once, perhaps, but in course of time, and then, again, all may go right again. Or, to put it in another way, faulty or discoloured negatives may crop up that have been fixed in the same bath as others that have not gone wrong, though they may have been fixed subsequently, and though the bath may never have been replaced or renewed except by the addition of fresh hypo to strengthen it, and water to make up for that lost by evaporation and use. It is just this irregular system of strengthening only when obliged that causes the trouble. So long as the bath fixes in a decent time, and does not stain the film, all is supposed to be right.

As regards the staining of the film at the time of fixing, that may be omitted from our present calculations, since it is rather due to discolouration by the developer, either in the film itself or introduced into the fixing bath, than to decomposition of the hyposulphites. If the plates were thoroughly, perfectly washed—a practical impossibility in every-day practice—before going into the hypo, the latter would colour very little in the course of use; but, as it became exhausted, it would gradually deposit a sediment, which, if no other decomposition occurred, would be white, or nearly so. This would be the insoluble double hyposulphite already mentioned, and its formation would show that the bath was getting exhausted, for perfect fixing was already exhausted, for its only fixing strength would then lie in the one atom of hypo which holds the soluble double salt in solution and which, as it combines with a fresh portion of silver bromide, has to drop, in the film or in the bath, it matters not where, some of the silver it already holds.

This is stating a very extreme case, because, if from no other reason than the slowness of fixing, it would be strengthened before this stage arrived, though that would not remove the danger, for the fact remains that the hypo solution is capable of fixing—perhaps even thoroughly—long after it has ceased to be fit to do so. It must be borne in mind that every fresh plate fixed introduces so much more silver, which remains, up to a certain point, in solution; the very fact of a soluble silver salt being present argues possible danger to a gelatine film, but that is lost sight of. The double hyposulphite goes on accumulating, if allowed, until a point is reached at which the solution refuses to hold any more, and may be said to be saturated, and the rapidity of fixing begins to disappear. Fresh hypo is added, but its chief use is simply to keep the silver in solution, for it will retake up any that has been already precipitated, and this supplies the reason why the rapidity of action of an old bath is so little affected, however much hypo is added. It is practically saturated with silver, and consists mainly of the soluble double salt, the fixing powers of which, as may be imagined, are not great.

We have spoken of the possibility of perfect fixation in such a bath, and it may be possible, if sufficient time be allowed, that is to say, there may be a sufficient excess of hypo present to bring about the formation of the soluble double salt. But the chances are that the excess is not sufficient to prevent its decomposition in the course of washing—for this contingency has to be looked to—and so the plate becomes practically insufficiently fixed after all. Then, what must we say of the permanency of a gelatine film that is saturated with a strong solution of even soluble silver hyposulphite for so long a period as these must be? Even silver nitrate, which is perfectly soluble in water, is practically unremovable by mere washing when once it has touched the film. What shall we consider the probabilities in the case of the unstable compound under notice?

Whoever follows the practice of using the fixing bath over and over again, should at least add to it that of employing a second bath, as has often been recommended; and for this purpose the used positive bath comes in very conveniently. But, so far as using it up as suggested by our correspondent, we think our foregoing remarks will prove that those who have not the convenience for systematically and properly saving it for residue purposes will find the truer economy in throwing it away rather than in "tinkering" at it in the way suggested.

A Large Photographic Telescope.—Dr. Gill's report of the work of the Cape Observatory describes the progress of the new telescope generously given by Mr. Frank McClean, F.R.S., to that institution. The instrument will have an object-glass of twenty-four inches aperture and twenty-two and a half feet focal length, and will be provided with a prism of the same aperture in refracting angle of seven and a half degrees. The telescope and its housing is being constructed by Sir Howard Grubb, and is expected to be ready towards the end of next year.

A Substitute for Compressed Oxygen.—According to the *Lancet*, liquid atmospheric air is now commercially produced. It appears that, as the air gradually assumes the liquid state, it becomes much richer in oxygen, seventy per cent. being the usual proportion. If necessary, a still further quantity of nitrogen can be eliminated. It would appear natural to assume that this liquefaction will be a costly process; but, if under some modification of it compressed air containing very little nitrogen can be obtained, it is probable that the Brin process may have a formidable rival.

Acetylene Illumination.—The Neuhausen Company, who upply the calcium carbide for producing this gas, make statements

that are rather disappointing to those who are anticipating almost a revolution from the introduction of this new illuminant. They think that the water power they have at command would not suffice for the demand that would arise if the use of the gas became general. Further they are of opinion that at its best it is not equal to the Welsbach incandescent burner. Its future field of usefulness they believe to lie in its adoption for places where there is no coal gas available.

Another Microscopic Illuminator.—At the last meeting of the Quekett Microscopical Society, Mr. Godwin showed a new lamp of ingenious construction and extremely small size. Its main peculiarities consisted in its chimney being of metal, the illumination being emitted through one or other of two circular glazed apertures cut into its side. The perfection of the flame it gave would render it valuable in photographic work. This was brought about by making the burning portion of the wick out of a piece of folded blotting-paper attached to the wick proper, which thus served as a feeder only. The charred portion was removable by simply passing the edge of a knife across.

The Forthcoming Solar Total Eclipse.—We see, from the advertising columns of a scientific contemporary, that the Orient Steam Navigation Company are preparing, at a cost of forty guineas each passenger, to send out a steamer to Vadsö in the Varanger Fiord, Lapland, to leave London on July 24, calling at several places of interest on the way, and arriving at Vadsö on August 3. Colonel A. Burton-Brown recently read before the Royal Astronomical Society a paper descriptive of the possibilities and probabilities of success in connexion with an expedition for observing the phenomenon. That there should be no mistake made in selecting suitable spots, he went over the whole ground himself, and in his paper, which for full details may be found in No. 3, Vol. IV., of the Society's *Monthly Notices*, gives a description of the most probably suitable spots. His hints are valuable and practicable. He evidently thinks best of Vadsö, for he says there are several hills there of two or three hundred feet in height easily accessible. "Indeed, Vadsö should be looked upon as the headquarters of an East Norway expedition."

JOTTINGS.

It is impossible to overlook the fact, when one takes a glance through the periodical literature of photography, that the use of the initials, "F.R.P.S." as an appendage to the names of those authorised to employ them, is on the increase. I hope the custom will further extend, for such a display of legitimate pride in the possession of the Royal Photographic Society's fellowship is calculated to enhance its value in public esteem and to make its attainment an object of commendable ambition on the part of young photographers. I suppose that in the future neither membership nor Fellowship of the Society will be available except by examination. This is as it should be; but, when those glad times arrive, may those of us who have obtained our Fellowships on the easy terms of "opting" for them, be spared the bitterness of being looked down upon by those who have nobly demonstrated their ability to floor the examiners.

Reference to the Royal Photographic Society's Fellowship reminds me that the other night I was dipping, not by any means for the first time, into a book that is probably the one book of all others which, conscientiously studied, will help a thinking photographer to stamp his camera work with individuality—I mean, of course, "Naturalistic Photography"—when I came across a passage in which the author, Dr. P. H. Emerson, foreshadowed the time when Fellowships and diplomas would be part and parcel of the Society's mission and existence. The passage was written in the early part of 1888, and, in view of what has happened since then, its reproduction here may not be without interest.

Dr. Emerson says: "We fondly hope that a college of photography may one day be instituted where good art and science training may be obtained, where regular classes will be held by professors and regular terms kept, and where some sort of distinguishing diploma, as Member of the Royal Photographic College, will be given to all who pass certain examinations. The M. R. P. C. would then have a status, and the profession which would then exist—but only exists as a trade now—would be able to draw up salutary laws for the government and good behaviour of its members, and the status of photography would be everywhere raised. The diploma of F. R. P. C. (Fellow of the Royal Photographic College) could be given to distinguished photographers at home and abroad as an honorary title." We are certainly well on the way towards the realisation of Dr. Emerson's aspirations, more than one of which, it will be noted, have already taken solid shape.

By the way, I learn that Dr. Emerson is shortly about to leave his beloved East Anglia, where I believe most of his photographic work has been done, and from which he has drawn inspiration and material for so many delightful books that long ago won the esteem of nature-lovers, and intends living in Germany. English photographers will, I am sure, hope that this will not involve the total withdrawal of his valuable personality and influence from the world of photography. I am informed that some portion of Emerson's apparatus is to be offered for sale, and that he will content himself with a hand camera, for which, in his book, he has a good word to say as "a great desideratum for artistic studies." When these words were written, the hand camera was largely an object of curiosity and contempt, and it needed both courage and prescience to recommend it for "artistic studies."

The Pharmaceutical Society has, I learn, been successful in the appeal case against Mr. Hume, at Edinburgh, and the decision, I suppose, simply debars the use of the term photographic "chemist" by any but those having, as it were, the certified authority of the somewhat arbitrary and persecuting Pharmaceutical Society. The *Chemist and Druggist* has the following note on the subject of a recent reference to the matter that was made in these columns:—

"The photographers are making a rather undignified display of themselves in connexion with the recent actions in Edinburgh. The British Journal of Photography has a spiteful little note calling the Pharmaceutical Society a 'trade union,' and its proceedings 'raiding.' The Editor has been reading the Pharmacy Act, apparently for the first time. He quotes the section which protects the title 'chemist,' and says 'this will probably be news to a great many people.' If it was to him, he should not confess the fact. An editor ought certainly to be acquainted with the laws which are likely to directly affect his constituents."

My contemporary, of course, holds a brief for the chemists; but, for all that, the Pharmaceutical Society is as much a trade union as is the Amalgamated Society of Carpenters and Joiners, and its action in swooping down upon one or two photographic dealers for simply calling themselves "chemists" is one degree lower than "raiding," —it is paltry in the extreme. That a society can be found in this year of grace to put in force a foolish and unjust law, confining the use of the term "chemist" to any one class in the community, is not more marvellous to witness than is the spectacle of a presumably intelligent journal upholding and applauding a legalised anachronism, whether it be in favour of its own constituents or not. Still, both phenomena are before us!

I note the formation of a Society of Photo-etchers, which, though it is not a year old, has held an Exhibition of photo-mechanical work that, from all accounts, was not a success. May I remind the new "Society" that the Royal Photographic Society is making special efforts to provide opportunities for the discussion of photo-mechanical subjects at its meetings, that at its annual Exhibition great facilities are given for the public display of photo-mechanical pictures, and that, therefore, the establishment of a Society of "Photo-etchers" cannot possibly supply a long-felt want? What a lot of valuable

energy is wasted by this unfortunate tendency of photographic bodies to overlap and revel in the dim and microscopical glories of hole-and-cornerdom?

So poor Vernon Heath has passed away. He had a varied and, at times brilliant, career, and will be remembered for his very beautiful landscape work. I recollect, some years ago, looking through his series of, if I remember aright, the Royal Parks and Demesnes, and congratulating him upon having produced some truly pictorial results out of what were in many cases unpromising materials. I also had the opportunity of supplying him with a few materials for an unpublished book on photography and his own reminiscences, which, according to the synopsis he gave me of it, should make interesting reading.

I have received a little book giving particulars of the classes in photography that are to be held at the Polytechnic, 309, Regent-street, W., during this present winter. The fees charged are reasonable; there is scarcely a branch of artistic or technical photography that is not scheduled, special attention is paid to reproduction processes, and the teachers are, without exception, well known and competent men. That the Polytechnic has turned out some good photographers in the past I am entitled to infer from the fact that many of my personal friends who are ex-pupils are very clever workers, and I have therefore every confidence in recommending the Institution to those of my readers who may require, or know somebody else who requires, instruction *ab initio*, or in some special branch of work.

The amusing panegyric on albumen printing paper as a "marvellous printing method" by Mr. Bachrach, printed last week, reminds me of the story I was told of a well-known photographer who, during a discussion on amidol, metol, and others of the new developers, remarked that, if pyro were newly brought out now, instead of many years ago, it would be hailed as a remarkable introduction. "Why, cert'nly!" as Colonel Woottewell W. Wood, in that delightful comedy, *The Colonel*, used to say. COSMOS.

IRON IN PLATINUM PRINTS.

AT a meeting of the Croydon Microscopical and Natural History Club (Photographic Section), held on Friday evening, October 25, a paper was read by Mr. J. H. Baldock, F.C.S., on *Experimental Search for Iron in Platinum Prints*, Mr. J. Packham in the chair. "The *raison-d'être* of this paper, which we propose submitting to you this evening, finds expression, in the first place, in the process brought forward by Mr. Packham 'on the treatment of platinum prints,' and, in the second place, in the valuable and interesting paper by Mr. Chapman Jones on *The Changes that Platinum Prints are Liable to*, which was published in the *Royal Photographic Society's Journal*, for May 30, 1895, for a copy of which we are indebted to Mr. Chapman Jones.

"It is not our intention to-night to travel over such a wide field as Mr. Jones has done, but rather to determine whether iron is at all times existent in platinum prints, and whether the toning, staining, or dyeing, as it has been variously called, consequent on the employment of Mr. Packham's process, can fairly be attributed to such iron. Doubtlesss a very interesting inquiry is opened up, and, in all probability, further experiments will be made to elucidate, if possible, in what form the iron exists, and whether chemically pure platinum is or is not capable of forming some kind of combination with tinctorial matters. But we may say at once that, so long as the effect produced is *permanent* and *pleasing*, we do not see that it materially signifies whether that effect is brought about by the agency of platinum, iron, or any other metallic base.

"Through the kindness of Messrs. McKean, Roods, and Packham (members of the Society), we have had placed at our disposal a good number of platinum prints made by the hot and cold-bath processes, and also some on Pizzighelli paper, and we have submitted some of each to chemical examination in various ways. Inasmuch as platinum and iron were the only two metals present, or, rather, the only two at all likely to be concerned in the process, we have not gone through, and it is not our intention to-night to go through, the whole range of analysis for the separation of the different metals, but to confine our attention, as stated in the title of our paper, to the presence especially of iron.

"1. One way to detect iron was to boil a print in aqua regia, dilute with water, filter, add ammonia in excess, and then hydrochloric acid in excess, pass sulphuretted hydrogen through this solution, filter from any precipitate that might be formed (this would consist of platinum and possibly separated sulphur), and to the filtrate add ammonia in excess, and then sulphide of ammonium, and boil. This, if iron were present, would give a black precipitate of sulphide of iron (if in *small* quantity a greenish colour by transmitted light).

"2. Another shorter, simpler, and equally good method was to ignite a print in a platinum crucible until nothing but a white or greyish ash remained, boiling this with hydrochloric acid, diluting, filtering, and adding ammonia and sulphide of ammonium as before.

"We demonstrate to you both these methods, and the character of the precipitate obtained *by this means* forms one of the indications of the presence of iron. But one test is never relied on alone; consequently this precipitate is collected on a filter, dissolved in a few drops of hot aqua regia, the solution diluted, filtered, rendered alkaline with ammonia, and then *just* acidulated with hydrochloric acid. This solution may now be tested with ferrocyanide of potassium, when a beautiful blue precipitate indicates iron; with sulphocyanide of ammonium, when a blood-red colour indicates iron; and with tincture of galls, when an inky black, or, if very dilute, brown-black colour is manifested (experimentally demonstrated). It is hardly necessary to point out that in all analytical investigations, especially where minute quantities are concerned, it is absolutely essential to employ chemically pure reagents, and in the present instance to see that the hydrochloric acid used is itself free from iron, which is a common impurity in the commercial article.

"The prints to which reference has been made were treated in this manner, first entire, then the dark part of the print, and then the white (sky, &c.) parts, with the result that *in every case* iron was detected. Some more prints were then submitted to the action of ten per cent. *pure* hydrochloric acid for two hours (this is six times as strong as the acid recommended for platinum prints, which is 1-60, and to which weak acid all the prints had been submitted in the ordinary way), washed, and then two hours more in a fresh ten per cent. acid solution, and, after washing and drying, were examined for iron. The result was exactly the same as before, except that now the quantity of iron was very much reduced (shown experimentally). It would thus appear that it is next to impossible to remove every trace of the iron, which is not surprising when it is borne in mind how difficult it is to remove ironmould from linen, or to remove every trace of iron from old documents which have been written with an ink containing iron.

"One of each kind of print referred to was next moistened with water, and placed in a large wide-mouthed bottle, which was filled by displacement with sulphuretted hydrogen. The bottle was corked up, and the whole allowed to stand all night. In the morning the prints were taken out, washed, and dried, when they were *all* found to be stained brown on the coated side of the picture, further evidence of the existence of iron, as in the prints we show you.

"Thus it seems evident that the effect produced by Packham's catechu solution—and a similar effect is also produced by a solution of tannic acid, as in the print before you—is due to a kind of dyeing process between the astringent matter of the catechu or the galls, and the iron in the prints, the latter acting as a sort of mordant, the *extent* to which the action is carried, as indicated by the brown colour of the print, depending on the depth of printing partly, and also partly on how carefully as much iron as is possible has been removed.

"We think that we have demonstrated beyond a doubt that the iron which is always present, though in uncertain quantity, in platinum prints, certainly may, and as certainly is, capable of producing these warm brown tones with catechu, tannic and gallic acids, but catechu gives much the best results; at the same time it would appear from the investigations of Mr. Chapman Jones, as recorded in his paper already referred to, that platinum alone is also capable of producing similar, if not such pronounced, results; but the subject is an interesting one, and would well repay any one who chose to experiment further in the same direction."

At the conclusion an interesting discussion took place, in which the Chairman, Messrs. Merton, Holmes, Moss, Roads, &c., joined.

PICTORIAL TREATMENT OF LANDSCAPE.

[North Middlesex Photographic Society.]

I FEEL both honoured and pleased to have the opportunity of again addressing you, though the task has not become an easier one. The last time that I was here I spoke on a few simple matters of com-

position, and selection, and the like, which, judging by some of your work which I have since seen, must have been as familiar to you as to myself.

I have had the pleasure of seeing several of your exhibitions, and, though at each I have seen some work that it seems difficult for its producers to surpass, yet there is apparent a decided improvement of the work *en masse*, and last year I brought away with me a very pleasant recollection of having seen an interesting exhibition, in which bad taste was most delightfully absent. To-night I shall endeavour to again touch on the subject of picture-making, though on somewhat subtler lines than before. As you will, no doubt, readily grant that any subject connected with æsthetics must of necessity lapse somewhat into vagueness at times, perhaps you will as readily pardon me if my meaning is not quite clear, or its bearing upon photography not quite apparent.

I don't think there is any necessity to define in any way the phrase "pictorial treatment." We all feel at once, when anything strikes us, as being a picture, though perhaps our ideas on the subject of what is picturesque are widely divergent. It would be difficult indeed if two views were placed before us of the same place, one literally, the other poetically, treated, to say why one should be finer than the other, or sometimes almost impossible to point out wherein one differs from the other. We might talk about composition, but that is not the only factor in the making of a picture. One might make very excellent pictures, and think very little about composition. Some artists have made fine pictures, and have broken the generally accepted laws of composition.

It was once said of Courbet that he could make a picture out of a broom handle. I don't know whether such an object would lend itself readily to composition, but the power of the man to please with subjects that seemed awkward in arrangement was very wonderful indeed, and ever through his work there floats that indescribable charm that proves the poet. I think, though, that in the artist I have named there is somewhat of an affectation in the choice of some of his subjects, an affectation that was visible enough in the man himself. He was an artist, though, in spite of this—not by means of it. Still, there are those who, being a law unto themselves, trouble not about the laws made by the many, as Horace says of Pindar "numerisque fertur lege solutis," and is borne on in numbers, exempt from rule; but, whatever of law they break, it is only in obedience to higher law within themselves which triumphs over the crystallised and somewhat narrow, though useful, rules by which *we* live; there is a vast difference, as Thoreau says, between the bison roaming the prairies in freedom, and the cow kicking over the milking pail and jumping the farmyard wall. So we must trustfully look at many of the masterpieces of Turner and others, which seemingly break the accepted canons of art, and art must expand her rules. Looked at from some standpoints, perhaps these departures from rule may be the very highest forms of composition.

Still, to come back to my point, there are many pictures wherein the ordinary simple and safe rules of arrangement and grouping, which we commonly call composition, are missing; yet none doubt the claims of such pictures to be works of art because of the pleasure that they impart. I want you to see, though I have gone rather a roundabout way to it, that there is something in a picture; something that is not in its arrangement altogether, nor in its colour, nor its technical merits; a something that, however difficult we may find it to define or point out to others, still is the most important thing in that picture—its essence, its very soul. This *is* the picture, it is this that shows the artist behind. I suppose, for want of a better word, I must use the rather vague term, "feeling," and it is this feeling that I shall try to say a few words about to-night. But stay, if a certain great art critic is to be trusted, who wrote a short time ago such a sweeping criticism in the *Daily Chronicle* that I almost expected that photography would have disappeared off the face of the earth, and that the North Middlesex Society would be no more—if this critic is to be trusted, this feeling is just what photography cannot render.

I fancy the aforesaid critic is one to whom art means a very little club or coterie including, of course, himself—and even then perhaps he bears some resemblance to that pious old lady in the Scotch village who, when asked how many were the elect in the parish, thought there were but very few, which shortly fell to herself and the parson, and eventually, when questioned a little more closely, she confessed to having her doubts about the parson—this sort of spirit looks very mean in art which is as a great field with the gate left open where all may go and dig and delve and find what of gold they are able to, and, if any club of photographers thought that they had an exclusive right to the name of artist, they were as much at fault as the gentleman who wrote the criticism, who falls into very much the same error—all may go and search for the beautiful and find it if they can; still, on certain roads where the great have travelled, there is not much left to be picked up, and when our good friend the critic a few years ago, during the Whistler Exhibition, made the statement with regard to a little slight but beautiful study, that it contained that note of blue which Turner had in vain tried all his life to get, he was uttering only one of those sentences like the one about the margarine and the cow in the *Daily Chronicle*, one of those little sayings that look so smart in the printed page and serve to fill up. There is room enough for Mr. Whistler and all other artists both great and small. But don't take the same path that the great Turner took, for the blackberries, I'm sure, are all picked on that hedgerow. I think myself that undoubtedly the artist may make himself felt in photographic work, and I fail to see the rival claims of picture painting and photography; are they, for instance, aiming at quite the same mark? if any one here thinks that they may at any time produce a work of art equal to a Turner or a Constable or a Corot, it's not for me to contradict them, they will find it all out for themselves, they will discover limitation enough in their craft to stop them rising to such heights; the absolute sway of the great artist over nature is only gained by a life of servitude and obedience, it is "that service which is perfect freedom;" the mere knowledge of drawing that Turner possessed has never been surpassed, it is shared in figure work by such consummate masters as Leonardo or Michael Angelo; it took a great genius to acquire it, and yet it was only the grammar of his poetry. As it is with drawing, that is to say, the delineation of form, so is it with colour and with composition, and it is these difficulties, to be passed only by nature's chosen few, and that by the putting forth of all their strength and all their love, ay, and their life itself, that lifts up art and her great prophets to tower above men and be the wonder of the ages, so that, even when their work has passed away, their names may be remembered. Men have not forgotten the name of Apelles, the Greek painter, it lives, though his work is only as the dust of the hand that made it.

As art is not the copying of nature but the true reading of hidden truths, that art which gives men the greatest liberty of treatment must, of necessity, be the highest. Turner in his great pictures is seldom topographically correct, but is true always in giving the impression that nature produced upon his mind. Some Alpine steep or Yorkshire crag almost of humble dimensions speaks to him of grandeur, and grand they shall be and tower up to the very clouds until they repeat to men nature's message to him. A great painter tosses mountains and seas and cities about like a juggler does a ball; it is this power that makes art wonderful. Of course I need not point out that the painter's scope in this direction is more open than that of the photographer.

The artist in photography does not start with these tremendous difficulties to be overcome, still I myself think the photographer can soon prove himself artist or not, as the case may be, and may produce beauty that shall please and teach just as an artist should; and, once having granted that there are limits to his work, I should be the last one to fix them, for the growth of artistic photography, during the last ten years, has been tremendous, and it is still sweeping forward, bent on new conquests. And now, after having said all this about things in general, I think it is about time to get back to my own subject, which, as yet, I have not touched. The artist deals with outward forms and appearances, but uses them to express inner truths—he sees to the very souls of things—this, I know, is not admitted by many who think that art is something to be cultivated for its own sake and has *no lesson* to teach. To-day, many men are striving and grappling with certain problems, with very little idea beyond the solving of them, that is to say, they expect to deduce nothing from such quest—how many men to-day are seeking to paint light; but look at Turner, who could paint it ebbing or flowing, or flooding a whole landscape, look at *The Birthplace of Wycliffe* in the Yorkshire series—it is early morning, the sun, strong in the heavens, has driven the night and its mists away, the deep sublimity of morning becomes deeper still, and gets a meaning when we think of Wycliffe as the dawning of the Reformation's day. This is no chance, this sun rise behind the hill, the artist meant something. Such deep meaning runs through all his work; you may, if you have read stories about his life, call him rough, uncultured, ignorant, as you will, but he was nature's man, and he knew her great heart; and though, with his short, broken talk, he was powerless to express himself, yet with a brush he taught always the same truth. That some particular message ran through his work is evident from the care he took, and his insistence on keeping his work all together—to him all its stages were one thing, it was a whole. I think the great teaching of his work was the close connexion of human life with that of nature, perhaps the sadder side of human life. Nature to him is a living thing, and man and nature blend; in everything he reads a meaning; to the

landscape painters of the past, whether religious or infidel, it was only a dead machine. Turner represents in art the great philosophy of Goethe and Emerson, who were the spiritual sons of the deep dreaming philosophers of India and of Greece.

You may think this very highflown and metaphysical, you may say of our great painters that they were artists and nothing else, but consciously or unconsciously they obeyed the voice of nature—art must look for meanings, it is only intense sympathy with nature that ever wins her secrets. What is behind appearances? Is there any meaning in things? Is a picture only a few harmonious dabs of colour, a warm patch here, a cold one there? These questions, though they may seem to people only as the thin air, *have in them the very foundation of art.* To-day, so many men, all over Europe, men with true eyes and sure hands, are doing nothing better than experimenting, straining every nerve to paint something that when it is done says nothing. I maintain that it is this deeper seeing that I have been speaking of, this belief in, and attempt to express a meaning in nature, not seen of the many, that the great glory of Turner's art consists, and it is this that makes him the greatest exponent of pictorial treatment of landscape; everything that Turner touched was a picture, and, as this applies to the great compositions of his strength, so does it to the weakness of the young artist standing in the fields, sketch-book in hand, for the first time, or the young photographer with brightly polished camera and half a dozen plates to spoil. What you go to see you will see; if you go aimlessly, things will look aimless, but, if you look for purpose, purpose you will find; the more insistence there is on the close connexion between man and nature, the better and deeper the art.

Here is something that is pictorially treated in the truest sense, this view of Stonehenge, is the picture here only formed by a few forms, or grouping of forms, a light here, a dark there, in pleasant juxtaposition? I venture to think not, though there are many artists of great power who limit art to such scant bounds, and it is the fashion in this sneering age to laugh at Mr. Ruskin for some of his beautiful analyses of Turner's drawings; some people think that he fancies things the artist never meant. I think less is seen, not more, of what the painter intended; but, whilst men are laughing at work full of the deepest meaning, any aimless scrawls, if they be gross enough and fantastic enough, are so bepraised, that when the artist grows sober, for I always imagine a great deal of the new art proceeds from that curious disease briefly called D.T., he would not be able to recognise by the description his own work. All that I have claimed for Turner is to be found too in different degrees in the other painters worth calling great, it is certainly missing in a painter like Claude, who claims our respect only for technical power; he is great in making paint glow, something to be respected though, for nobody else save Turner, sometimes, has beaten him; but there is something that like the scent in the flower is missing, and we turn to Richard Wilson, a man of infinitely less power, though composing pictures on very much the same lines—we turn to him with pleasure and with interest.

I can't tell you why, except in very vague terms, indeed it is this feeling again, that which is so difficult to talk about and yet is the thing most worthy of being talked of. But to come back to our Stonehenge. What do you think is the chief interest about those old stones, what is there of beauty in them? to many the only thought that would occur would be that of our great and intelligent king with regard to the apples in the dumplings, how the devil did they get there? but their real impressiveness must consist in their having stood *so long;* rough as they are, they have a grandeur of their own, not to be beaten by many a famous stone which the hand of the artist has carved into beauty, it is their strength, their lastingness that is so impressive, they have resisted the long eating years; so Turner makes the storm rage round them in vain, but the transitoriness of the men who raised them, and of all human life, is shown by the shepherd stricken dead by the lightning. I need not point out to you what intensity of feeling there is in the dog howling by his master's side, and the ewe with her twin lambs, one of which is unconcernedly sucking its milk, as the mother smells the dead body of the other—all this is pictorial treatment enough, I fancy, and this print, mind you, is only one out of a large series—the *England and Wales*—containing views in every part of our country, and yet in every one of them there is this deep feeling apparent. Let us take another, *Malmesbury.* Here the aim of the artist is peace, not as in our last one storm and grandeur and strength: the old abbey, catching the last glow of the day, has no strength of Stonehenge about it, it was raised by gentler hands, and time has had its way with it. There is a feeling of delicious evening calm here—the quiet little valley with the cows waiting patiently to be milked, whilst the milkmaid suffers herself not unwillingly to be courted by her rustic lover, but not unobserved, for down the little lane come a boy and girl who will no doubt tell a fine story of all her goings on. This picture of the old town, with the evening sky gathering dark above its ruined abbey and quiet homes, must convey to all a sense of deep peace that in these restless days is full of balm. This beautiful work was all done when men were scorning the beauties of their own land, when the brown tree of Art grew in every studio—and nowhere else; when men raved over anything that was suggestive of trick and skill, and knew not truth; what a lesson here to us all, so much beauty and dignity from simple things. I always feel that in photography the best successes are to be got from simple material, simple in massing, simple in detail, simple in feeling, some of the great triumphs of the past were begotten of very simple things; then, too, the artist is never better employed than when showing men the beauty of humble things right close to their own life. Restful, again, is this drawing of Brinkburn Priory in the North country, how every touch here tells the story of quiet, uneventful country life—every ripple in the quiet pool, the straight rising smoke, the boys fishing, the old Norman abbey, the light falling through the trees on the bank. I am not talking about drawing to-night, only I feel that I must call your attention to the noble rendering of those trees on the left-hand bank, and to the wonderful drawing of the right-hand side too, with every form of earth and rock and covering grass all so faithfully made out; but I suppose this is not in our province, let me just again note what a wonderful part everything here plays, to tell you what the artist meant you to feel. Can you not imagine Turner himself as a tired traveller following the windings of this stream by pool and rock and rushing fall, till his eyes fell on this calm scene, and he could go no farther till its beauty was captured?

This wonderful drawing of Langharne with its wild sea dashing in, bearing the broken wreckage with it, the castle, though ruined, still strongly upright, the story of its struggle with the sea winds written on its face—but it is builded on the rock and so endures—and then the sun finding loopholes in the clouds and lighting the distance up, what charming contrast. Again, another sea piece; only the stormy sea brings this time not merely wreckage of man's work, but a corpse, a wreck of life itself; here is tragedy again. Can one look at this, without feeling the great eternal strength of nature, as this limp corpse is hurried by to be cast like sea wrack on the shore. To pass from this stormy scene to the peace and calm of the *Frosty Morning* shows us some of the depth of Turner's genius—here is a picture that in every particular seems but little lifted above the commonplace, and yet it it one of his most poetical. Here is the something that, as I said in my introduction, is so difficult to locate; to explain the deep charm of this picture wants better words than mine, and even then I doubt if these things are to be explained. For years I have been a regular visitor at the National Gallery, and every visit shows me more of the beauty of this great work. I shall not attempt to analyse it, I show it to you to-night as an example of what can be done with humble materials if the heart be behind the eye that looks on them. I am purposely abstaining from showing you any of the work that may fall under the heading of Turneresque, all that I show you differs from the work of other artists only in intensity of feeling and depth of knowledge. In this view, on the Thames, all the charm is in the sympathetic treatment. Other people might have gone and seen something like this, though they could not have painted it. Not yet are we to have the glow and glory of the Ulysses deriding Polyphemus, or stately Carthage bathed in golden light, or old Téméraire gliding ghostlike up our river, or any of those miracles of art which we associate with the name of Turner; yet here is our own English country, and the example I have just passed you, seemingly without much alteration, painted as men had not seen it painted before. This man sought with eagle eye throughout the whole realm of nature, looking for her meanings; he saw the same story of perfection in the humblest roadside weed as in her mightiest works; he scorned nothing, but learnt something from all.

In this view of Dudley, even amidst our modern befoulment of nature, he finds beauty; the ruined castle, part of the old England looking down upon the new, with its factories and forges, and smoke, and livid flames, change and growth, old times and new, contrasted; but the constant moon, rising as ever, throwing its light on the new life as it threw it on the old; surely all this is pictorial treatment in the very truest sense. There are a few more examples that I will pass on to you without further comment of mine. I will read you a few words from the pen of Mr. Storey, now a well-known artist, written some quarter of a century ago, when as a young man he made a pilgrimage to Petworth to see the Turners there; he is describing an evening walk. "Such scenes," he says, "teach the artist something of the deep soul of nature which, unless he can get at, his pictures, are but worthless, cold, material pieces of cleverness, forgotten as soon as left, admired perhaps, but never loved."

"I remember noticing two drawings of the same old castle (I forget

which), one by Turner, and the other by a very ordinary drawing master. The latter had painted it in its every-day reality, and we turned it over at once. But the other was by Turner; he had gone down to the other side, where there was a river; he had gone there when the calm light of evening was lying along at the back of the black ruin; the waters were still; the sullen walls were reflected clear and deep in the stream; the castle itself towered high above, and one seemed to look up to it with reverence and with sadness. The day departing, the strong walls broken down by time, and the deep, still flowing river, flowing on through the dark night of the future, made me think of the littleness of every-day life and the greatness of that other life that only the soul can understand. And all this beauty, all this solemn majesty, depended on Turner's choosing his time and his place, and on his feeling that the sentiment of nature was her noblest attribute."

I like all this because I felt, when I read it for the first time, that it voiced my own thoughts, for it is what, in a bungling way, I have been trying to express here to-night. It is such feeling as this, such looking beneath the surface, that separates the great schools of painting from the schools of merely wonderful technique; it is the difference between a Titian and a Teniers. An amateur artist and a friend of Turner, who was well known to the other artists of his time, said of Constable, that his great aim was breadth, tone, and moral sentiment; that moral sentiment I take to be the painter's own phrase, for it seems to have rather a strange sound to the writer, though the great modern criticism of Mr. Ruskin, for it is *great* in spite sometimes of its narrowness, is founded deeply on the perception of such sentiment in the work of the artist; it is this feeling that marks the difference between rhymster and poet, and applies equally to every expression of thought in any medium. Curiously enough, in the same article that I have just been quoting, I came across the following words, witten a good many years ago, which serve somewhat as a criticism of the photography of the day, and which seem *apropos* often enough now. He says: "It has been well said of photography that it strikes nature dead." I think that is often one of the reasons why many a photographic picture does not please, especially the older ones, though I think that deeper study of nature, and truer and more artistic feeling have produced work that does not lie open to this charge, for I have seen work within these walls that has struck me as being intensely fresh, and I live enough in the fields to be severely critical on such a point.

Now, gentlemen, I was announced to come here to speak to you to-night on the pictorial treatment of landscape; if my words have not had that bearing on your work which you anticipated, I must ask your forgiveness. I feel sure that you follow up your beautiful study in the spirit of artists, and as such I have spoken to you, on a question that may not seem to bear directly on your own work, but that to me seems to affect most vitally our art of to-day, a principle that, in this time of commercialism, is sneeringly set aside by many of those to whom truth of eye, and cunning of hand, and power of expression have been given, but given in vain.

The age is drifting into insincerity, and art soon catches such a taint, we are like children well pleased with trivialities, and many men no longer, for very fear of rebuke, dare to look back in admiration to those who in the past earnestly sought for truth, but degrade art to a raree show, and the artist to a mere juggler—novelty is what men ask for, something fantastic and strange, be it ever so ugly.

Of course, I do not say this of all our work; there is art in England to-day worthy to rank with that of any age, though every now and then in the past in some particular branch of art, a high-water mark has been reached that, as far as human judgment can decide, seems impossible to be passed; yet, when a few quick years have passed, and men can look back from a little distance on this age, which is ours now; when they shall see that which, for very nearness, we cannot—no doubt, the latter part of the nineteenth century will be found to have done its part, and added its stone to this great structure of human art. But we must measure the strength of a nation, not by its great few only, but by the rank and file also; and, though, I cannot pretend to judge how far we have gained since efforts have been made to popularise art, yet I cannot help seeing the many dangers which surround us. It is with some such feeling that I have ventured to wander so far from my subject to-night; I must confess my position is something like that of the preacher of whom it was said that if his text had had the small-pox he would never have caught it. Then, too, I have spoken only of one man's work, and of that you may think too often. I chose Turner because even amongst our great landscape artists he stands out supreme, and because I think that no artist in any age ever loved nature with deeper reverence or served art with greater singleness of purpose—whatever his failings, his sins, his ignorance may have been; all those who knew him best have left their testimony to the heart of gold that was hidden under his rough exterior.

He is England's man as is Shakespeare, and when this great smoky city of ours shall decline, as all other cities have, then its claim to remembrance shall be not in its riches or its glory, but in the names of the great who found in it a birthplace or a home, or wandered unnoticed amid its busy streets, and chiefest among these the name of our great painter. The massed wealth, and the luxury and the busy mart are but transient things; but time deals kindlier with the poet's fame, for the truth, be it painted, or spoken, or sung, cannot die, as an old poet sang once, "Non omnis moriar, multaque pars mei vitabit Libitinam."

"I shall not wholly die; some part—
Nor that a little—shall
Escape the dark destroyer's dart,
And his grim festival."

H. A. Mummery.

THE TINTOMETER.

At the offices of The Tintometer (Limited), 6, Farringdon-avenue, we recently had an opportunity of studying some of the innumerable uses to which the highly ingenious principles upon which the application of this instrument is based may be put. The tintometer, we may observe, owes its inception to Mr. J. W. Lovibond, of Salisbury, who introduced it some seven or eight years ago, and not only used it in his own business of a brewer, but, we believe, has since had the satisfaction of seeing it adopted in many other industries.

The tintometer is perhaps best described as an instrument for measuring and, so to say, analysing the colour in solids and liquids. This is done by placing the object or sample at one end of a suitable instrument, and then, from a "graded series of standards, made of coloured glasses, numbered according to their depth of colour," matching, as it were by synthesis, the colour of the solution or solid under comparison. The standard glasses have each their assigned value in the scale of colour, from which it follows that it is easy to record and repeat the specification or formula for particular colours to an almost illimitable extent.

For investigation work three colour scales are necessary—red, yellow, and blue, and the glass slips are graded in colour depth from (virtually) plain glass to maximum intensity. The tintometer consists of a double, parallel-sided, wooden tube, ending in an eyepiece at one end, and in equal apertures for viewing the colour to be measured, and the glasses used as measures, at the other end. Provision is made for the equal illumination of the colour to be measured and the standard white or reflector, from which the light is conveyed to the comparison tube; and also for the easy adjustment of the glasses used in the measurements. It also avoids the side lights (falling on the eyes), which often render the critical estimation of colour, under ordinary conditions of observation, absolutely impossible. A monocular instrument is also provided, where liquids placed in a trough are to be examined.

Dyers, paper makers, steel manufacturers, maltsters and brewers, oil refiners, wine growers, chemists, millers and flour dealers, to quote a few from an extensive list, have found the tintometer effective and useful in the colourific measurement of the various products with which they have to deal. In photography it has an obvious application in the determination of the exactness of colour and depth of the inks used for three-colour work, and it is believed that it will be available for employment in the Hurter & Driffield system, or a modification of it, of determining the speed of plates, the colour measurement of the standard light and the densities of the negatives being possibly within its grasp.

The resources of the tintometer are very great, and we shall watch with interest its development for those uses—and they are probably more numerous than those already mentioned—which photography provides for it.

THE STABILITY OF PRINTING-OUT PAPERS.

[Photographic Times.]

The following is an extract from a letter which I received a few months ago from Dr. James Johnson, of Jamaica, West Indies:—

* * * "You will please give me your opinion on, viz., Collodion *versus* gelatine printing-out papers. Which do you think the most suitable for this climate, and on the question of permanence? I have beside me a matt-surface picture you so kindly sent on board steamer for me last year. These were mounted, but half a dozen in the parcel of rural scenes, glossy surface, have changed in such a remarkable manner that I thought it well to enclose three of the prints, as, of course, it is important that the cause of the fading should be discovered."

The prints which Dr. Johnson referred to were printed in the winter of 1893 on collodion paper and toned and fixed in one solution. I

remember the day distinctly on which they were printed, and have in my possession a number of prints mounted and unmounted which I finished at the same time. Those which I kept are in their pristine condition, but those which I sent to Dr. Johnson, and which he returned to me, had faded completely in the high lights and the shadows turned a light olive green. Immediately on receipt of Dr. Johnson's letter I attempted to make a careful analysis of the substance contained in the film of the paper, but found that this was not feasible, and the only conclusion I arrived at was, that there was a trace of sulphur or sulphide left in the film. For a month I exposed one of the prints in my possession which I had not sent to Jamaica, and another one I exposed similarly, moistening the film every day. In a short time the one which was moistened turned the same way as the prints which Dr. Johnson returned to me, but the other one, which was kept dry, altered but very little. I made a very careful examination of one of the prints that had not faded, and also found a trace of sulphur or sulphide in its composition. The inference is that the humidity of the atmosphere of the West Indies is greater than that of the temperate zone, and that Dr. Johnson having had my prints more exposed than the ones which were in my possession caused them to alter much more rapidly than they would have under ordinary conditions. The serious question, however, is whether collodion or gelatine papers are as permanent as albumen paper. I would not like to sit in judgment on the collodion papers because they are far more convenient, as every one knows, than albumen paper, still I am positive in my belief that the combined toning and fixing bath is deleterious to the permanence of the albumen paper. A number of prints which I made more than three years ago are still in perfect condition, and when one comes to consider that paper itself is not permanent, and will first bleach and then become yellow in sunlight, it is not to be expected that manipulated papers are permanent. A trace of hyposulphite of soda or of silver, which is so infinitesimal that its quantity cannot be determined, is enough to destroy the lasting quality of the silver print. The great objection to the modern papers, with one exception, is the fact that they will not stand any heat over 70°, because it is advisable, under all circumstances, to wash in warm water where warm water can be used, as its power of solubility is greater than cold water.

Almost every manufacturer of collodion and gelatine paper, in the printed directions accompanying each package of his paper, deprecates the use of the combined bath. In fact, some of them say that the combined bath is not permanent; still, because other manufacturers give a formula for a combined fixing and toning operation, they do the same, to the detriment of their own paper. There is no question to my mind that the combined bath is a failure as far as the stability of the print is concerned, and manufacturers for their own good ought to stop recommending it. The chief difference I find between the collodion and gelatine paper and the albumen paper is the same difference which distinguished wet plates from dry plates. The wet plate after having been fixed was washed a few minutes, and the dry plate has to be washed in running water for an hour because the film is much thicker and capable of holding so much more fixing salt. As far as my tests go, collodion and gelatine papers are all right, and have come to stay, but they will not be adopted by all the photographers until they learn that they need much more careful washing than the albumen paper does.

I call to mind a case of my own which occurred some twelve years ago. The photographer with whom I was employed received an order to photograph the ruins of a fire for an insurance company, and the day on which we made those prints we washed them in about ten changes of water, and then left them in the last washing over night. The insurance company framed the prints and exposed them in their office window, and there they have been ever since. Last year I happened to pass, and saw those albumen prints, which had been in the window for over ten years. The high lights were as yellow as beeswax, although the details in the print had not faded at all. This simply goes to show that the average well-washed albumen print is not any too permanent, partly because the paper itself is not permanent. I have heard it remarked by a photographer who had gone back from gelatine paper to albumen paper, that he had to reprint over 700 dozen prints, which had faded last year, and that he was not likely to go back to gelatine paper again. Such prejudice will have to be lived down by the manufacturers of the paper after they have given up the complex formulæ which they recommend, and after they will recommend a thorough washing for their papers.

The conclusion I have arrived at is as follows:—First, combined toning and fixing baths are positively useless and derogatory; secondly, collodion and gelatine papers must be manipulated exactly like albumen prints, excepting the final washing; thirdly, they must be washed in running water at least four hours, and they must not be allowed to remain in the last wash water long, if they are not washed in running water. As to the relative merits of the various papers now on the market I can only say that those which stand a degree of heat in manipulation from 70° to 100° are better than those which must be used with ice.

Dr. Maximilian Toch.

THE PHARMACEUTICAL SOCIETY AND PHOTOGRAPHIC CHEMISTS.

In the Edinburgh High Court of Justiciary, on Saturday, judgment was given in respect to the appeals arising out of the recent prosecutions in Edinburgh Sheriff Court at the instance of the Pharmaceutical Society, and made by that Society. Lord Trayner said he felt the decision in the case of Hume to be attended with difficulty, but he had come to be of opinion that the appeal should be sustained. The statute respondent was charged with having contravened was passed "for the safety of the public," and forbade any one keeping open shops for the retailing of poisons, or assuming or using the title "chemist" unless qualified and registered as the statute provided. The respondent had assumed and used, both as a sign over his shop door, and on his trade circular, the title "technical chemist," but he maintained that the title so qualified, taken along with the fact that in direct connexion therewith he designed himself as a scientific instrument maker, was not within the statutory prohibition. He (Lord Trayner) thought it was. The public were more likely than not to regard the title "chemist" without paying any attention to, or perhaps understanding, the qualification "technical." That the prefixing of the qualifying adjective did not take the person using such title out of the statutory prohibition had been decided in England, where "botanical chemist" and "shipping druggists" had been treated as contraventions of the statute, the persons using these titles not having the statutory qualification to assume the title of chemist or druggist. Had these English decisions been to the contrary effect, he would not have dissented from them; they would even have been more in accordance with the inclination of his own mind. He was, however, not questioning their soundness, and it was not desirable that an Imperial statute should be interpreted differently in different parts of the kingdom. He was prepared to follow them, and decide accordingly against the respondent. In doing so, he was doing respondent no wrong, nor even putting him to any serious inconvenience, while only affording to the public the protection which the statute intended them to have.

For the reasons given in the case of Hume, he was of opinion that the second question in the case of Turnbull (using the word "chemist" unlawfully) should be answered in the affirmative. With regard to the first question (keeping open a shop for the retailing of poisons, &c.), he differed from the view taken by the Sheriff Substitute, and would answer it also in the affirmative. The shop in question was certainly kept open for the sale of poisons in small quantities. That the actual sale was made by a shopman or servant did not affect the question, it being part of the shopman's duty or service to make such sales, and what he did within the ordinary scope of his employment must be regarded as the act of his employer.

Lord Young said he appreciated the difficulties of these cases so much, that the inclination of his own mind—and he should have acted upon it had he been alone—would have been not to interfere with the judgment of the magistrate.

The Lord Justice Clerk said he had no vote in this Court unless there was a difference of opinion. He understood Lord Young assented. He expressed his own concurrence with the opinion of Lord Trayner, adding that both cases were struck at by the Act. Even without the cases in England, his answer would have been to the same effect.

Mr. Salvesen, for appellants, said he would not ask for conviction or expenses against either party.

The Lord Justice Clerk said it was better not to. They ought to say there was nothing whatever against the character of these gentlemen. It was only technically that the Court had come to its conclusions.

If it be true that peace hath her victories as well as war, it is also true that peace has victories almost worse than defeats. It is a victory of this distressful, if not disastrous, kind which the Pharmaceutical Society has gained in its appeal against the decisions of Sheriff-Substitute Sym in the cases of Messrs. Hume and Turnbull. The Justiciary Appeal Court practically, and almost woefully, tells the Pharmaceutical Society, "You were quite right to do it; at least the English Law Courts think so; but don't do it again." When the voice of the Pharmaceutical Society, in the person of Mr. Salvesen, began to "roar you like a sucking dove," and professed a fine virtue of forbearance in not asking for conviction or expenses against either party, the Lord Justice Clerk significantly advised him "he was better not to." In language of equal simplicity and candour, the Lord Justice Clerk, Lord Trayner, and Lord Young insisted that their decision was a purely technical one. Lord Young characteristically went so far as to declare that, had he been sole Judge and left to judge according to his own interpretation of what was justice between man and man, he would have adhered to the finding of Mr. Sym. We hope the Pharmaceutical Society is satisfied with its money's worth; it has paid for its lesson, and if it is wise it will not need many more. Messrs. Hume and Turnbull leave the Court with the Lord Justice

Clerk's emphatic commendation, "There is nothing whatever against the character of either of these men." The Pharmaceutical Society leaves the Court with an intimation that it has been using legal technicalities to gain its own selfish ends—playing the double part of pettifogger and tyrant. A society that thought a little more of its dignity and a little less of its ducats would not apply to the interpretation of the law under which it enjoys exceptional privileges and performs exceptional duties the methods of the jerry lawyer, who applies to law the unprincipled principles of the jerry builder. No one who realises the dangers to all national interests that lie latent in the theory of Local Veto will do other than thank Lord Trayner for his dictum that "it is not desirable that an Imperial statute should be interpreted differently in different parts of the kingdom." His meaning is plain; though his words are not accurate; for Scotland is not the same kingdom as England. But Scotland is one of what we may call the "home kingdoms" of the Empire, and if, with its vastness and its variety, it is impossible to obtain legislative and administrative uniformity for the Empire, it is worth while sacrificing many things (and many things have been already sacrificed) to obtain this uniformity for the "home kingdoms." But nothing is so alien to the spirit, more antagonistic to the aims, of this effort after unity than the reading of laws in a purely technical sense. No society, no corporation, intrusted by the Imperial Government with duties affecting any class of public interests, should perform them without full and generous regard to all other interests that overlap or interlace. And, if the interest be in the main a new and a developing one, the full importance of which could not (except by means of prophecy) come up for examination before the legislative assembly which passed the enactment, so much the more careful, and cautious, and considerate should be the action of those who perform the special duties and enjoy the special privileges. If the photographic chemists—Messrs. Hume and Turnbull and their fellows—are no longer entitled, without infinitesimal breach of law, to call themselves what they actually are, and must, in the material necessity of things, continue to be, we and the world at large are still free to be accurate in our nomenclature. By the technical tyranny of the Pharmaceutical Society, these honest purveyors of *materia photographica* are obliged to find some simple form of words which is technically without the Act to describe the trade of the technical photographic chemist. The task will not be such a difficult one. And perhaps it need not be undertaken at all, for the Pharmaceutical Society must be reminded that there is such a thing as "amending" the words of an Act of Parliament when the highest Court of the land (we are not using the words technically) convicts in opposition to its convictions.—*Edinburgh Evening Dispatch.*

THE PRINTING AND TONING ROOMS.

[Paper read at the Canadian Convention.]

Mr. President, Ladies, and Gentlemen,—I am going to ask your indulgence for a few minutes on some very plain talk on your most-abused and ill-used department—printing and toning, or, in other words, the printing and toning rooms. I say your most-abused and ill-used, because you give it your least attention, and, at the same time, expect the finest results—the finished picture. The old saying, "A carpenter is known by his chips," can be applied to the printer, for by the finished print you can tell the workman. We all have our individualities about our work, but it should have system. On the lower deck of a large steamer in my earlier days I once saw this sign, "A place for everything, and everything in its place." It made an impression on me that I never forgot, and I think that motto should be placed in every printing and toning room, and the theme carried out. Don't make them a dumping ground of the gallery. *Keep them clean.*

The average printing and toning room to-day is literally stuffed full of old boxes, bottles, jars, pots, broken glass, negatives, &c. *Clean them out*, and leave nothing that will catch the dust or accumulate dirt, and insist that rubbish be thrown out of doors. Have a rubbish box, and see that all rubbish is thrown into it, and insist that the box be *emptied* every day. Just try it, and you will be surprised what a difference it will make in your work; 'twill have a cleaner look in your eye—act as a caution to warn you of the impending danger of dirt.

The printing room of your gallery should get as much attention from you as any other department.

The average photographer seems to think that the printing can be done in most any place, and that the printer can get along with anything. You seldom find a printing room with a changing room or the proper facilities for "setting up" a negative, where prints can be examined or trimmed, or paper cut without being exposed to the light in some way. With the limited means he has to work with, your printer is bound to get careless and indifferent to his work.

Light-tight boxes or drawers for holding your prints after printing should be provided; a small one for cabinets and smaller prints, and a larger one for all sizes above Paris panels; these should be lined with dark cloth, and have a cloth flap that will exclude all light. The first print off should be marked on the back with a soft pencil, the style of mount and number of negatives, and all subsequent prints numbered to save handling. Putting prints in books after printing is not a good plan, as most printing paper used in these books contains more or less hypo of soda, used for bleaching, and not thoroughly washed out. Then, again, after continuous handling they become soiled from dirty fingers, and, as all printing papers are sensitive, you cannot be too careful. *Do not handle prints after they are printed.* A printer should insist upon this, and not allow others to handle them, for he alone is responsible for the cleanliness of his work. You cannot handle prints without the fingers coming in contact with the film side, and greasy, dirty, or sweaty fingers will surely leave their marks, and sometimes not only the print itself, but others, will be ruined by coming in contact with it. Carelessness is the motto of a good many printing rooms to-day. You may be ever so good an operator, make finely posed, nicely lighted, fully timed, and perfectly developed negatives, poor printing and toning will kill your work only too easily, for by the finished print the public judge your ability, and it is that they pay for. Provide your printer with what he needs to work with, and see that he uses them. Don't give him a monkey wrench, or bar of iron, or an old pair of shears, to drive tacks with; get him a tack hammer with a good claw for lifting tacks—they only cost ten cents; provide him with tissue paper, paste, opaque, and a brush to put it on with, and, above all, a duster, and a good one; tacks, and some soft pastel in sticks, a plate of glass, a pair of good shears, and, above all, good trimming glass patterns.

Have a changing table or bench large enough to accommodate all or most of your frames, curtained off, and proper shelves underneath to store away the frames when you are through printing; and, when an order is finished, take the negative out of the frame, and put it in a case or envelope to save it from being broken or scratched. So many negatives are broken by being left in the frames and uneven pressure left upon them. You seem to forget that negatives are only glass, and glass will not bend, but will break, oh, so easy!

I would advise ground glass for the printing room. Of course, it is a little expensive, but the effects derived from its use more than pay the slight difference in the cost. At any rate, print in subdued light, then you get the full value of your negatives.

I would also advise plain printing. Of course, it is quite necessary to have clean negatives for that kind of work, but the prints show up better than vignettes. If you do have to resort to vignette printing, make your board fit the subject and make it right. I find empty plate boxes or covers make excellent vignetting boards. I cut the opening at least an inch larger than I want to show, and cut the sides of the box so the bottom will come very close to the negative, and the top the full height of the box. Cover the opening with tissue, and then use opaque to blend it with. "Strauss marl" should be in every printing room, not only for vignetting, but it is a great help to build up weak spots or hide defects in the negatives. When you have a negative with a weak and defective background, with the "marl" and a sponge you can do wonders. Try it.

As I said before, keep the printing clean. Use the broom and scrub brush frequently, make even prints, use care and good judgment, and, when you turn your work over to the toner, have it right.

For matt-surface paper a stronger negative is needed than for gloss papers. You can build up your negatives when they are weak, or strengthen the high lights when needed, by placing tissue paper on the outside of the frame, and rub on some soft red or yellow pastel where you wish to hold the printing back. For instance, take a negative with a dark face, or part of the face in shadow, and the draperies strong. You can by this means hold the shadows back until the high lights are printed to a sufficient depth.

The toning room is another source of all kinds of effects and defects. No matter how perfect the printing is, or how good the prints, this department is where most care should be taken. Have plenty of room, and sinks large enough to hold your trays, and trays large enough to hold your prints, and plenty of them. It may seem a little on the "fairy-story" order to tell you that I have been in a so-called gallery and been given a common wash dish and a water pail with the bail off to tone a batch of prints with. Just think of it! and that man complained of lack of trade and hard times. Trays he knew not of. He developed his plates in meat platters, and said they were good enough and cheaper.

I prefer *papier-mâché* trays to any other. Of course, the large trays are more expensive, but with proper care they will last a long time. If you think you cannot afford them, get some boxes made of half-inch stuff, 22 × 28 inches in size, with cleats on the bottom, and get the common oilcloth table covering at any dry-goods store at twenty-five cents a yard and fifty inches wide, and cover the same. They make good trays, and by recovering when they begin to show wear you will have good trays at a slight cost.

Don't allow truck to accumulate in the toning room. If you can have it, oilcloth on the floor will keep the water from soaking into the floor, and can be wiped up and kept clean. As most sinks are so small, it is an impossibility to empty trays without spilling some water on the floor; it were better to have a zinc floor put in, with a drain at one end connecting with the waste pipe, but have a washing tank. Of course, prints washed by hand are more sure to stand. A good wash tank, with a false bottom—a cane weave I prefer—with a syphon, is the proper thing. It's a good policy to have an overflow pipe also; but don't depend upon an overflow, for it costs too much to settle with the man downstairs next morning if Oscar should go away and leave the water running all night and the overflow should get clogged up.

Have shelves for your toning solutions, and keep them clean. Have

racks to hold your toning trays, so they won't come in contact with one another, or where foreign chemicals will drip on them. Always wash your trays after using, if soiled. Take a handful of table salt and dampen it a little, and go over them, it will clean them.

FILING AWAY NEGATIVES.

When an order is filled, print an extra of the head, and tone and paste on the envelope or negative sack. Always sack and number your negatives, as well as put the address on. It is handier to replace the negative, and also, in case of two or three of the same party, you can show the customer a print of their duplicate order, when you get one. The sacks prevent your negatives from being scratched or harmed. Always varnish your negatives after the retouching with a thin varnish It prevents the retouching from being rubbed off; or, in winter, if you should be careless, and let a flake of snow or a sprinkle strike them, your paper don't stick to the gelatine and ruin the negative. C. L. WEED.

BURNISHED OR MATT-SURFACE PICTURES.

[Photographic Times.]

HAND in hand with the depression of photography, from a commercial point of view, has happily gone a very noteworthy improvement in the artistic side of the same. To-day, people are not satisfied with making pictures just so good or so bad as to pass muster, but are obliged as far as possible to take into account the artistic effect. For this reason, much attention is paid at the present time to posing, and the arrangement of the surroundings, and in lighting the aim is to avoid all contrasts. The reform in photography is most noticeable in the choice and application of the printing materials. While a few years ago photographs in so-called albumen tones only were known, at the present time pains are being taken to introduce prints in black, either in the shape of platinotypes or imitations of such, prints on mignon paper, matt celloidin or kalitypes.

It has often been argued, which are better, burnished or matt pictures? It is very easy for one who understands art principles to judge of this question. The glossy surface of a picture cannot be artistic so long as, above all things, it does not correspond to nature.

The human face never gives one the impression of having been varnished or polished, and so is it the case of all other things which are photographed. What in nature really shines should be reproduced in the photograph as light coloured in the various gradations of tone. Shadows in nature never shine, and when we give the same a high polish in our pictures we are guilty of a grievous fault.

It may be said that the shadows should appear transparent, and not heavy; I have nothing to say against that, but this transparency should not be produced by means of a polish. In a good copper or steel-plate engraving, a good woodcut or lithograph, the shadows should likewise appear transparent, and such is the case; it would never enter any one's mind to varnish such pictures. Even a person with no artistic sentiment feels that this would be absurd, and on this account we can boldly assert that the photographers themselves have accustomed the public to the unnatural high polish. This view finds more and more support from professionals, and the question now is, How shall we educate the taste of the public in another direction?

In the first place we must not overdo the matter, that is, we must not jump at once from the high burnish to an absolute matt finish; the contrast, in the first place, would be too great, and, secondly, not appropriate for all cases. For small pictures, *cartes-de-visite*, &c., a paper should be used made from an emulsion which as much as possible reproduces the delicacies of the negatives, which latter should not be too intense. For this purpose, matt-surface collodion paper, as found in good quality in the market, is very suitable. The prints should be toned in a gold bath to a blue-black colour. So-called albumen tones are utterly unsuitable. For larger-sized pictures, about cabinet size, a paper is recommended which requires somewhat stronger negatives, by which means unusually good, vigorous, and plastic prints are obtained. For large groups the cold-bath platinotype process paper and kalitype are highly recommended. Very large groups often require much retouching, and, on this ground, the use of a paper with a rough, not easily injured, surface is not only desirable, but absolutely necessary.

Our Editorial Table.

THE NATIONAL PHOTOGRAPHIC COMPANY'S DRY PLATES AND PRINTING-OUT PAPER.

THE National Photographic Company, of Cromwell-road, Southampton, have recently embarked in the preparation of gelatine dry plates and gelatino-chloride paper, and we have received samples of their ordinary plates and the paper. The plates are of about medium rapidity, and yield clean, bright negatives of excellent quality, with which it would be impossible to find fault. The paper, for which the sulphocyanide toning bath and the usual treatment of gelatino-chloride are recommended, has evidently been well and carefully prepared, for the prints were in every respect equal in tone and richness to the best we have seen produced by this process. The Company, which is directed by experienced photographers, deserves every success in its enterprise.

PHOTOGRAVURE.

By HENRY R. BLANEY. New York: Scovill & Adams Co.

FORMING one of the Scovill Photographic Series, this little work gives, according to its Editor, Mr. W. E. Woodbury, a working description of the [photogravure] process, as practised to-day by many of the leading firms in America and other countries. The process is substantially that which has been recently described and demonstrated by our friends Mr. Wilmer and Mr. Denison. The book, both in respect of its accuracy and fulness of details, is an excellent one, and might safely be taken as a practical guide. We note that, in addition to the carbon process usually employed for the transparency, a recommendation in favour of Carbutt's gelatino-albumen plates is given.

PHOTOGRAMS OF 1895.

London: Dawbarn & Ward.

THIS handsome volume appeals to all lovers of pictorial photography. Excellent and discriminating critical studies by Mr. Gleeson White and the staff of the *Photogram*, and half-tone reproductions of many of the now-familiar photographs hung at the Dudley Gallery and at Pall Mall form the staple material of the book, which also includes illustrated articles by Mr. Stieglitz, Mr. Bhedwar, Mr. W. K. Burton, and others. It is a beautifully got-up book, and it conveys a fair impression of the present position, among the arts, of pictorial photography at home and abroad.

HINTOKINONE.

MESSRS. HINTON & Co., of Bedford-street, Covent Garden, recently sent us a bottle of that favourite developer, Hintokinone, which reached us at a moment when, for lack of time, we were glad to escape even the small labour of mixing up a fresh quantity of developer. Hintokinone is a capital one solution developer, suitable alike for negatives and transparencies, which, by simple dilution, or the addition of bromide, gives one great power of coping with under or over-exposure. It yields deposits of good colour, and is unquestionably a handy developer for all round use.

THE "BARNET" EXTRA RAPID PLATES AND CELLULOID FILMS.

Elliott & Son, Barnet.

SINCE the accession of Mr. Hubert J. Elliott to the chief command of Messrs. Elliott's works, the well-known Barnet house is manifestly keeping well abreast of its competitors. Of their more recent introductions, the "Barnet" extra rapid plates (selling at one shilling per dozen for quarter-plates) and the "Barnet" films, we have received samples for trial. The former possess a very high degree of rapidity approximately 24° Warnerke we should say, and being easy to develop should prove popular with those who require a very rapid, cheap plate. The films, coated with a slower emulsion, are very flat, pleasant to manipulate, and yielded us sparkling, vigorous images. They will undoubtedly be much appreciated by users of cut films.

ARUNDEL & MARSHALL'S NEGATIVE BOXES, &C.

MESSRS. ARUNDEL & MARSHALL, of Penn-street Works, Hoxton, are justly held in high esteem for the good quality, neatness, and handiness of their cloth-covered, grooved plate or negative boxes, one or two of which they have recently submitted to us. Nothing could be more convenient in which to store negatives, lantern slides, or unexposed plates. Microscopists, also, are catered for in the way of holders for microscopic slides of compact form, suitable for pocket transport or ordinary storage.

News and Notes.

ON Wednesday evening, November 13, Mr. Paul Lange will show a series of slides at the Royal Photographic Society's Exhibition, 5A, Pall Mall East, illustrating *Norway Revisited*. The Exhibition closes on the 14th inst.

ROYAL PHOTOGRAPHIC SOCIETY.—Ordinary Meeting, Tuesday, November 12 at the Gallery, 5A, Pall Mall East.—*Colour-correct Photography and a New Plate*, by Mr. James Cadett. *Notes on the Sensitiveness of Picrated Gelatine to Light*, by Mr. W. K. Burton, C.E.

WE are sorry to learn of the death, in his sixty-seventh year, of Mr. Arthur J. Melhuish, F.R.A.S. Deceased, who had been connected with photography for a great many years, had, for a considerable period, acted as Secretary of the Amateur Photographic Association. He died on November 2.

WE have received the prospectus of the Craft Instruction in Photography and Process for the winter session of the Polytechnic Institution, 309, Regent-street. Classes are to be held in almost every branch of photography, art, and technique, under the direction of well-known workers and authorities. The prospectus may be obtained of the Secretary at the address given.

THE National Society of Litho-Artists, Designers, and Engravers, in conjunction with the L. C. C. Technical Education Board, are holding, at the Central Art Department, Bolt-court, E.C., during the winter session, classes in half-tone etching, photo-lithography, photogravure, and other branches of reproduction work. Lectures on allied subjects are also to be given. Full particulars may be obtained of the Secretary.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, November 13. Mr. E. J. Wall will give a practical demonstration of the spectroscopic examination of glasses for dark room purposes. Mr. Davenport will exhibit and describe his new lantern-carrier, and the Club lantern will be available for the trial of members' slides. Visitors are always welcomed by the members.

PHOTOGRAPHERS' COPYRIGHT UNION.—The Annual General Meeting will be held in the Upper Regent Saloon, St. James's Hall (Piccadilly entrance), on Friday, November 22, at eight p.m. In addition to the members, all professional and amateur photographers, artists, and others interested in the question of copyright are cordially invited to be present to receive the Report of the Committee for the last two years, together with suggestions for the future working of the Union, and matters of interest to the profession generally.

MR. JOHN ANDERTON writes: "One of your notes in THE BRITISH OURNAL OF PHOTOGRAPHY of November 1 is to the effect that an Exhibition of Coloured Stereographs will, at an early date, be given at the London and Provincial Association. You add that this 'goes one better than Mr. Anderton's system.' Will you permit me to remind you that with my lantern stereoscope coloured stereographs can be as readily shown as plain ones. On the red-and-green glass system, coloured slides are, of course, impossible; but in mine, as only white light is used, of course all colours are reproduced upon the screen. The only trouble is in obtaining good coloured slides nowadays, the usual daubs so designated are, in most cases, inferior to the plain photographs."

PRESERVING THE DEVELOPER.—We would refer to Ilford developing formulæ given on each box of plates, and draw special attention to the method therein recommended of preserving the pyro solution, which method has remained unaltered for the last sixteen years. We say unhesitatingly that the addition of the nitric acid is by far the most effective and least harmful plan of preserving the solution that science or experience has produced. We are surprised to find that the use of sulphite of soda as a preservative is still recommended *in the pyro solution* by those whose knowledge of the subject ought to teach them how great a fallacy is contained in the practice. Sulphite in this solution is not a preservative of developing power of the pyro, but is actually a means of hastening the decomposition of the developing reagent. It is true that the solution will remain longer colourless when sulphite is present, but the advantage ends with the appearance. In reality the pyro is gradually being destroyed. One or two experimental tests of the two methods side by side at once demonstrate the truth of what we say. Naturally, pyro solution that is preserved with acid and kept long will discolour, but, tested with a solution preserved with sulphite, will show that the latter, though colourless and apparently good, has lost much more of its developing power than has the discoloured solution made up with nitric acid if the two solutions have been made up at the same time.—*Photographic Scraps.*

THE SALE OF POISONS IN INDIA.—The Government of India appears, from a leaderette in the *Times of India* of October 8, to be at last taking up the question of the sale of poisons in the peninsula. There is practically in India, says our contemporary, at the present time, free trade in poisons, and the consequence is that the annual number of deaths from poisoning, as shown by the reports of the various official analysts, is very large. It is quite time that some measures were taken to exercise control over the vendors of toxic agents. At the same time we are bound to confess that the subject is beset with difficulties. The central authorities are seeking the views of the various local governments, and it appears that the first item to be taken in hand will be the sale of arsenic, with possibly some regulations regarding the sale of European medicines and native remedies, in the shape of a compulsory licence to all vendors, who would be required to sell poisons only on medical prescriptions, or where the name and address of the purchaser were registered. In purely rural districts the question is far more difficult than in the towns, for arsenic is in much request for curing hides and similar purposes, and such poisons as datura are extremely common by the wayside. The Government are aiming at a measure which will provide protection against the improper use of poisons, without restricting legitimate trade, and this in a country like India is a somewhat large order. In Bombay there has been a Poisons Act for over twenty years; but, according to our contemporary, it is practically a dead letter, and the regulations regarding the registration of the names and addresses of persons to whom poisons are sold little better than a farce.

POINTS FOR PROFESSIONALS.—None of us refuse to profit by a hint if we can see that it is in our interest to do so, provided that hint is not put in the form of a command; and, as the following few points are offered in the reader's interest, perhaps he will accept and profit by them. These cautions, for that is what they amount to, should be found useful and valuable, particularly to professional workers, to whom a failure when it happens means loss—a considerable money loss—of possibly a whole batch of prints. Some of the suggestions are probably known to many, but we shall feel that good work has been done by bringing them to the attention of even a few workers. *White spots with diffused edge* (not a sharply defined edge) are sometimes met with in the finished Solio print. They are caused by (1) undissolved particles of alum in the combined bath resting on the surface of the print during the toning and fixing process; (2) undissolved particles of alum on the surface of the print when an alum bath is used in conjunction with a separate bath, such, for instance, as the sulphocyanide bath. *Greenish-white spots* occasionally appear on Solio prints. They are due to a splashing of the fixing bath on to the prints at some time before they are immersed in the hypo bath. *Yellow stains on Solio prints* are brought about by allowing the prints to remain in the washing water too long without moving. During hot weather, when the temperature of the water is somewhat high, it is particularly necessary to guard against this trouble. *Blisters on bromide prints* are a trouble usually associated with hot weather, and can be prevented by using an alum bath after fixing. It is better, however, to make an addition of alum to the hypo bath. If there is a tendency on the part of the bromide paper to blister, use a weak hypo bath first, and finish the fixing in a stronger bath.—*Kodak News.*

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 20,539.—"Improvements in Apparatus for Use in Binding Lantern and like Slides." R. SMITH.—*Dated November*, 1895.

No. 20,604.—"A New or Improved Photographic Dark Slide Spring Catch and Exposure Recorder for Cameras." F. P. NEWLEY.—*Dated November*, 1895.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
11	Camera Club	*Optics and Lenses.* Lyonel Clark.
11	Lantern Society	
11	Norfolk and Norwich	
11	North Middlesex	
11	Oxford Camera Club	Members' Exhibition.
11	Richmond	*Lantern-slide Making (Gelatine).* J. D. Gibson.
12	Birmingham Photo. Society	Hints on General Working by William Jones.
12	Brixton and Clapham	
12	Hackney	
12	Manchester Amateur	
12	Newcastle-on-Tyne & N. Counties	
12	Paisley	
12	Royal Photographic Society	*Colour-correct Photography and a New Plate.* James Cadett.—*Note on the Sensitiveness of Picrated Gelatine to Light.* W. K. Burton, C.E.
12	Stockton	
13	Croydon Camera Club	*Shakespeare's Country.* Mrs. Catharine Weed Ward.
13	Ipswich	
13	Leytonstone	
13	Munster	
13	Photographic Club	Demonstration of the Spectroscopic Examination of Glasses for Developing Purposes. E. J. Wall.—Mr. Davenport will Exhibit and Describe his New Lantern-carrier.
13	Southport	
13	Stockport	
14	Bradford	
14	Camera Club	
14	Cheltenham	
14	Darwen	*Tour in Yorkshire.* J. T. Lees.
14	Glossop Dale	
14	Hull	
14	Leicester and Leicestershire	
14	Liverpool Amateur	Demonstration on Combination Printing. J. W. Wade.
14	London and Provincial	
14	Manchester Photo. Society	Demonstration of the Working of the Carbon Process. H. Wade.
14	Oldham	
14	West London	
15	Birkenhead Photo. Asso.	Photographic Notes by many Members.
15	Cardiff	
15	Croydon Microscopical	Trial Night of Members' Slides, and Selection for *Soirée.*
15	Holborn	
15	Leamington	
15	Lewisham	*Some Notes on Micro-photography.* W. J. Dibdin, F.I.C., F.C.S.
15	Maidstone	
15	North Kent	
15	Plymouth	Members' Lantern Evening.
16	Hull	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

OCTOBER 31,—Mr. E. H. Bayston in the chair.

Mr. J. E. HODD showed some badly discoloured bromide prints, for which he could not account. He said that packets of the same paper, developed by other people, exhibited the same defects.

Mr. W. E. DEBENHAM thought the marks might be caused by pressure during the packing of the paper, and suggested that a piece of thread or similar substance should be inserted between two pieces of the defective paper, passed through a press, and developed.

Mr. A. HADDON believed it to be caused by the pressure exerted during the cutting of the paper.

It being a Lantern Night, slides by Mr. W. D. Welford, consisting of hand-camera shots of various places in Belgium, Holland, and Germany, and at the Shrewsbury Convention, were shown and described. Mr. T. E. Freshwater showed a very interesting series, reduced from $7\frac{1}{2} \times 5$, descriptive of the cultivation of the hop, its picking, drying, and preparation for the market, which were much admired. Slides were also exhibited by Messrs. W. Steinmetz, Hill, and F. C. Kellow, together with some by Mr. Loman, of Amsterdam, on a new Dutch lantern plate.

PHOTOGRAPHIC CLUB.

OCTOBER 30,—Mr. S. H. Fry in the chair.

Mr. L. M. Tindall was unanimously elected a member of the Club.

Mr. Tottem showed some pictures taken by a young photographer, *i.e.*, he had been practising the art but eighteen months, including a series of 4×5 pictures, forming a panoram. They were all pronounced very good.

Mr. Welford presented from Mr. Loman, of Amsterdam, some lantern plates.

Mr. Fry and Mr. Bridge took a box each, and promised to bring up results.

Mr. BRIDGE then proceeded with his lecture upon *Holland and the Hollanders*, illustrated by pictures from negatives by himself and Mr. Bridgeman. As usual, Mr. Bridge interlarded his talk with facts and figures which added interest to the lecture. There were some 150 slides shown.

Mr. Tottem introduced Mr. Lane, of New York, who was welcomed on behalf of the Club by Mr. Haes.

Brixton and Clapham Camera Club.—October 29, Mr. J. W. Coade (President) in the chair.—At the above meeting Mr. F. W. Edwards (President of the South London Photographic Society) gave an interesting demonstration of the cold-bath platinotype process. After passing round a number of prints to show the depth of printing advisable, Mr. Edwards proceeded to develop them in the presence of a large attendance of members. "It is most important," he said, "that the paper should be kept perfectly dry, and this is best done by keeping in a calcium tube. Undeveloped prints should not be placed between the leaves of a book, or they are sure to deteriorate. The developer is made by dissolving half a pound of oxalate of potash in about thirty ounces of warm water, and can be used at once. Correct printing is best, but under-exposed prints may often be saved by using a strong warm developer, while over-exposed ones should be developed by a cold and dilute one. A warm developer is very rapid in its action. There was no advantage in developing the prints face downward, as recommended by the Platinotype Company, as it is impossible to watch the progress of development by so doing. No harm is done by leaving properly exposed prints in the developer a longer time than necessary, as, when the image is fully out, no further action takes place. Prints may be developed by drawing through a dish containing a small quantity of developer, or by rubbing over the surface a pad of wadding wet with the developer. These methods are useful for large prints where the dishes are not large enough to take the prints in the usual manner, and parts of the image may be kept back, if desired, by adopting this method of working. The addition of glycerine to the developer when local development is resorted to is unnecessary. When sufficiently developed, the prints should be transferred to a fixing bath of one part hydrochloric acid in sixty parts of water, and, after about ten minutes, placed in a second bath for a similar time. On no account must a print be touched before or during development by fingers not entirely free from the fixing acid, or it will be spoilt. The hydrochloric acid dissolves out the salts unaffected by light, leaving an image of metallic platinum. After removal from the fixing bath, the prints are washed in water for a few minutes to free the paper from acid, and afterwards dried. The drying may be hastened by placing the prints for a short time between blotting-paper. The platinotype process is unequalled for black-and-white work, and by its aid prints may be made which are almost undistinguishable from engravings. It is simple to work, and, above all, the results are absolutely permanent." Several questions were asked by members and replied to, and the meeting closed after passing a unanimous vote of thanks to Mr. Edwards for his demonstration.

Croydon Camera Club.—The meeting on Wednesday, the 30th ult., was a Lantern Night, when slides were shown by the following members:—Messrs. George Paice, *Hounds and Horses;* W. Wreford, *Irish Scenery;* G. W. Jenkins, *The Thames;* J. Smith, A. Noaks, *Lady Footballers;* A. E. Isaac, J. Rogers, W. Burn, C. Bray, and G. R. White (the Hon. Lanternist). The following were elected members:—Messrs. P. D. Penn and J. Platt.

Hackney Photographic Society.—On the 29th inst., Mr. W. L. Barker presiding.—In the course of the evening two very interesting papers on *The Collodio-chloride Process* and *The Preparation of Rough and Plain-surface Papers* respectively were given by Mr. G. H. Moss, who demonstrated each in turn, and exhibited many excellent examples of work done by each method. For the first-mentioned process the formula was as follows:—*A.* Zinc chloride, 12 grains; tartaric acid, 5 grains; citric acid, 5 grains; dissolve in $1\frac{1}{2}$ ounces methylated ether. *B.* Silver nitrate, 60 grains; dissolve in 30 minims distilled water by heat, add 100 minims glycerine (pure), and 4 ounces of methylated alcohol. Add to this 60 grains gun-cotton (high temperature), well shake, and then add $1\frac{1}{2}$ ounces of ether. When all is dissolved, this should form a greyish white emulsion of silver in collodion. The process to this stage may be in daylight, but the after-operation should be conducted in the dark room or by gaslight, taking care, in the latter case, not to have an explosion with the collodion solvents. When all is ready, the *A* solution should be added to *B* a few drops at a time, well shaking the bottle after each addition. All being added, the mixture must be well shaken for five or ten minutes, so that the ingredients may be thoroughly mixed, as on this, to a great extent, success depends. Stand bottle aside for about twelve hours to allow impurities to settle, and then either decant or filter through cotton-wool into another bottle. The paper used for coating should be what is known as baryta paper. After arriving at this point of his paper, of which the above is a summary, Mr. Moss showed how to coat the paper by holding the latter in a kind of hinged frame, and pouring the emulsion evenly over it. He said that the paper should be gently rocked from side to side after pouring off the superfluous emulsion, to prevent crapy marks. When set, which was the work of a few seconds, the paper was to be hung up to dry, an operation taking one or two hours. Printing should be continued until the heavy shadows were slightly bronzed. Any toning bath might be used, but Mr. Moss's favourite formula was, soda acetate, 40 grains; water, 8 ounces; gold chloride, 2 grains; and then add three or four drops of saturated solution of chloride of lime. The emulsion would keep well if kept in a dark room. On the subject of the preparation of plain and rough papers, Mr. Moss said that it had been his object to obtain a method of preparing plain sensitive paper without the aid of gelatine. As the latter was used in the salting of paper to get vigour, it was necessary to find an efficient substitute which would be without the disadvantages of gelatine. After a series of experiments, the following formula was obtained:—Sodium chloride recrystallised, 150 grains; ammonium chloride, 100 grains; potassium bichromate, 4 grains; water, 20 ounces. Get some Whatman's drawing paper, either the rough or smooth surface, or, if a fine surface is desired, some Rives paper. Soak in above bath for from three to five minutes, and hang up to dry. When dry, sensitise by floating on following bath for about two minutes:—Silver nitrate, 1 ounce; citric acid, 150 grains; water, to $8\frac{1}{2}$ ounces. The surface of the sensitised paper should be of a light primrose colour, due to the formation of chromate of silver with the chloride. This chromate gives vigour to the prints, and, in fact, the paper may be modified to suit different kinds of negatives by altering the proportion of the bichromate in the salting bath. With the normal quantity as given above, negatives suitable for P.O.P. will do. For denser negatives, use a smaller quantity of bichromate; for weak negatives use more than normal. Any toning bath may be used, and the fixing bath should be a ten per cent. solution of hypo, used fresh. An interesting discussion followed.

Putney Photographic Society.—October 30, Dr. W. J. Sheppard in the chair.—Mr. FRANCIS T. BEESON gave a very instructive demonstration on the preparation of negatives for printing. After advising that every effort should be made to secure perfect negatives by careful exposure and development, the lecturer said the chief difficulty was found in keeping the balance of gradation in the negative, such as could be reproduced by the printing process used. First taking chemical methods of treatment, he showed by means of the lantern negatives requiring different treatment, strongly advising that, when negatives were veiled, they should be slightly reduced before intensification. Monckhoven's method of intensification was recommended. Local reduction was next referred to and demonstrated, as was also a method for dealing with harsh negatives by first converting the image into bromide of silver and developing in strong light, stopping development before the heavy deposit in the lights was reduced, and fixing out the remaining unaltered bromide of silver. Prints were handed round showing the effect of this treatment, also others showing the effect of masking the shadows by means of oil colours dabbed on with a pad of cotton-wool and wash-leather. Time preventing the lecturer dealing with several other methods of treating defective negatives, Mr. Beeson kindly promised another lecture and demonstration on this most useful subject.

Streatham Photographic Society.—The Half-yearly Meeting of this Society was held at the headquarters on Wednesday, October 30, the President, Dr. Hull, in the chair, supported by the Vice-President, Mr. J. D. Lewis. The minutes of the last meeting having been read, the HON. SECRETARY, Mr. J. J. Lewis, drew the attention of the members to the fact that this Society had been established just six months, and that on this occasion he had the pleasure of nominating the twenty-fifth member (exclusive of honorary members) in the person of Mr. Thomas Watson, of Holborn and Streatham Common, a gentleman known throughout the photographic world and looked up to as a leader in photographic apparatus, especially of first-quality lens. Dr. Hull seconded, and Mr. Watson was unanimously elected. The next meeting night will be November 16, at nine o'clock. After the close of the formal business a Lantern Competition was entered upon in Part I. Eight members sent six lantern slides each, of their own making, which were voted of very high order. The following gentlemen took the first three places:—Mr. Taylor, 116 marks; Mr. Coombs, 113; Mr. Negus, 107. A most enjoyable evening was passed, the meeting not breaking up until nearly eleven o'clock.

Bath Photographic Society.—An ordinary meeting was held at the Royal Literary and Scientific Institution on Wednesday, the 30th ult. Mr. Aug. F. Perren presided.—The CHAIRMAN having announced several future meetings and other business, Mr. E. LAMBERT gave a practical demonstration of local intensification, in which he showed how a dry negative could be strengthened where necessary without affecting other portions. Mr. A. F. Perren gave a demonstration of developing and fixing platinotypes by the present popular method of cold solutions, and described local strengthening by the brush method. He also exhibited Beck's Skate-blade print trimmer, and showed its utility for wet or dry prints. Colonel SEALY read a short paper, pleading for less formality at ordinary meetings, and inviting expression of opinion generally on work brought forward by members who were anxious to learn the faults such work contained. If a slide possessed no special feature of excellence, it would be passed by in dead silence. The author might wonder, but he would be no wiser, and probably do the same work over again and with a like result. He contended there should be greater freedom of opinion and useful criticism would prove most helpful.

Cardiff Photographic Society.—At the weekly meeting on Friday, Mr. G. H. Wills, jun., gave an interesting lecture, illustrated by lantern slides, entitled *The Rhine Tour*. The President, Mr. S. W. Allen, exhibited his new Patent Automatic Science Lantern in its improved form, which caused a considerable amount of interest. The main feature of the lantern consists of a sliding box or magazine, divided into compartments, sliding beneath the optical portion of the lantern. The set of slides for a lecture to any number are placed in this magazine, through which a vertical plunger passes, and takes each slide into position, the same movement working a dissolver of celluloid, which rises and dissolves the picture on the screen. A handle with cranks on each side of the slide chamber is revolved, and upon the centre spindle of the crank a can is fixed. This sets in motion a rachet which comes into contact with a division in the box below, pushing it forward to the extent of one slide at each revolution of the crank. A projection upon one of the connecting rods presses against a side lever at the proper moment for operating a translucent dissolver, and two vertical rods on either side of the slides, with projecting arms, push each slide downwards into its place in the receptacle below. An indicator at the side of the magazine chamber shows which slide is in position, and any given slide can be put into view instantly, and be returned into its proper place. The objective is carried on a front fixed upon horizontal tubes, which are attached to the top of the lantern instead of underneath, which enables the lantern to be folded back into a vertical position, so that it may be used for projection by reflectors or prisms. The body is made of highly polished aluminium, which, being unaffected by heat, always retains its handsome appearance. Special arrangements are also made to keep the lantern cool in working. To show that there is no likelihood of a hitch in the mechanical arrangements, Mr. Allen passed fifty slides through in the short space of twenty-five seconds. A vote of thanks to the demonstrators brought a successful evening to a close.

Halifax Camera Club.—A lecture was given on Friday evening at the Club-rooms, Crossley-street, by Mr. ARTHUR PRIESTLEY, the Secretary. The subject was *Hints on Portraiture*, and very interesting and instructive the lecture proved to be. Mr. Priestley, who is a practical photographer, threw out a number of valuable suggestions and hints, which are bound to be of service to those who will notice them and put them into practice. The numerous pitfalls into which novices are apt to stray were also pointed out and the necessary warnings given. The after discussion was taken part in by Messrs. J. I. Learoyd (President), Edgar Booth, C. Foster, T. Wardle, A. Hind, and other gentlemen. Tue Club-rooms have recently been renovated, and a very successful session is anticipated. This (Monday) evening an exhibition of prize lantern slides is announced, to which amateurs and interested friends are cordially invited.

Liverpool Amateur Photographic Association.—The Tenth Ordinary Meeting of the thirty-second session was held in the Club-rooms, Eberle-street, on Thursday evening, October 31, the President, Mr. George B. Newton, in the chair. Mr. H. Schneider was elected a member of the Association. Messrs. David L. Chalmers and Benjamin Cookson were voted as Hon. Auditors of the annual accounts. The feature of the evening was a lantern lecture by Mr. E. R. DIBDIN, entitled, *Sunny Seas and Sunlit Cities*, in the course of which he narrated, with numerous humorous touches and abundance of anecdote, his experiences during part of an Italian tour, the places visited including Genoa, Pisa, Leghorn, Florence, and Fiesole. Each locality was fully illustrated with lantern slides made by the lecturer, chiefly from photographs taken by himself.

Nottingham Camera Club.—The Annual Meeting of the Nottingham Camera Club was held on October 31 in the Club-room of the Mechanics' Institution, Nottingham, Mr. T. K. Gordon presiding. The Annual Report, read by the Hon. Secretary (Mr. W. Edgar), said that the Committee had to congratulate the members on the prosperous condition of the Club. The membership now stood at 81, as against 68 at the corresponding period of last year. The receipts for the year amounted to 22*l*. 10*s*., and the expenditure to 20*l*. 7*s*. 5*d*., thus leaving a balance in hand of 1*l*. 12*s*. 7*d*. The Club also possesses books, apparatus, fittings, &c., bought out of capital, but which are not taken into consideration in the balance-sheet. During the past year outdoor meetings have been held at Barton, Melbourne, Hemmington and Lockington, Belvoir Castle, and Southwell, but, on the whole, these have not been a success. The report was adopted on the motion of the Chairman. The following officers were elected for the forthcoming year:—*President:* His Grace the Duke of Newcastle.—*Vice Presidents:* Lord Henry Bentinck, M.P., Colonel Seely, Messrs. W. I. Abel, B.A., S. Bourne, J.P., A. Brown, M.I.C.E., J. A. H. Green, J. Harrison, A. Pyatt, G. H. Wallis, F.S.A., R. L. Warham, and C. B. Wright.—*Committee:* Mrs. Fraser, Messrs. F. W. Fewkes, A. W. Howerden, A. R. Hartley, R. G. Holbrook, J. T. Radford, and W. H. Warsop.—*Hon. Treasurer:* Mr. E. H. Wilson.—*Hon. Secretary:* Mr. W. Edgar. The Chairman concluded the meeting by moving a vote of thanks to the Secretary and Treasurer, which was carried by acclamation.

Oxford Camera Club.—The last meeting of the Club was held on October 28, in the large lecture theatre of the University Museum. Arrangements were made for the forthcoming Members' Exhibition, details being left to the Committee. COLONEL IMPEY then gave a most interesting lecture on different parts of India, specially the North-west Provinces and the Punjab. The lecture was illustrated by slides from a fine series of large wet-plate negatives, taken thirty years ago by the lecturer, who spoke feelingly of the difficulties encountered in working the collodion process in such a climate as that of India. Descriptions were given of views shown of various Abu temples in Rajpootana, the Taj at Agra, the Cashmere gate at Delhi, Simla and the Himalayas. A hearty vote of thanks to the lecturer closed the proceedings. The Exhibition has been fixed for November 12 at the Holywell Music Room.

Photographic Society of Ireland.—This Society held its meeting on Thursday evening, the 24th ult., at the room, 35, Dawson-street, Dublin, Professor J. A. Scott (President) in the chair. Mr. R. M. INGLIS delivered a very interesting lecture, entitled, *A Trip Through Switzerland*, and described in a lucid manner the places of interest which he visited, showing, at the same time, no the screen photographs of the various localities. The lantern was worked by Messrs. Hargrave and Cooper. The attendance was very large, and must have included from 150 to 200 persons, comprising members and their friends.

FORTHCOMING EXHIBITIONS.

1895.		
November 8–14	*Royal Photographic Society.	R. Child Bayley, 12, Hanover-square, W.
,, 19–21.....	*Hackney.	W. Fenton-Jones, 12, King Edward's-road Hackney.
,, 22–30.....	*Stanley.	Walter D. Welford, 59 and 60, Chancery-lane, W.C.
,, 28–30.....	*Leytonstone.	B. Harwood, 110, Windsor-road, Forest Gate.
December 20, 21.....	*Nottingham Camera Club.	W. Edgar, 123, Clinton-terrace, The Park, Nottingham.
1896.		
March	*Cheltenham Amateur Photographic Society.	Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

SCIENTIFIC (*Sic*) ADVERTISEMENT.

To the EDITOR.

SIR,—In entering the lists of controversy respecting Messrs. Taylor, Taylor, & Hobson's scientific method of advertising their newest form of lens, I should question the advisability of such forms of advertisement, for it would obviously form the basis of many such others, the ultimatum being a pitched battle as to which lens, paper, and other photographic medium was better than the other. The Goerz and Zeiss principles of lens combinations were reported as being nearer the acme of perfection than any other, but *never* by such a form of advertisement as that lately resorted to.—I am, yours, &c.,

"A USER OF SEVERAL DALLMEYER INSTRUMENTS."

To the EDITOR.

SIR,—I regret that accuracy, as well as etiquette, seems foreign to Messrs. Taylor, Taylor, & Hobson.

The title of their letter and the first paragraph are distinctly at variance with fact. In my previous letter I made *no* attack on Messrs. Taylor, Taylor, & Hobson, their lenses, or the Cooke lens. The question at issue was the insidious method of pictorial advertisement adopted by them, and to this I have a right to confine myself.

They quote my first objection fully, that "the comparative illustrations in no complete or honest sense convey the comparative merits of the two instruments," but do not reply to it, merely reiterating the conditions of their particular test as set forth in the home-made "affidavit" already referred to. In a characteristically accidental manner, they only partially quote my second objection, that "for the purposes of such advertisement a true diagram could readily be constructed making an inferior instrument appear vastly better than a much more perfect one, and *vice versâ*," leaving out the very important words, "and *vice versâ*," and forthwith accuse me of an insinuation that is neither intended nor implied in my letter.

I have consistently refrained from commenting upon the work of a contemporary, but I think I may be allowed to suggest the possibility that the Cooke lenses have advantages as well as disadvantages in comparison with the rapid rectilinear type when seriously examined from an optical expert's point of view. The true meaning of Messrs. Taylor, Taylor, & Hobson's advertisement is only intelligible to an expert, and can be duly weighed, but it is grossly misleading to the uninitiated. Hence the protest on broad lines, and not one of petty or personal interest.

Messrs. Taylor, Taylor, and Hobson's feeble reference of the "*tu quoque*" order to an advertisement that probably emanates from my firm is amusing. They say, "Our advertisement will compare favourably," &c. I do not pretend to cope with them in their capacity as "modest" advertisers on the cheap, and at once yield pride of place to them in this respect. They might, however, abstain from destroying the sense of other people's announcements by *one masterly stroke* of their advertising pen. The italics are mine.—I am, yours, &c., THOMAS R. DALLMEYER.

25, *Newman-street, London, W., November* 1, 1895.

[This correspondence, which is solely concerned with the ethics of advertising, and, if continued, could not possibly be of the smallest scientific interest to our readers, must here terminate. Several other correspondents will therefore understand the reason of the non-appearance of their letters.—ED.]

THE PHARMACY ACTS.

To the EDITOR.

SIR,—By to-day's decision in the High Court of Justiciary, I am deprived of the title chemist, though I am a certified proficient in chemistry, and have handled and sold chemicals, including the scheduled poisons, daily for thirty years now, without any one being a penny the worse for this terrible curse.

In law, then, the word "chemist" means druggist, or pharmacist, and we are asked by the Pharmaceutical Society to regard Faraday, Pasteur, and Roscoe as eminent druggists.

I am not counted qualified to prepare an intensifying solution, a volumetric solution, or a microscopical staining agent if it contains a scheduled poison. My customers must now try to obtain such services from a qualified druggist.—I am, yours, &c., WM. HUME.

1, *Lothian-street, Edinburgh, November* 2, 1895.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

To the EDITOR.

SIR,—Trusting to be excused for trespassing upon your valuable space, may I ask for a little information for future guidance?

I have been at some pains and expense to send work to the R. P. S. Exhibition with the result that they rejected it *en bloc*. Now, I don't presume to find fault with such decision. What I wish to know is, (1) whether there be any chance at all for colonial exhibitors? (2) How is one to know what work is likely to meet with acceptance? (3) Is the Exhibition held to advertise the favoured few? With this information one could save himself the expense and trouble of sending work thousands of miles only to be given away or destroyed! I am, yours, &c.,

October 15, 1895 COLONIAL.

[We reply to our correspondent's questions as follows:—(1) Yes; if in the opinion of the Judges and Selecting Committee the work is good enough for acceptance. Surely the names of these gentlemen sufficiently guarantee that would-be exhibitors are justly dealt with? (2) Really good work is tolerably sure of acceptance at almost any Exhibition. (3) Decidedly not.—ED.]

M. ALEXANDRE'S PROCESS OF TONING LANTERN SLIDES.

To the EDITOR.

SIR,—I beg to point out that there is no novelty in the process of partially toning lantern slides as reported by you to have been exhibited by Mr. Alexandre under the auspices of the "Linked Ring." I showed results at a meeting of the Hastings and St. Leonards Photographic Society about a year ago, and otherwise both privately and publicly exhibited them—the proceeds from casual experiments since about three years. Wax partially scraped off and then removed by benzine is a crude and rather expensive plan compared with the one which I, after trying numerous materials, adopted. Bates' black varnish is all that can be desired. It may be applied to any portion without scratching, and may be finally entirely removed by soaking the slide in common turpentine.

The above method may be perfectly new so far as M. Alexandre, of Brussels, and the "Linked Ring" is concerned, but my claim to have illustrated this process a year ago can be fully substantiated both by my Society and several well-known men; amongst the latter, Mr. Weir Brown, of uranium fame, and, if you desire it, I will send you a result made about a year ago by the process.—I am, yours, &c.,

Hastings, November 2, 1895. ALGERNON BROOKER.

[Send us the result.—ED.]

METOL.

To the EDITOR.

SIR,—I notice under date, October 29, the letter of your correspondent, "K." wherein he charges metol with causing "very sore and painful fingers, and also an intense irritability of the skin of the face and neck, with a dark red rash."

I have used metol since its introduction in considerable quantities, and my habit is to put my fingers right into the developing dish in order to lift the plate. When metol-Hauff was first introduced, and when I got my fingers wet with it, I used to suffer from an unpleasant affection—a kind of "cornification"—of the parts directly acted upon by the solution; so did my assistants, and so did several others of my acquaintance. But, beyond the ends of the fingers, I have not known any one to suffer. I repeatedly drew attention of the makers of metol to this, and with the metol obtained lately—for a good many months past—I have found that I could dabble in it to any extent without damage, and I have reason to believe that the noxious impurity has been removed from the substance. In September I developed several hundreds of plates and many films in less than a week, immersing my fingers *ad lib.* in my usual way, and no harm followed. My assistants' experience is the same; so I presume it may be said that metol, as now made by Hauff, is innocuous to most people.

But there is no accounting for physiological idiosyncrasy. Many persons cannot eat shell-fish, eggs, &c., without unpleasant consequences, and "K." may have a special weakness towards metol. But it seems to me more probable that he is using an old sample, though even if so I am at a loss to explain the "irritability of skin of face and neck, with a dark red rash."

It will be a favour if "K" will communicate with me privately, and meantime he might try a *new* sample of metol. Rubber finger-guards will certainly protect him from damage.—I am, yours, &c.,

Cromwell House, Bexley Heath, Kent, AND. PRINGLE.
November 2, 1895.

To the EDITOR.

SIR,—I have used metol almost exclusively for a year, and, like your correspondent "K.," I have suffered severely from the same symptoms. I had two sores, one on my thumb and one on my middle finger, which did not not finally disappear for three months. The cure I adopted was to *entirely* avoid contact with the metol solution, frequent bathing and washing in warm water, and a free use of Vinolia cream.

I still use metol, and swear by it, but am not now troubled. I use a transparent tray with a well, which obviates the necessity of lifting the plate during development; then I lift the plate, when developed, with a common quill toothpick, and let it drain before touching it.

These simple precautions, with frequent and plentiful rinsing of the hands and a good wash when work is over, will save "K." from further trouble. Finger-stalls I find worse than useless. The irritation on face and neck must have been caused by "dirty fingers," as no gas or vapour is given off in development.—I am, yours, &c., W. J. MACKENZIE.

Glenburn House Hotel, 6, Montague-place, Russell square, London, W.C., November 2, 1895.

"AN APPRECIATION."

To the EDITOR.

SIR,—At one time when I wished for a little fun and amusement, I took up my copy of "Snippy Bits," or "Comic Shots" for perusal; but now I have discarded these and read your excellent journal whenever I wish to dispel a fit of melancholy.

Really, you are too funny. For good side-splitting jokes, dry humour, or caustic wit, commend me to your paper. Take this week's number, for instance. I started smiling at Mr. Welford's "Idle Thoughts." I know men just like the "Specialist," and the "Know-it-All," particularly the latter, with whom I cannot get a word in "edgeways." In speaking of "fighting," I did not take the writer literally, as I trust photographic societies are not degenerating into mere boxing competitions.

Funny Mr. Bachrach, he did try to "have me," but I saw through his article before I had finished. By the time I had finished this page the smile I began with had increased enormously. But it did not stop there. "Radiant" was responsible for an alarming expansion of orifice almost from ear to ear. To cap it all (and it was "capital" too), the idea of forty policemen guarding a dark tent nearly made me collapse and fall under the table with hilarity. These little jokes are very soothing to the worried and care-worn photographer.—I am, yours, jokingly,

ERNEST W. MANDERS.

Park-street, Camden Town, N.W. Nov. 4, 1895.

PROPOSED LANTERN CLUB.

To the EDITOR.

SIR,—Being desirous of forming a kind of lantern club in this neighbourhood for the purpose of giving lantern exhibitions for the benefit of charitable institutions, &c., I should be glad to hear from any of your readers who may approve of same and would be willing to join with me in forming such a club.—I am, yours, &c., S. L. WILTON.

Longmoor Villa, 158, Romford-road, Forest Gate, E., November 1, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange a 3B portrait lens, which is a good one, for a Fountain air brush complete.—Address, M. WOOLNOUGH, 19, Papillon-road, Colchester.

Will exchange first-class hand camera, twelve sheaths, quarter-plate, complete with exception of lens, also six-inch burnisher, for half-plate camera without lens.—Address, J. W. HELLIWELL, Excelsior Studio, Skipton.

Wanted, whole-plate changing bag or 8½ square old pattern dark slides in exchange for THE BRITISH JOURNAL OF PHOTOGRAPHY for 1892-4; a few missing from 1894.—Address, A. W. NESBITT, 5, Victoria-road, Blandford, Dorset.

Will exchange complete 10×8 outfit (new) for whole-plate Thornton-Pickard outfit ("Ruby" pattern); will also exchange 12*l.* 12s. concert banjo for half-plate outfit, same make as above.—Address, T. BRIGGS, 41, Park-avenue, Blackburn, Lancs.

Wanted, Fallowfield's clockwork magnesium ribbon lamp, in thorough working order, in exchange for a pair of Lancaster's narrow-angle stereoscopic lenses, with patent adjustable diaphragms and caps and brass instantaneous shutter for same; all new.—Address, W. BOND, Photographer, Magdalen-street, Norwich.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon, when some one of the Editorial staff will be present.*

PHOTOGRAPHS REGISTERED:—

J. Ramsden, 43, Granby-street, Leicester.—*Photograph of design of show-card of gloves.*

Alfred H. Cade, Hockliffe Street, Leighton Buzzard.—*Photograph of view from south of the Jubilee Gardens, Ascott House.*

W. EDMUNDS.—Thanks for the correction.

LOCKE MACDONA.—The articles appeared in the volume for 1890, and the numbers are out of print.

W. DEAN.—Such a lens can be used if you are not particular about results. A correction will have to be made after focussing for the actinic focus.

CABINET.—You surely do not read your JOURNAL, otherwise you would have seen that we have frequently referred to these free-portrait schemes. Thanks all the same.

OLD PRINTER.—We cannot answer the query. We should advise you to refer it to the advertiser. He knows what he means, and that we must confess we do not. Write him for the information.

R. E. DORAN (Cork).—The Paget Company supply a matt-surface collodio-chloride paper which, when toned by the formula supplied with it, yields results very akin to platinotypes in appearance.

PHOTOE (Mortlake).—We surmise that any of the coal-tar colours will answer for the green, and Stevens' oak or mahogany stains for the brown, but we must confess we have had but little experince in staining wood beyond a black.

C. J.—None of the formulæ for dry-plate developers will do for the wet-collodion process. If you wish to work that process, you must conform with its requirements, notwithstanding "the nuisance of having to use two or three different developers."

F. E. ROOFE.—Sorry we mislaid your original query. The sentence in the article you quote refers, or was meant to refer, to the "matting" of the collodion film in the process of manufacture. On this point we are not in a position to give information.

STAFFORD.—If you entered the service a month on trial, you can legally be discharged at the end of that time. The agreement was only for a month, and terminates at the end of it. It will be no use to sue for a month's wages in lieu of notice, as you are not entitled to it.

R. S. E.—The cause of the precipitate, when the chloride of gold was dissolved, is that either impure water was used or the bottle in which the solution was made was dirty or contained some impurity. To recover what gold remains after the bath was made will not be worth the trouble if time be of any value.

S. ROBERTSON.—Spirit at 60 o.p. is not strong enough for making collodion for the wet-collodion process. It will do very well for the iodising solution if the normal collodion be made with alcohol of s.g. ·805. That strength of methylated spirit will do well for the varnish, though a strong one would be better.

T. GARDNER.—If the collotype plate be ground, and the process worked as usually directed, there will be no fear of the film peeling off. The plates may be coated on the polished surface, and good results obtained, but it is much better to use the ground surface. We should advise you to master the process as it is before trying to improve it.

G. WATSON.—One of two things is certain, either the lens is not adjusted at its proper focus in the camera, or the slides are not in proper register with the focussing screen by which it was focussed. There may be another cause, however, for the unsharpness of the negative, namely, that the lens does not work to focus, *i.e.*, the optical and chemical foci are not coincident.

C. C. H.—If the spots invariably make their appearance when the hyposulphite from one cask is used, and not when it is taken from the other, it is but a fair assumption that the former sample is faulty, and therefore should not be used. With these facts before him, we are surprised that your employer insists on its use. If the case be as stated, he certainly should not charge your manipulation with the spottiness.

D. G. THOMAS writes: "Can you assist me in the following questions:—1. Is it possible for me to get good photographs by gaslight? 2. What kind of burners will be the best to use, and what number will be required?"—Presumably portraits are meant. The answer is, Yes. The Welsbach burner will be the best to use. From twenty-five to thirty will yield very good results if the lights are judiciously arranged.

PHOTOPHIL.—1. Either the silver bath is out of order or the plates were not properly cleaned. Much of the tendency of the silver to precipitate during the development is due to redipping the plate, which is quite unnecessary, and should be avoided if you wish for good results. 2. Yes; see Hardwich's *Photographic Chemistry*. 3. Refer to the formulæ on page 837 of the ALMANAC for the current year. There you will find formula for collodion.

G. B.—1. The lens is not well adapted to the work; one of much longer focus would be preferable. 2. Objects can be photographed the same size as in nature if the lens be placed near enough. The object must be at the same distance from the lens as the sensitive plate is from the latter. 3. By placing the camera in such a position that the objects can be most distinctly seen. 4. Until the film is set sufficiently to take an imprint of the finger and retain it.

W. G. S. (Rangoon).—There are so many hand cameras now in the market, all of which, except perhaps the lowest-priced ones, are efficient. We should recommend a focussing one, with the focus for different distances marked on a scale for use with hand exposures. Some prefer a twin lens, when price is not a consideration, and others the camera fitted with a finder. We should advise you to get prospectuses from a few of the manufacturers and then judge what will best suit your requirements.

WARDLEY.—There is no copyright in the original engravings; that has expired many years ago. But there may be, and very probably is, a copyright in the photographs of them, and it is these we assume that you propose to reproduce as lantern slides. If you do that, you may find yourself involved in law proceedings. If you want slides of these subjects, you must copy the original engravings, then there will be no risk. With regard to the German copies of English paintings, you may rely upon it that there is a good copyright in them.

CONTENTS.

	Page
A BUSINESS TOPIC	705
THE ECONOMICAL USE OF THE FIXING BATH	706
JOTTINGS. By COSMOS	708
IRON IN PLATINUM PRINTS	709
PICTORIAL TREATMENT OF LANDSCAPE. By H. A. MUMMERY	709
THE TINTOMETER	712
THE STABILITY OF PRINTING-OUT PAPERS. By DR. MAXIMILIAN TOCH	712
THE PHARMACEUTICAL SOCIETY AND PHOTOGRAPHIC CHEMISTS	713
THE PRINTING AND TONING ROOMS. By C. L. WEED	714
BURNISHED OR MATT-SURFACE PICTURES	715
OUR EDITORIAL TABLE	715
NEWS AND NOTES	715
RECENT PATENTS	716
MEETINGS OF SOCIETIES	71
FORTHCOMING EXHIBITIONS	718
CORRESPONDENCE	718
EXCHANGE COLUMN	720
ANSWERS TO CORRESPONDENTS	720

THE BRITISH JOURNAL OF PHOTOGRAPHY.

No. 1854. Vol. XLII.—NOVEMBER 15, 1895.

It is with great sorrow, which we are sure will be very widely shared, that we announce the death of Mr. J. Traill Taylor, the Editor in Chief of this Journal. Mr. Taylor had recently gone on a visit to Florida, where he possessed an orange grove, and it was at Lane Park, in that State, that he passed away on November 8th, succumbing, we learn by cablegram, to an attack of dysentery. Letters that had lately been received in this country from him indicated that he was in good health and spirits, and looking forward to a speedy return. But Fate willed otherwise, and he now lies buried near the little Southern property with which his associations had been of a peculiarly pathetic nature, and that culminated in his death there, remote from his relatives and the many friends among whom he had very shortly looked forward to passing the years of his well-earned retirement. A memoir of the deceased gentleman will be found on page 725.

STEREOSCOPIC SLIDES FOR THE MILLION.

It is a source of perennial wonder, to those who took an interest in things photographic a little over thirty years ago, that the enormous demand that existed for stereoscopic slides at that little remote period should have so utterly collapsed, as for a long number of years it did. Scarcely a house in the country but was provided with its stereoscope and its set of slides, but when *cartes-de-visite* and albums to contain them came in, stereoscopic slides went out. Probably the true cause of the decay of stereoscopy may be not one, but many; but it cannot be doubted that one prominent factor was that, although the slides were produced in abundant variety, it yet remained a fact that the variety, great as it was, soon became exhausted. People could not go on buying slides for ever, and to see, with little variation, virtually the same subjects in every house we entered became an almost insufferable nuisance, till at last people gave up the whole thing. But now, as with almost every other person we meet the possessor of a camera, why do we not see a recrudescence of slide-production?

No doubt we shall be told "because, although most people have a camera, few people have one suitable for stereoscopic views." We wish to show that this difficulty is purely imaginary. Notwithstanding all that has been written, photographers, amateur and professional, cannot disabuse their minds of the belief that to take and to print a stereoscopic slide means "such a lot of bother" that they will not take the trouble, and certainly will not go to the expense they believe to be involved.

Now, it is worth while considering for a moment what are the essential properties of a stereoscopic slide. They are much simpler than is usually imagined. Such a slide is merely two specially taken and almost identical level and straight pictures of one subject, mounted on a card at a certain distance apart. As this distance is about two and three-quarter inches apart, the pictures for the ordinary instrument cannot be wider than, that rather small number of inches, though there is no limit to their height. We say almost identical; the only difference is that one picture is photographed from a standpoint slightly to one side of that from which the other was taken—that is all To get this variation of standpoint, it is usual at the present time to take the two pictures with a camera having two similar lenses—twin-lens cameras they are often called. This is the stumbling-block to so many. We wish to show it need not be. In the very earliest days of stereoscopy the negatives were always taken with a one-lens camera; one view was taken, the camera shifted to right or left, and then the second view, both on one plate for convenience' sake. All sorts of elaborate contrivances gradually came to be devised for moving the camera mathematically exactly in a line about at right angles to the axis of the lens, and larger cameras were invented which enabled the same lens to be used by moving it to one side for the next view after the first had been taken. No more beautiful slides have ever been produced than those taken by the one-lens camera.

But let it be remembered that, although it is a good thing to have a mathematical certainty as to getting precisely the same view included in each of the two negative impressions, a considerable deviation from this mathematically correct standard is permissible. Nearly all stereoscopic negatives were taken on glasses so little larger than the actual stereoscopic pictures to be printed that, if there were much deviation from what may be termed actual centering, there would not be sufficient subject included. But we have changed all that. Most amateurs have at least a quarter-plate camera, which gives a variation of three quarters of an inch in either direction, and still permits one stereoscopic-sized print to be cut out.

We have now come to our point. Every little quarter-plate hand camera has the possibility and the potency, to use a once-famous expression, of an endless series of stereoscopic views. It is not necessary even to use a stand. Let the user

take one view of the selected subject, step a few inches to the right or left, and take a second. He then has all that is necessary for producing a perfect stereoscopic view. If he hold his camera in the same position, its vertical height from the ground is not likely to vary to any extent sufficient to interfere in the slightest degree with the easy coalescence of the two views in the stereoscope. Could anything be simpler? Our readers who possess the cheapest camera possible may now set to work and take stereoscopic views as well as simple single ones, and for half-a-crown may purchase an excellent stereoscope capable of fulfilling every reasonable requirement. The finder, with which every modern hand camera is provided, has revolutionised the process. He must indeed be an indifferent worker who cannot take two views on quarter-plates, to include the same subject with three quarters of an inch allowance on either side, and, if he be not expert enough to keep his perpendicular right by hand work, tripods and holders can be used which are both simple, light, and cheap.

We foresee the one possible objection that can be made. It may be said that moving figures cannot be so taken, as they would alter their position between the two exposures. This is quite correct, and a fatal objection, as far as it goes. But, if any one will look up a set of the finest slides produced in the period of the stereoscopic "boom," he will find an exceedingly small number with moving figures in them. Processes were not quick enough in those days to take such views, street and otherwise, as are now snapped without the slightest difficulty; but the results were exquisitely beautiful, and can be easily repeated in the manner we have now shown.

But even this objection may be met. If such moving objects are required to be taken, all that is needed is to use two cameras fastened, let us say, side by side, and arranged to be simultaneously "snapped." The photographer will be very little more weighted than he who uses a twin-lens camera, or, when ordinary landscape and architectural work only is required, he can leave his second camera at home. Again, there are now on the market, several miniature hand cameras outside the category of toys. Two of these strapped together, or even temporarily united by the familiar "elastic band," will give excellent views of a small size. It is by no means necessary that the two views should reach the size of two and three-quarter inches, that is merely a maximum; there is no minimum. If they are too small, it is a very simple matter to enlarge them, either by a negative or by developed bromide paper.

We trust we may now have offered sufficient food for thought to enable us to anticipate in the near future a vast accession to the ranks of stereoscope lovers.

REVERSED NEGATIVES ON GELATINE PLATES.

Since we alluded, a few weeks ago, to the process for producing reversed negatives by a single operation, several correspondents have written to complain that they are unable to succeed, and asking for explanations as to the cause of failure. These are in each case easily given, as, in every instance except one, the attempt has been made with gelatine plates, while in the last a wet-collodion plate had actually been used. Now, the first principle of this method is the removal of an image developed upon a pure bromide plate by means of alkaline pyro, or similar developer, in which case the silver bromide that has been reduced to form the primary image is entirely removed, leaving a reverse image in unreduced bromide, to be submitted to a second development to darken it. As the development of an ordinary wet-collodion plate with ferrous sulphate and acetic acid does not reduce the silver *in* the film, but deposits it from the bath solution left on the surface of the plate, the only effect of dissolving off that image is to restore the film to its original condition before development.

Besides this, the every-day wet-collodion film consists chiefly of iodide of silver with only a small proportion of bromide, and, though the fact of the plate having been prepared with the bath does not militate against success, the presence of iodide of silver does, as this salt is very little subject to reduction by alkaline pyro, at any rate under ordinary conditions. The result, therefore, of washing an ordinary wet plate to remove the free silver and developing it with alkaline pyro or ferrous oxalate, which is quite feasible, would be the formation of an image chiefly at the expense of the small proportion of bromide it contained, and when this was removed the unreduced iodide would still remain to fill up the shadows. This, it is true, could be removed by fixing after the second reduction, but the trouble involved in preparing the thin image finally obtained, to fit it for intensification, would render the whole operation a more irksome one than the usual plan of making an intermediate transparency.

Theoretically, there is no reason why an ordinary gelatino-bromide plate should not be as well adapted to the process as a collodion plate, provided it contained no iodide, when, of course, the same objection would arise as in the case of bromo-iodised collodion. But practically gelatine plates are not available, for reasons solely connected with the physical character of the gelatine. Some twelve or fifteen years ago, when first experimenting with ferric sulphate and iron alum in place of nitric acid, which had been previously used for dissolving the first image, but which, owing to its solvent action on the gelatine, was practically unavailable with such films, we were struck with the anomalous behaviour of the new solvent. Although with collodion emulsion films it worked even more perfectly than nitric acid, with gelatine, for which we had thought it more particularly suited, it apparently behaved in identically the same manner as might be expected if the image was *on* instead of *in* the film, that is to say, it restored the appearance of an undeveloped plate.

It was, of course, impossible that the metallic silver, by treatment with sulphate of iron or any other sulphate, could be converted into bromide, though at first it looked very like it; but, on further investigating the matter, we found that the appearance was practically due to the formation of a basic iron salt which much resembles the colour of "cooked" silver bromide, and which attaches itself firmly to the gelatine in contact with which it is formed, though, in the case of collodion, this does not occur. Thus, in treating a gelatine plate with iron alum, as soon as the surface image is removed to a certain depth, the yellow colour of the deposited iron salt entirely hides the undissolved silver underneath, and, except under close examination in daylight, it is impossible to distinguish the plate from an undeveloped one. If the action—which is very slow with gelatine plates—be continued sufficiently long to dissolve the whole of the silver image, the plate will, when examined by transmitted light, exhibit a positive image of a brownish-yellow colour if printed from a negative, or *vice versâ*—in other words, an image of the same character as the one removed, though differing in colour, and this will remain, whatever treatment the plate may be subsequently submitted to. The silver image is, in fact, replaced by one of

iron, that clings so tenaciously to the gelatine, and is, moreover, of such a refractory character, that no treatment that will not destroy the gelatine will remove it.

The only means likely to render the iron salts available for the removal of the image from a gelatine plate seems to be to prevent, if possible, the formation of this objectionable basic compound. With this object in view, we have experimented upon spoiled negatives with a solution of iron alum, strongly acidified with different acids, including citric, hydrochloric, oxalic, and sulphuric, in order to ascertain whether it is possible to remove the silver without replacing it with iron. So far as our experiments go, it seems to be merely a question of how much the gelatine will stand in the way of treatment with acid, as, in the case of an abnormally tough film, a sufficient strength of acid may be used to keep nearly the whole of the objectionable iron in solution as it is formed, but in the majority of cases the result resolves itself into a substituted image of greater or less strength, according to the particular circumstances.

As we have already remarked, the action of the iron alum upon a gelatine film is extremely slow as compared with collodion, owing to its hardening or tanning action. This latter, however, is beneficial, in so far as it, to some extent, counteracts the softening, as well as the loosening, effect of the acids upon the film, and thus it happens that a quantity of citric acid may be applied in combination with the iron that, without it, would have the film off the glass in a very short time. The best results we have obtained are with citric acid, as, having no particular solvent effect upon the gelatine, it permits a very long application of the mixed iron solution. Hydrochloric acid comes next, as, without exercising so strong a solvent action as sulphuric, its own effect in converting the silver into chloride hastens its removal and shortens the process, thus reducing the amount of stain; but in the case of a reversed image the chloride of silver remains in the shadows, though it might be possible to remove it by one of the methods to be subsequently mentioned. Oxalic acid does not offer any prospects of utility.

Although we are not prepared to deny the possibility of entirely removing the silver image without leaving traces of iron, we have not succeeded, in the course of our limited experiments, in doing so. In every case there has remained a delicate, mostly transparent image, varying in colour from pale yellow to golden brown, and very often closely resembling the transmitted colour of an orange bromide emulsion. The substituted image is, in fact, a very pretty one, but would be decidedly out of place, filling up the shadows of a reversed negative. We have not extended our trials of the acid-iron solution to unfixed plates, so cannot describe the appearance of such when so treated. It is quite within the bounds of possibility that by this means negatives may be obtainable that would be capable of use for some purposes and with some printing processes; it is probable even that in the case of very hard negatives so reproduced the prints might be superior, but for general work—and process work in particular, especially where asphaltum is the medium to be acted upon—we fear the iron-alum method cannot be used with gelatine plates.

The question has been asked whether any similar method exists by which the original image can be dissolved away leaving the unreduced bromide to form a "contre-type." The old plan with nitric acid seems to us the only direct one; but, owing to the powerfully corrosive nature of the acid, it is scarcely of any practical use with gelatine. In the concentrated condition, or even at the strength that might be used with collodion, it would instantly dissolve gelatine, while, if sufficiently diluted to avoid immediate danger to the gelatine, the action on the image is reduced to practically *nil*, while the insidious softening action during the protracted treatment is almost as bad in result as the concentrated solution.

If the reversed image is to be arrived at in this way it will, we think, have to be by a modification of the original plan, a process of conversion previous to solution of the original image. For this purpose, we believe, from a few experiments we have made, that, by utilising the different degrees of solubility of bromide and chloride of silver in certain menstrua, the image may be removed by first converting it into chloride of silver, and then dissolving the chloride in a solution too feeble in its action upon bromide of silver to seriously affect the unreduced portions of the film.

For the purpose of conversion, a variety of agents may be used, simplest and safest of which is chloride of copper, which can be improvised from a mixture of common salt and sulphate of copper, when the cupric chloride is not obtainable. This has absolutely no injurious action on the gelatine, and, if it exhibit any tendency to stain, it will be, we think, only from carelessness on the part of the operator. Chloride of iron—ferric chloride—acts in a similar manner to the cupric salt. Dilute hydrochloric acid leaves an image of pure silver chloride, as does its mixture with bichromate of potash, which acts more energetically, as well as more regularly, in dilute solution, but they are liable to the objections to be urged against all acids. Probably, in mixture with alum, the hardening action of the latter would suffice to counteract any injurious tendency, and, as there is no particular reason to hurry the operation, the solutions may be sufficiently dilute to be within safety. Last, though rather a favourite with us, is the mixture of nitric acid and common salt referred to in the same article, in which the reversal process was previously mentioned. This works with great steadiness in a very dilute condition, and appears to act far more energetically, in proportion to the quantity of acid present, than either nitric or hydrochloric alone, of which it is practically a mixture.

The image having been converted into chloride has now to be removed without disturbing, any more than can possibly be helped, the bromide of silver with which it is surrounded, every atom of which is of importance as contributing to the density as well as the gradations of the final image. Of the various agents in which chloride of silver is soluble, we think there is scarcely one in which bromide of silver is not also dissolved to some extent, though in most cases to a less degree. Hypo is clearly out of the question, as the difference in the solubilities of the two haloids in that solution is insufficient. Sulphite of soda presents a wider difference, and by a protracted immersion in a weak solution of that salt we have obtained a fairly good result. Ammonia exercises a powerful solvent action on chloride of silver, and a much weaker on bromide, and this, if employed in sufficiently weak solution to obviate injury to the gelatine film, forms a useful agent. But perhaps best of all, if used with patience, is a saturated solution of common salt, which, as many of our readers will remember, was formerly used as the fixing agent for positive prints prior to the introduction of hypo, and has even within recent years been put forward in preference to our "old enemy." Its solvent action on silver bromide is comparatively small, especially when surrounded by gelatine; and this, we think, will be found the best agent to employ.

It has suggested itself to us as we write that possibly a mixture of hydrochloric acid, of proper strength, with a saturated solution of salt may answer the purpose in one operation, or a mixture of bichromate of potash and hydrochloric acid with salt, though the chlorising action of the latter would probably be too rapid for the solvent action of the salt. In the former case, as the image was chlorised by the acid, the newly formed silver chloride would, we believe, dissolve while in the "nascent" state in the chloride of sodium, and the process be not only shortened by one operation, but also materially hastened by the fact of the presence of the solvent at the moment of the formation of the chloride, on the same principle that a very weak solution of silver nitrate may be dropped into a moderately strong one of salt without forming a precipitate. At any rate, the plan is worth a trial.

In conclusion, we may remark that the plan of reversal by the removal of the developed image possesses attractions that do not attach to any other, and, when the principle is thoroughly understood and some little experience gained, it is more reliable in its results than any other.

Improving Negatives.—At several societies of late the subject of "dodging" or improving negatives has formed the topic for discussion, and also for demonstration. It is not a little surprising that the general run of amateurs pay so little attention to the improvement of a negative after it is once taken. There is no necessity to enter into the question as to whether dodging a negative is legitimate or not; we take it that the end justifies the means, and that there are few negatives so perfect that they cannot be improved to some extent. At most of the societies only what may be termed the chemical methods were dealt with. The mechanical method seems to a great extent to have been ignored. Yet this system is the one most generally in vogue with professional photographers. It has the advantage that there is no risk of injury to the negative, as there always is in locally reducing or intensifying by chemical means, as many have found to their annoyance. It is surprising what can be done with matt varnish, mineral paper, tinted collodion, &c., in the way of "local treatment." Further reference, of a practical nature, may be made to this part of the subject on a future occasion.

The Gas-cylinder Inquiry.—Evidently users of compressed oxygen are getting impatient for the report of the Committee appointed by the late Home Secretary to inquire into the subject of compressed gases, cylinders, &c. As the lantern season advances, so do the number of letters we receive on the subject increase. One correspondent says: "Surely any Committee on so trivial a matter as this should not require half a year to deliberate upon it before making a report." Another correspondent writes to the similar effect, and adds that, "if the report be much longer delayed, supposing it to be favourable, it will be too late to influence the railway companies so as to be of much advantage this winter." There is much in what these and other correspondents say, and regrettably so; but it must be borne in mind that committees of this kind never seem to hurry, also that the report has to be made to the Home Office, where things always proceed slowly, from where it is issued to the public. As we have said before, it does not follow, whatever may be the tenor of the report, that it will have any weight with the railway companies and their restrictions as to the carriage of charged cylinders. Be that as it may, the report should have been before the public ere this.

Prices of Chemicals Now and Then.—In his address at the annual meeting of the Newcastle Photographic Association, the President referred to the difference in price of nitrate of silver now and in times past, mentioning that when he commenced photography he had to pay from 4*s.* 4*d.* to 4*s.* 6*d.* per ounce for it, whereas he now paid but 1*s.* 9¼*d.* for the same thing. Great as has been the reduction in the price of nitrate of silver, it is not nearly so great as it has been in many other of the materials used in the art. It may be interesting to modern photographers to know what their older brethren had to pay for some of the chemicals most in use. In a price-list of forty years ago, of a house then noted for its low prices, now before us, nitrate of silver is quoted at 5*s.* per ounce and the chloride of silver at 10*s* 6*d.*; pyrogallic acid, sixty grains in bottle, 2*s.* 6*d.*, or 16*s.* the ounce; bromide of ammonium, 8*s.* an ounce, and the iodide, 5*s.* Iodide and bromide of cadmium are quoted at the same price as the bromide of ammonium. Then hyposulphite of soda was 2*d.* per ounce, or 1*s.* 4*d.* a pound; and absolute alcohol 10*s.* a pound. At the time referred to, the prices of photographic chemicals had been considerably reduced from what they had been previously. An old photographic acquaintance of ours tells us the first hyposulphite of soda he bought he paid 6*d.* per ounce for, and the first pyro 4*s.* a drachm. At that period photography was an expensive pastime for amateurs, particularly if the high price then charged for the apparatus be considered.

The Pharmaceutical Society and Chemists.—Our readers will remember that a few weeks ago we made some remarks on the action of the Pharmaceutical Society in Edinburgh anent the prosecuting two photographic chemists—Messrs. Turnbull & Hume—for unlawfully using the term "chemist," they not being registered under the Pharmacy Act. If they do not remember the fact, they are reminded of it by a report, and also a letter from one of the defendants, Mr. William Hume, in our last issue. The Court before which the case was first brought decided that the use of the terms "photographic chemist" and "technical chemist" did not come within the scope of the Act. Against this judgment the Society appealed, and it has gained the day, though not with honours. The Appeal Court was governed by previous cases in England, but, as expressed, reluctantly. We presume it would not be worth the while of either Mr. Hume or Mr. Turnbull to take the matter to a higher Court; but, if they did, there is every probability that the ruling of the Appeal Court would be set aside—that is, if common sense prevailed. Referring to a standard dictionary, we find *chemistry* thus defined: "The science which relates to the elements of matter, the proportions in which they unite, the means for their separation, and the laws which govern and affect these agencies," and *chemist* defined as "one versed in chemistry." It would be very interesting to learn what proportion of the "duly qualified," according to the Pharmaceutical Society, are *chemists*. How often has the local druggist told the trusting amateur photographer that sulphite of soda and the hyposulphite are the same thing. A few years ago we had occasion to go to the local "chemist,"—whose certificate from the Pharmaceutical Society was duly framed and glazed, displayed in the shop—for some bicarbonate of soda. This chemist smiled, and told us we meant bicarbonate of potash, and, on our dissenting, he told us there was no such thing as bicarbonate of soda. It is nearly thirty years ago since the present Pharmacy Act was passed, and it is now time that it should be amended, so far as the title of "chemist" is concerned. If we refer to the Post Office Directory, we find we have "analytical chemists," "metallurgical chemicals," "agricultural chemists," "consulting chemists," "operative chemists," &c., who are actually chemists in every sense; but, according to the Pharmacy Act and the decisions upon it, they are using the term "chemist" unlawfully. If those two important bodies, the Chemical Society and the Society of Chemical Industry, were to use their influence with some of those Members of Parliament who are interested in scientific matters generally, the law as relates to the use of the term "chemist" would soon be altered. By the way, as we have said on previous occasions, the Pharmaceutical Society is really a trades union, and uses its privileges as such, particularly amongst photographic dealers. If the medical societies were to assert their rights as does the Pharmaceutical Society, they would fare badly with the majority of their licences for prescribing medicines which they are not entitled to do. Coroners and their juries have often had something to say on that subject.

THE
JOHN CRERAR
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J. TRAILL TAYLOR.

BORN JANUARY 23, 1827. DIED NOVEMBER 8, 1895.

In Memoriam:
THE LATE J. TRAILL TAYLOR.

THE late Mr. Taylor was born at Kirkwall, in the Orkneys, on January 23, 1827, and was thus a few months short of completing his sixty-ninth year. As a youth he was attracted to and practised the Daguerreotype process, and, in the intervals snatched from the pursuit of his profession as a watchmaker, developed great aptitude for the study of the chemistry and optics of the then very young art of photography. We have frequently heard him smilingly remark that in those days there were no photographic papers to help a young photograper out of his difficulties, and that of the optics of photography, a field in which he was subsequently destined to gain considerable prominence, it was difficult, if not impossible, to acquire knowledge from others.

A long residence in Edinburgh was the means of bringing Mr. Taylor into contact with Sir David Brewster, Henry Fox Talbot, Mungo Ponton, Piazzi Smyth, R. H. Bow, Thomas Davidson (the optician), and other noted workers of forty years ago, by whom he was highly esteemed for his knowledge of photography and his abilities as an experimentalist and writer. For some time, we believe, he was on the staff of *The Scotsman* and other Scotch newspapers, and dated his first association with photographic journalism from about the year 1856, when he established an ever circulator magazine, devoted to photography and called *The Photographer*, many extracts from which will be found in the earlier volumes of *Photographic Notes*, edited by Thomas Sutton, B.A., between whom and our late friend a warm regard subsequently sprang up.

It was in the year 1859 that Mr. Taylor became a regular contributor to this JOURNAL, and thus started a connexion that was only to terminate with his death. Five years later—that is in 1864—on the retirement of Mr. Shadbolt, he was appointed editor, a position he filled for the succeeding fifteen years. It will be within the recollection of most of our readers that, in the early part of 1879, he vacated the Chair for the purpose of taking a commercial appointment in the United States, and that before his departure a numerously attended farewell dinner and a handsome gold watch were offered to him as marks of the esteem in which he was held by the photographic public. Circumstances deciding him to abandon his new position about a year after his arrival in New York, he resumed his connexion with photographic journalism, taking up the editorship of the *Photographic Times* (New York), which rapidily prospered under his skilful direction, and also contributing to this JOURNAL of which, together with its ALMANAC, he once more assumed the editorship on January 1, 1886.

Some of Mr. Taylor's optical writings were published in book form a few years ago, but they are not fully representative either of the extent or the depth of his knowledge of the subject. But happily it is not necessary for us, in dwelling upon the vast store of his photographic knowledge and experience, the directness and simplicity of his literary style, his sagacity as an editor, to do so specifically or in detail—the volumes of the JOURNAL and the ALMANAC, for over a third of a century, eloquently tell the story of his life's work, and constitute what we know he himself would regard as his best, most enduring, and proudest memorial.

Outside his journalistic labours the world of photography has cause to be grateful to Mr. Taylor for many efforts and labours in its behalf. Over thirty years ago he was, we believe, one of the founders of the Edinburgh Photographic Society. In London he was for a long time a Member of Council of the Royal Photographic Society; Trustee of the London and Provincial Photographic Association; President of the North London Photographic Society; and an Honorary Member of the Photographic Club and the Camera Club. He was formerly President of the Photographers' Benevolent Association, and was the founder of the Photographic Convention of the United Kingdom. Many other photographic societies in America, in France, and other parts of the Continent, claimed him as a member. Until within the last year or so he frequently read papers, or gave what he loved to call "short talks," on photographic optics and allied subjects before several of the societies named. Failing health, however, obliged him to largely forego a great many of his public appearances, and to resign a considerable share of his journalistic duties to other hands.

And not only was his a long and busy life, but it was also marked by variety and versatility of pursuit. It is not generally known that about forty years ago, when he lived at Dumfries, he took a leading part in popularising Pitman's Phonography. His knowledge of books was an extensive one, and he had great mechanical skill and was an adept at lathe work. Strongly attached as he was to the journalistic profession, he numbered innumerable friends in high positions on the non-photographic press, many of whom owe not a little of their success to his kindly support and encouragement.

The popularity Mr. Taylor enjoyed among the many thousands of photographers with whom he came into contact during the course of his long career is not difficult to understand. He was ever genial, communicative, and kind-hearted, ready to help with advice, counsel, or information, the *beau-idéal*, in fact of natural *bonhomie* and good humour. Of the many who will be pained at the news of his very sad death, there is, we are confident, scarcely one who will not treasure up some little act or word of his by which they have profited.

Upon those of us who have been intimately associated with him in the editing of this JOURNAL the blow of Mr. Taylor's loss has fallen heavily and suddenly, for death has robbed us of a wise and true friend, and a beloved and indulgent chief, whose memory and good qualities we shall ever cherish and esteem.

The late Mr. Taylor was predeceased by his wife about five years ago, but he leaves three sons and one daughter, to whom their loss will bring the sincere sympathy of their own, and their late father's, many friends.

FILMS AND HOW TO WORK THEM.

After another season's work with rollable films, I am inclined to think that some improvement is to be chronicled in connexion with them.

One of the chief points so often levelled against films, namely, their obnoxious habit of *curling*, is made often with quite insufficient knowledge of the facts, and without taking into account the remedy to be adopted to ensure an evenly dried and flat film. You can no longer, at any rate with comfort or success, develop a film in a *test tube;* and, again, though still liable to vary in thickness, some spools being considerably thicker than others, this does not affect the general result, and they are not on that account any more difficult to work.

In the choice of a developer there is room for much discrimination. The pyro developer recommended by the makers is, as may be supposed, very good for the purpose It acts quickly, gives ample density in a reasonable time, and is fairly clean. Metol and hydroquinone, together or separately, are also good. Amidol or glycine, freshly made, give, however, I think, the best results—beautifully clean negatives, with full detail and as much density as may be required; last, but not least, negatives which may be termed good printers.

On the whole, I have most faith in the two latter, although it would be difficult accurately to define where any important difference lies. I prefer the colour of the negative yielded by amidol or glycine to that which comes by the use of pyro. Metol, I am sorry to say, plays such havoc with my cuticle that I have had practically to discontinue the use of this valuable developer altogether.

Nothing could very well be better than amidol unless it be glycine. You could not improve upon glycine, but amidol will come up to the same high level, from which it may be inferred that either of these reducing agents may be employed with equal success.

The development of a spool of exposed films requires more care and skilful manipulation than does a batch of dry plates. It requires particular attention to cleanliness of person, chemicals, utensils and surroundings. If a person cannot cut up (and I have met such), say, a sheet of sensitive paper without making a mess of it, with finger marks and other surface contaminations, he must decide to let films alone.

In the first place provide a light-tight box to hold the cut pieces of film; a pair of shears, and a piece of clean brown paper on which to cut up and divide the spool. The pieces as cut are placed in the box, face down, until required.

Now get ready three or four deep porcelain dishes, two of clean water, one of these being used to soak the films before development, the other to receive them after this operation is concluded. In one of the other dishes place sufficent developer, made up rather below the normal strength, to fill the dish to the depth of an inch, and in the other a supply of solution of quite full strength.

In the first washing water may be plunged, one at a time, six pieces of exposed film, face down; they curl slightly at first, but soon straighten themselves; be careful to see that they do not adhere to the bottom of the dish, or to each other; to prevent this they must be, of course, moved about now and then to let the water thoroughly soften and permeate the film; air bells also must be cleared off.

This done, the films may be taken one at a time and dropped face down into the developer (the weaker), moved about a bit, and then as soon as an image commences to appear, which will occur in a few seconds, a second and third film may be added to that in the dish, and development will go on slowly, but quite steadily, to completion. The films are to be moved about without haste or undue roughness, on no account must they be allowed to rest one over, or partly over, the other without being constantly but carefully shifted, just as in toning prints. If density is somewhat longer than usual in reaching a good printing standard, as judged in the usual way by transmitted light, then a few minutes in the stronger bath may bring about the desired result. With a fresh bath, however, or one which has, perhaps, only been once before used, time only is required to get the full effect. It is safe to say that any amount of density is to be got with either of these developers, and, even if a film takes twenty minutes to attain full density, there is no sign of stain, nor, other things being equal, fog.

I don't advise the worker to attempt more than six at a time, six are about as many as one can comfortably keep an eye upon, to give them anything like reasonable treatment.

It is, of course, quite possible that some may require slightly modified treatment to produce the best negatives; but, starting with the under-normal developer, and finishing off those that require it with a short immersion in the stronger bath, will, as a rule, cover all average exposures, and give as high a percentage of good negatives as can reasonably be expected. Rollable films do not, so far as my experience goes, often suffer from under-exposure. I cannot remember, at the present moment, one which exhibited to any appreciable extent any trace of under-exposure, but I have had from the use of a shutter, not easily regulated, and not fast enough, many films which were over-exposed, and by the use of other developers than glycine or amidol, over-developed, foggy, and flat.

If over-exposure is thought to be a certainty, and *it will be* most assuredly (if the camera is fitted with a fixed stop and one speed shutter) at certain seasons of the year, then a "restrainer" will be a necessity. Mere dilution with water will not always take the place and answer the purpose of a trace of bromide in the developer. Under such circumstances, a ten per cent. solution of bromide of potassium will be found just the thing needful, a few drops of this being added to the developer before use. I should say that from June to September bromide should be used, in the event, as I have remarked, of the camera being one which allows of no regulation as to speed of exposing arrangement. For the rest of the year I think bromide may be dispensed with.

It seems an extraordinary thing, particularly with films, that outfits are sold with no means for regulating the amount of light which is to enter and impress itself upon the sensitive material. The light alters and varies tremendously, but the sensitive surface and the speed of the shutter remain constant, which is, to say the least, absurd.

The films, as developed, are removed to the second bath of water, and, after gentle movement, may remain until all are finished. The fixing bath is to be of the usual strength, four or five ounces to the pint; and here I may remark that films developed with the amidol or glycine solutions do not lose much of their strength in fixing; in fact, sometimes they will turn out rather stronger than was looked for, a fault, perhaps, on the right side, as they can be easily reduced.

Foggy, over-developed, and rather flat negatives will be very much improved by treatment as follows, the process being, of course, by no means new or original. I invariably finish off and dry all the negatives first, then put on one side such as I think require intensification or clearing, as this can be judged of leisurely and in daylight. The process is by no means original, none other than the use of Howard Farmer's ferridcyanide bath, followed by intensification with mercury:—First immerse in water and thoroughly soak the negatives, then place them, *one* at a time, as the treatment is very radical, and may have important results, in the clearing bath, viz.—

Hypo solution	1 part.
Water	9 parts.
Potass ferridcyanide (saturated solution)	a few drops.

This quickly clears off all fog and brightens up the image very considerably. As soon as this result is reached remove the film at once to a dish of clean water, and proceed to operate on another. After complete washing they are simply immersed for longer or shorter periods in the mercury bath, and, after more complete washing and soaking, are blackened with ammonia, this being I think more satisfactory than soda sulphite solution. Then, after more washing comes a repetition of the finishing bath which keeps the films from drying very hard and curly. Go over each film separatly with wet wool and place in the glycerine bath, half ounce of glycerine to thirty ounces or so of water, let them remain five minutes, then remove and place face up, on clean blotting-paper on a sloping board, and they will dry in a few hours. The result is a series of negatives simply perfect as regards cleanliness, density, and printing qualities.

The operation of development invariably leaves, or tends to form some surface stain or veil on the face of the negative; some of it will be removed, no doubt, by means of gentle rubbing with wet wool, and of course it is not always plainly visible to the untrained eye. But the veil is there in nearly all cases. Some photographers believe, I think, that a little "fog" improves a negative, but my opinion, which may be taken for what is worth is that in a great many cases this veil will make all the difference between a good and a bad or poor negative and is therefore always best removed. This can be most expeditiously done by the use of the clearing bath mentioned above, and most decidedly if intensification has to be resorted to, always *precede* it by application of the clearing bath.

When dry, back and front, film negatives may be trimmed to a uniform size, and placed in envelopes, labelling these on the front top edge, and if kept under a little pressure for a short time will be likely to give no further trouble in the way of curling.

One disadvantage of films is that, in the event of anything serious in the way of blocking out being required, they are somewhat awkward to handle, and I have not met with any opaque colour so

entirely flexible as to be quite perfect, but, if kept moderately flat, it will be hard to beat Gihon's opaque as a colour for this purpose.

For enlarging purposes in the lantern, &c., I mount the films (the small ones) between very thin glass plates, using a *metal* lantern-slide binder, which is easily removed and replaced, and holds the negative in perfect contact with the plane surface during the time required.

Finally, I may say that I have never found occasion to modify, except by dilution with water or the occasional addition of the bromide restrainer, the formulæ given by the makers for the amidol or glycine developers. J. PIKE.

ON THE SENSITISING ACTION OF DYES ON GELATINO-BROMIDE PLATES.*

(ABSTRACT.)

ALTHOUGH many dyes have been examined since H. W. Vogel's discovery in 1873, very few of them exert any marked effect in making gelatino-bromide plates sensitive to the less refrangible rays of the spectrum. Only cyanine and the dyes of the eosine group (including the rhodamines), with perhaps malachite-green, alizarine-blue, and chrysoidine, exert any practically useful effect.

The main points established by previous observers may be summarised as follows :—(1) all the dyes that act as sensitisers are readily affected by light when in contact with paper, fabrics, &c.; (2) in order that a dye may act as a sensitiser, it must have the power of entering into intimate union with silver bromide, forming a kind of lake; and (3) it must show a strong absorption band for the particular rays for which it is to sensitise. It is important to observe that the converse of these statements is not necessarily true, since several dyes that have all these properties show no appreciable sensitising action.

Experiments by Dr. E. Vogel on the rate of fading and the sensitising action of the eosine dyes led him to the conclusion that the order of sensitising effect coincides with the order of fading when the dyes are exposed to light. The order in which he places the dyes does not, however, correspond with the order of fading as observed in dyed fabrics, and the experimental method that he used is open to criticism.

The author's observations on the fading of the various sensitisers when exposed to light in contact with gelatine alone led him to the conclusion that, although all the sensitisers are readily affected by light, the order of sensitising effect does not necessarily correspond with the order of fading, whether the dyes belong to the same chemical group or not.

There are two chief hypotheses as to the mode in which the dyes act, namely (1), the view held by Abney, that the dye itself is oxidised by the action of light, the oxidation product remaining in contact with the silver bromide; and, when the plate is treated with the developer, the latter and the oxidation product, acting smiultaneously on the silver bromide, bring about its reduction; and (2), the view first definitely formulated by Eder and endorsed by Vogel, namely, that the energy absorbed by the dyed silver bromide is partially used up in bringing about the chemical decomposition of the silver bromide, instead of being almost entirely converted into heat as when absorbed by the dye alone.

The author has found that the less refrangible rays will produce a photographic image on the sensitised gelatino-bromide plates when they are immersed in powerful reducing solutions, such as a mixture of sodium sulphite and pyrogallol. This holds good for cyanine, the eosine dyes, the rhodamines, and quinoline-red, whether the sensitiser has been added to the emulsion or has been applied to the plate in the form of a bath. It is therefore impossible to attribute the sensitising effect to any intermediate oxidation of the dye.

Experiments with various reagents, such as potassium bromide, potassium dichromate, mercuric chloride, and dilute hydrogen peroxide, seem to show that the chemical nature of the latent image produced by the less refrangible rays on the specially sensitised plates, is precisely the same as that of the latent image produced by the more refrangible rays in the ordinary way.

Further proof in the same direction is afforded by the fact that the effect of the sensitisers extends to the production of a visible effect by the prolonged action of light.

The balance of evidence is therefore greatly in favour of the view that the dye absorbs the particular groups of rays, and, in some way which is not at all clear, hands on the energy to the silver bromide with which it is intimately associated, and which is thereby decomposed.

C. H. BOTHAMLEY, F.I.C., F.C.S.

* Read before the British Association (Section B), Ipswich Meeting, 1895.

THE PRINTING OF HALF-TONE BLOCKS.

[Process Work.]

IT hardly comes within our province to teach the typographic printer how to print a half-tone, nor should we presume to do so, for the British printer is very apt to suggest, in return to any outsider who tendered such advice, that somebody might teach a certain ancient relative to extract nutriment from eggs. Let it be rather understood as our desire to assist the photo-engraver, who has not had much experience of block proving, with a few hints derived from our own practice and the experience of others which has come to our knowledge. At the same time we hope the intelligent printer may profit by our hints. It goes without saying that to send in a good proof to the customer is everything, and whilst we strongly discountenance the practice of "proof-faking," which has brought so much discredit on the half-tone process generally, we think it will always pay to send to the customer two really good proofs with each block. A good proof is always certain to please and impress the customer, and in most cases the second proof goes to the printer, who thus has before him the standard he is expected to attain. Of course, we know that if, for any reason, the printing of the job does not come up to this standard, the printer will blame the block, and say that the proof is not a fair pull; but, if the block-maker is conscientiously certain that the block is good, and honestly proved, he can easily invite the customer to come and see for himself another proof pulled from it. This will convince the customer that it is the printer's appliances that are at fault. We will not say it is his want of skill, for we venture to express the opinion that no greater skill is required in printing a good half-tone cut than in working off a forme of type. It is simply a matter of selecting the proper materials and following a definite method which is applicable to every half-tone cut (always providing the said cut is made as all half-tones should be made—*i.e.*, fit to print). We do not forget that too often the printer is "rushed," has to do the work too cheaply, and use poor ink and unsuitable paper. Even so, we do not exonerate him from blame, for it should surely be his duty to inform the customer that good results are impossible in such case. We very much question whether it would not be better for his own reputation's sake to let the job alone than take it under such conditions. However, these are matters outside the province of the process worker. We turn to the consideration of the process block in its bearings as a printing surface. A common fallacy is that half-tone blocks need overlays, underlays, and other dodges of the printer, and we too often hear of the process worker telling the customer that "this is only a flat pull on the hand press; it will come up ever so much better on the machine when it is made ready." This is absurd, for, with regard to the majority of proofs furnished by the photo-engraver, it can be said that the blocks will never render any better result under any conditions. The process worker who knows his business gets the best possible value in the proof. The half-tone block is, above all things, a flat surface requiring a flat impression. The tones are obtained by varying sizes of the dots, which consequently print larger or smaller patches of opaque ink. Ideally, therefore, the block should yield up all its tones on the white paper by a hard, flat impression, if it is properly inked and the paper smooth. For instance, if a half-tone plate is surface-inked with a hard glazed roller and a full-bodied black ink, a piece of fine surfaced paper placed in contact, and a thin plate of polished steel placed on top, the whole may be run though the press, and the result, if the pressure is sufficient and uniform, will be an ideal impression of the half-tone, every dot black and sharp, and not a shadow filled up or grey.

Now let us take the opposite case. The block is rolled with a thin and insufficiently black ink, with a soft composition roller, a sheet of ordinary printing paper placed on it, and on top a piece of blanket, or several thicknesses of paper, and a strong impression taken, the result will be in no way comparable to the other. The soft roller has carried the thin ink down the sides of the dots and filled up the small cup-like white dots in the shadows, then the soft packing has caused the impression to sink deep into the paper, so that the sides of the dots and the hollows render up the surplus ink. The proof looks heavy and muddy, and, if examined under a powerful glass, it will be seen that around the edge of every dot is a thicker ring of ink, blacker than the centre of the dot, whilst what should be white dots have a thin film of ink over them. The worse the surface of the paper is, and the more prominent the grain on the other side, the greater impression the printer must apply to force the ink into it, and avoid "mealiness." Perhaps the high-light dots of the half-tone take the paper all right, but the shadows are grey. Then the printer probably resorts to overlays, which result in more impression, and a still softer impression, being applied to those parts. Then we get "sooty" shadows, which entirely alter the gradation of the tones. Underlays are equally inadvisable, as they distort the surface of the block; but, as the printer only resorts to these as a rule to correct inequalities of the mounting, the remedy in this respect lies with the photo-engraver. Whilst on this point, we may mention that the latter does not always take the trouble to clean off the back of the plate uneven patches of the backing varnish, which act practically in the same way as an underlay. The best mounts for process plates would undoubtedly be solid blocks of type metal, accurately planed on back and surface. The firm who would introduce these would earn the gratitude of printers. It could be pointed out to the customer that, although the mounting cost more, the difference could be about realised by selling the mounts as stereo metal after use, or the process house sending out these mounts could arrange to credit the metal when sent back, as is done in the stereotypoing trade. Well, it all comes to this, if good results are wanted from half-tones, they must be etched to a depth equal to the space between dot and dot in the high lights; they must be mounted flat; they must be well inked with a rich black ink as stiff as can be worked, and

applied with a hard roller; the paper must be hard and glossy, with a back as smooth nearly as the front; the impression must be flat and even, and as hard as it possibly can be. When the process man inks the block by hand, he rolls the plate as often as need be, but in the printing machine the average printer will rely on its being properly inked by passing rapidly under a couple of inking rollers. Such a rolling is insufficient and has to be compensated for by thinner ink or more ink. The Americans, who lead the world in half-tone printing, have long ago found that a spare supply of ink and plenty of rollers, together with a hard impression, is more than half the battle in printing half-tone cuts. Even poor paper and only moderately good ink will yield fair results under these conditions, as witness the excellent results attained with half-tones in the newspaper press.

PHOSPHORESCENCE OF GELATINE PLATES.

If a gelatino-chloride or bromide plate is developed by the ordinary pyro-soda developer, and after being slightly washed is placed in a two per cent. solution of citric acid, it gives a bright phosphorescent light. The same effect is produced if a plate that has been developed, fixed, and dried, is soaked in the pyro-soda developer before being dipped into the citric acid.

This result does not depend on the presence of the silver of the image, as plates only coated with gelatine show the same phenomenon; the light is not produced if, instead of using pyro-soda solution, only the alkali is used, or only the pyro with or without sodium sulphite.

The phosphorescence is best shown by placing the plate in a ten per cent. soda solution, and allowing it to soak for about ten minutes, then adding a little pyro solution which has been allowed to go brown; on the other hand, it does not appear if the pyro solution is completely oxidised.

If freshly a prepared colourless solution of pyro soda is used, and the plates allowed to remain in only a short time, the light emitted is very weak, it is much stronger if the citric acid bath has been used a few times.

The author suggests that this remarkable phenomenon may perhaps explain the mysterious cases of fog which occur with gelatine plates.

R. Neuhauss, *Phot. Chemik.*

NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS.

At a meeting of the Council of the Association, which all members were invited to attend, held at Anderton's Hotel, Fleet-street, E.C., on Saturday afternoon, November 9 (the President, Mr. W. Barry, of Hull, occupied the chair), the Secretary announced that there was a balance in hand of 10*l.*, after defraying all expenses up to date, including those of the present meeting and his own salary up to February next. The total number of members was 118, and of these ninety-five had paid their subscriptions.

Mr. J. Hubert (Hackney) said that it had been announced that the Photographers' Benevolent Association was about to be wound up. He thought that under better management it might be made successful, and considered that the National Association of Professional Photographers was the right body to take the matter in hand.

Mr. T. Fall (London) thought it useless to attempt to resuscitate the Photographers' Benevolent Association. No pains had been spared by those who had managed it during the past few years to make it a success, but it had been found impossible to obtain that support from the profession which ought to have been given it. He thought it waste of time to discuss the matter. The class whom it had been principally instituted to assist—the assistants—were unwilling to assist themselves, and only came near the Benevolent Association when their needs compelled them to apply for relief. The funds had been provided by dealers, by amateurs, and by many who had no special interest in photographers, but who were willing to give from pure benevolence of heart.

In reference to the "free-portrait frauds," the Secretary showed a placard which had been sent round to members for display on their premises, calling the attention of the public to the way the fraud was worked. Several members said they could not see their way to exhibiting the notice. Mr. Fall thought the only thing that could be done was to assist the local police in securing convictions.

Mr. T. Bromwich (Bridgnorth) asked if any of the members had heard of a similar free-portrait scheme which was being worked from Paris? He also said that their member, Mr. Draycott, of Walsall, who was a member of the Printsellers' Association, thought there was a rule of that Association which might be advantageously incorporated with their own rules.

Mr. T. Birtles (Warrington) thought the rule referred to inapplicable, as it simply referred to the prices at which members of the Printsellers' Association should sell their prints.

Mr. Bromwich thought Mr. Draycott's idea was that the rule might be applied to dealers. Mr. Draycott would be very glad if members of the Association would meet him at his own house to discuss the question, and would be pleased to entertain them.

The Chairman, alluding to the death of Mr. R. Slingsby, of Lincoln, said that the profession had lost one of its most renowned members. In Mr. Slingsby they had not only a worker, but a leader. He moved that an expression of their condolence be communicated to the family.

Mr. R. Keene (Burton), as one of Mr. Slingsby's old journeymen, wished to be allowed to second the resolution, which was carried unanimously.

Mr. J. Hubert said he had just been informed of the death of another whose loss would be keenly felt in the photographic world. Mr. J. Traill Taylor, who had been on a visit to America, had died there.

There was a general expression of surprise and regret at the news.

The Secretary having referred to the kindness the Association had met with from the Duke of Devonshire, while holding the summer excursion, it was unanimously resolved that a letter be written to the Duke conveying their thanks.

Mr. Fall said he did not expect any sympathy with what he was about to say, but he could not help thinking that the Association would gain by holding their summer excursion with the meeting of the Photographic Convention; there they would meet with many professional photographers who were regular attendants at the Convention meetings, and would be able to explain to them the aims and views of their own association. There was no necessity that the Association should lose its individuality in any way, and it might hold meetings for its own business. After some discussion as to the membership of the Convention and other matters bearing on the proposal, Mr. Fall moved, and Mr. Bromwich seconded: That the summer meeting of the National Association of Professional Photographers be held at the same time and place as the Photographic Convention. This was carried.

Mr. Birtles spoke of the inconvenience of holding a meeting in London on Lord Mayor's Day, when the traffic was disorganised and there was considerable difficulty in getting about. He would propose that in future the annual meeting be held on the date fixed for the opening of the Royal Photographic Society's Exhibition. The resolution was seconded by Mr. M. Boak (Driffield) and carried. Messrs. J. Davis, of Lancaster, and F. G. Simpson, of Grantham, were proposed for membership and unanimously elected.

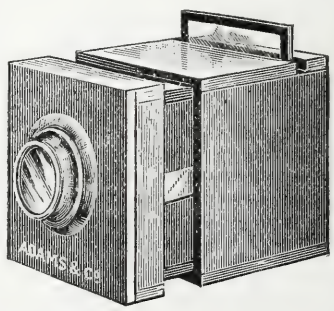
Mr. Lafosse (Manchester) then gave a demonstration of the development of platinotype prints. It was pointed out that it was desirable to obtain platinotypes with sepia or warm tones without having to resort to a second or toning process in addition to the development. The demonstration was for the purpose of showing how this end might be attained by the addition of a compound to the ordinary solution of potassium oxalate used for development, the warmth of the tone being dependent on the quantity of the compound added to the developing bath. Several prints were developed by Mr. Lafosse, jun., which showed the simplicity of the process, and there were also many examples of finished and mounted prints which bore testimony to the beauty of the results produced. It was announced that the compounds would shortly be on the market.

The formal proceedings having been closed, dinner was served in the adjoining room.

Our Editorial Table.

Adams's Popular Pantascope.

This is a handy little instrument for viewing lantern slides, issued by Messrs. Adams & Co., of Charing Cross-road, W.C. The slide is



placed in the slot, as shown, and is viewed through the eyepiece, against ground glass. Excellent and almost stereoscopic-like effects are obtained by examining slides in this way. The Pantascope sells at 5*s.*, and it will be found a companionable addition to one's photographic instruments.

Mr. T. T. Wing, lantern-slide maker and colourist, of Chatteris, Cambs., has sent us catalogue, which particularises many series of

Barnet Plates.

ORDINARY,
EXTRA RAPID,
STUDIO, AND
PHOTO-MECHANICAL
ARE NOW SOLD AT
ONE PRICE.
WE HAVE ALREADY
HAD HUNDREDS OF
APPLICATIONS FOR
THE EXTRA RAPID
IN ITS NEW FORM.

THE VERDICT IS

FOR PHOTOGRAPHING BABIES

USE NO OTHER.

ELLIOTT & SON, Barnet, HERTS.



EASTMAN'S TRANSPARENT FILM

NEW FORMULA.

The Most Sensitive. **Beautiful Gradation of Image.**

The Most Reliable. **Develops Easily.**

Developed just like a Dry Plate.

The Eastman Transparent Film made this summer is the finest ever offered. It is a pleasure to read the letters about it that come from the users.

R. P. GRACE, Esq., writes: "In the last 500 exposures I have not had a defective film; none of the negatives have been touched."

E. R. KENNEDY, Esq., writes: "I cannot repress an expression of satisfaction: this was the eighth spool I have used since the 1st of May; and of 300 exposures there is not one unsatisfactory."

J. W. HARRISON, Esq., writes: "I am pleased to say that the last film I had from you has given me the greatest satisfaction. It has produced most excellent results and uniform work."

A. HOMER HAWKINS, Esq., writing about last season film, says: "I have just developed 30 photographs from the spool you sent me last summer, and am very well satisfied with the results. I was afraid they would not turn out well, as they were in the Kodak some six months after the period for which you guaranteed them."

EASTMAN **Photographic Materials Co. Ltd.,**
115=117 Oxford Street, London, W.

PARIS: 4 Place Vendome.

ROCHESTER, N.Y., U.S.A., Eastman Kodak Co.

slides, comic, Biblical, and various. He makes a speciality of preparing slides from life models, or hand drawn designs.

FALLOWFIELD'S *Remembrancer* for October should be specially useful to lanternists, as it includes priced and illustrated particulars of the latest things in lantern apparatus, &c. Flash lamps in great variety are also shown.

MESSRS. MARION & Co., Soho-square, have issued a price-list of the photographic lenses manufactured by Voigtlander & Son, Brunswick, including the Collinear, the Euryscope series, and others.

THE LANTERN AND HOW TO USE IT.

By C. GOODWIN NORTON. London: Hazell, Watson, & Viney.

MR. NORTON is a practised hand at lantern work and in this little book he has brought together a great deal of practical information in regard to his subject. "The object of this work," says Mr. Norton "is to show the construction of the various kinds of lanterns and accessories now in use, and how to obtain the best results from them." Possibly the best thing we can say in praise of Mr. Norton's book is that it quite achieves the object he had in view when writing it.

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting, Tuesday, November 19, at 8 p.m. at 12, Hanover-square. Discussion on Mr. W. K. Burton's paper, read on October 8, *On the Formation of the Dots of the Half-tone Screen Image.*

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, November 20. A limelight jet competition will be held under the direction of Mr. Andrew Pringle, F.R.M.S. Special photometer invented for the occasion by Mr. Hearson. Visitors will be welcomed by the members.

THE PREMIER AND HIS "CABINET."—An amusing incident occurred in connexion with the formation of the Eastbourne House of Commons. The editor of a local paper sent a messenger to ask for a list of the Cabinet formed by Alderman Strange (the Premier). Misunderstanding the request, the lady who answered the door sent, by the messenger boy, the Alderman's cabinet—a photograph by F. A. Bourne.

GOSPEL OAK PHOTOGRAPHIC SOCIETY.—On Tuesday, November 19, at 8.30 a lecture will be given by Mr. E. Galway in the Lecture Hall of the Gospel Oak Congregational Church, Southampton-road, on *A Trip on the River Ouse with Camera*, showing pastoral and river scenery of surpassing beauty, old bridges, historical buildings, ancient churches and castles, &c., illustrated by means of a powerful oxyhydrogen apparatus.

THE Annual Meeting of the Photographic Club was held on November 6, when the following officers for the ensuing year were elected:—*Trustees:* Messrs. Frank Haes and A. Cowan.—*Committee:* Messrs. F. A. Bridge, S. H. Fry, M. L. Troup, H. Wilmer, E. A. Newell, E. W. Foxlee, J. B. B. Wellington, and E. Crofton.—*Curator and Recorder:* Mr. G. W. Tottem.—*Editor of "Transactions":* Mr. Thomas Bedding.—*Librarian:* Mr. Wallis.—*Secretary and Treasurer:* Mr. James A. Sinclair, 26, Charing Cross-road, W.C.

THE next meeting of the Woolwich Photographic Society will be held on Thursday, the 14th inst., when Mr. J. H. Gear will deliver a lecture on *Negative-making.* This is the first of a course of three lectures for technical instruction to be given by the gentleman named to the members and friends of the Society. A cordial invitation to attend is extended to all who may like to attend. The Council feel that an effort should be made to provide instruction evenings for the members, and the present step, although only a small beginning, will be followed up.

IN the Pall Mall Exhibition the mixture of wide margin pictures with those framed close up has produced a piebald, incongruous effect, and both classes of photographs have suffered by the process. Another year the hangers may well profit by the method adopted at the Salon, where the wide margined pictures are well separated from the others. Indeed, it must be admitted that great taste has been shown, not only in this most important matter, but also in grouping pictures in a light key together, so that they can hold their own against the more strongly treated subjects.—*Autotype Notes.*

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The Seventh Annual Exhibition of this Society will be held at the Public Baths, Church-street, Camberwell, during the week ending March 8, 1896. The classes will be as follows:—Open to members only: Class A, Portraiture and Figure Study, including Animals; B, Architecture; C, Landscape (above half-plate); D, Landscape (half-plate and under); E, Enlargements; F, Lantern Slides (sets of six); G, Excursion Pictures; H, Hand-camera Work. Open Classes: Class J, Pictures which have previously received an award; K, Pictures not previously medalled; L, Lantern Slides which have previously received an award; M, Lantern Slides not previously medalled; N, Process Work; O, Stereoscopic Slides (sets of four). Entry forms and other particulars can be obtained of Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.

FORMATION OF A NEW PHOTOGRAPHIC SOCIETY FOR SHEFFIELD.—At a public meeting held at the Central Studio, Chapel-walk, on Wednesday, November 6, it was decided to form a photographic club. Proposed by Mr. Boden, and seconded by Mr. Oldroyd, "That this Society be called the Sheffield City and Suburban Photographic Society." The object of this Club is to further the study and advancement of photography and kindred subjects. Meetings will be held every Wednesday at 8 p.m. Amateurs are invited to join. Dr. P. Primrose, Hon. Secretary, Central Studio, Chapel-walk, Sheffield.

PHOTOGRAPHY OUT WEST.—Mr. W. Dearden writes to the editor of the *Scientific American:* "I was much interested in reading in a late number of your paper Mr. Buckwalter's article on photography in the Rockies. I can quite confirm what he says about the danger of over-exposure. When I began the art here as a novice, the smallest stop in my lens was about *f*-32. With this stop and an exposure made by lifting off cap quickly and as quickly re-replacing it, the negatives obtained, when the landscape or object was in bright sunshine, were almost invariably spoiled by over-exposure. I finally made a smaller stop, and then got good pictures. I find ordinarily that *f*-64 is as large a stop as can be used safely with a cap exposure for a brightly illuminated landscape. With the shutter (S. and P.) working at one-fortieth of a second, *f*-16 to *f*-11 gave fully exposed negatives. I use Cramer's Banner plates, which are very rapid, though not so much so as his Crown brand. I have seen films of another make rated at sensitometer 27, which were under-exposed under the same conditions. Perhaps the ordinary tourist would succeed best by bringing a slower plate than he generally works with. There is not the same latitude in exposure, required at lower levels for different times of the day, needed here. The sun generally rises and sets almost at maximum brightness. I have got over-exposed negatives half an hour after sunrise on a zero morning with *f*-32 and quick cap exposure. I have not found siochromatic plates of any advantage here so far, and yellow screens with ordinary plates are useless, except for clouds, as they intensify the lights, while destroying detail in the shadows. There is one thing has puzzled me. These over-exposures spoken of were helpless ones, not to be saved by any amount of bromide of potash in the developer, nor by dilution of it. But now and then, under just the same (apparent) conditions—bright sunshine, *f*-32 stop, the same exposure and developer—a good negative was obtained. I suppose either the actinic power of the light must have been less, though the eye could not appreciate it, or else the plates varied, which seems unlikely."

RECENT PATENTS

APPLICATIONS FOR PATENTS.

No. 20,788.—"Improved Photographic Print and Negative Washer." R. M. WATERHOUSE.—*Dated November*, 1895.

No. 21,116.—"Improvements in or relating to Printing Frames for Photographic Purposes." J. S. SLATER.—*Dated November*, 1895.

No. 21,132.—"Improvements in Magazine Cameras." J. G. BRIERLEY.—*Dated November*, 1895.

No. 21,227.—"Improvements in Magazine Cameras." A. LUNDELIUS.—*Dated November*, 1895.

No. 21,268.—"Improvements relating to Gas Lamps for Photographic Purposes." R. H. BEST.—*Dated November*, 1895.

PATENTS COMPLETED.

IMPROVEMENTS IN SHUTTERS FOR PHOTOGRAPHIC CAMERAS.

No. 1924, JOHN EDWARD THORNTON and EDGAR PICKARD, Altrincham, near Manchester, Cheshire.—*October* 5, 1895.

THIS invention relates to that class of shutter in which in addition to the ordinary spring blind, there is an auxiliary spring blind—which may be termed a safety blind—for the purpose of covering the aperture of the ordinary blind whilst being set for exposure.

The exposing blind is formed in the ordinary way, with an aperture about in the centre of it, and the safety blind is formed with an opening at the top edge or with the top edge, connected to a winding roller by tapes or cords. Each blind is attached to two separate rollers, a winding roller at one end of the box and a spring roller at the other end.

One setting cord is applied to the two blinds, being attached to the roller of one, and passing round the roller of the other actuates it by friction.

On the end of the winding roller of the ordinary blind is placed a wharve or other similar device, around which the setting cord is passed with one or two turns. One end of the setting cord is secured to the winding roller of the safety blind and wound round upon it for several turns, so that the pulling of the cord causes the roller to rotate to wind up the blind. The cord is then passed with one or two turns round the wharve or end of the winding roller of the exposing blind, so that, when the cord is tightened and drawn off the safety blind roller, it causes the exposing blind roller to rotate at the same time. Thus, by the pulling and drawing forward of the setting cord, the two blinds are caused to wind up upon their respective winding rollers simultaneously. The cord may be attached to the exposing blind winding roller and work the safety blind by friction, that is to say *vice versâ*.

When the exposing blind is set and the cord released, the blind is retained in the ordinary way in position covering the aperture in the shutter case. The release of the cord, however, allows the safety blind to be immediately drawn back by, and rewound upon, the spring roller, the cord being loose slips freely around the end or wharve of the other winding roller without exerting any material friction thereon.

We find it advantageous to pass the setting cord from the winding roller of the safety blind down to the bottom of the box around the spring roller of the safety blind (or around a pin or roller for the purpose), then back to the top of the box and around the winding roller of the exposing blind, instead of direct from one winding roller to the other. The cord then works the spring roller by friction as well as the winding roller, and thereby prevents slipping during winding up the exposing blind, and it allows the cord to wind evenly on the rollers.

Improvements in Photographic Cameras.

No. 22,896. David Henderson Houston, Hunter, Cass County, North Dakota, U.S.A.—*October* 5, 1895.

The object of the invention is to provide a simple and compact apparatus, which can be readily and easily carried, and which can be quickly adapted for instantaneous or time exposures as may be desired.

The invention comprises a case which contains all the operating mechanism of the apparatus, which case may be constructed rectangular in shape, with light-tight joints. This case is constructed with an open front, and on the top of said case is placed a level extending longitudinally of the case, said level having its centre adapted to align with a sight on the top of the case.

To assist in aiming the instrument I provide marginal sights on the frame on either side of the lens tube, by means of which the operator is enabled to see at a glance exactly what amount of field the lens in use on the instrument will cover, as he has previously set the marginal sight to the proper positions in line with the indicating marks on scales on the sight plate so that they will take in the same number of degrees as the angle of his lens when in use will admit, whereby the operator is not required to view the field through the camera every time a picture is taken, and a more serviceable method employed.

A frame is adapted to fit snugly in the case, and the front of said frame projects beyond the edges thereof, and forms a front for the case, and fits flush therewith, to exclude all light from the interior of the apparatus. This front piece is provided with a rabbet joint, and, after being placed in the case, the parts are fastened together by suitable clasp devices or hooks.

The front of the apparatus carries the sight plate, which is fitted on and attached to the upper edge of the front, said sight plate being provided with a central sight, the adjustable side sights and the scales adapted for use in connexion with the side sights to indicate the range of field of the camera. In the centre of this front is a telescopic section, which can be telescoped within the frame or projected therefrom when it is desired to use the apparatus. To accomplish the telescopic movement of the section without allowing the rays of light to enter the apparatus, I construct said section with flanges which lap over the frame, and in the edges of said frame are secured strips of packing. I also provide a light-excluding slide, which can be adjusted in place and used as may be desired. The side is fitted in suitable guides or ways provided on the inside of the telescopic section, and, when it is desired to prevent the rays of light from entering the camera before the apparatus is to be used, or when adjusting any of the parts thereof, this slide can be closed across the section between the lens or light inlet of the camera and the sensitised film at the back rear side thereof. This slide can be adjusted from one side of the section, as ready access can be had thereto when the section is projected beyond or drawn outward from the casing, and in front of the camera, as will be readily understood. By this telescopic construction of the section a considerable amount of valuable space is saved, because the section can be moved into the interior of the frame or case when the apparatus is not in use, and it then presents a compact form, suitable for transportation, which is especially desirable in this class of camera.

When the apparatus is to be used, the section can be produced until the flanges engage with the front of the frame.

In the back of the case or frame is an aperture, and a slide is arranged to operate in grooves to close or open said aperture as desired, the aperture disclosing a ground glass arranged in the frame or case inside of the slide.

Secured to the front of the camera frame and casing on either side of the telescopic section are two light-excluding partitions or divisions, which protect the rows of film hereinafter mentioned from the action of the light passing through the lenses.

The supply spool is secured on a shaft, which is journalled in bearings in the frame, and it has a slot or opening in which one end of the film is secured, and then the film is wound on the spool until it is full.

The shaft on which the spool is secured is fastened in place by means of a cap and pin, which form a bearing for said shaft. The film is wound upon the supply spool, and the free end thereof is passed around a measuring and guide roller secured on a shaft across the front face of the ground glass.

From thence said film passes around another guide roller secured on a shaft, and thence around another spool. The film may be wound on the take up spool, in the reverse direction to the winding of the film on the supply spool, or the film may be wound on the take-up spool in the same manner as the supply spool, so that both of the spools may turn in the same direction, and the heads or handles rotate simultaneously in the same direction, whereby the operation of the rolls and adjustment of the film are greatly facilitated. Secured on the partitions or divisions, and projecting over the spools, are two spring arms, which carry bearing rollers. These bearing rollers are adapted to bear on the film wound on the spools respectively, and serve the purpose of preventing the end of the film from flying loose when the spool is being placed in the spool frame or being taken from said frame. The film can then be wound tightly on the spool, and the compact wrapping preserved, and any tendency of the film to unwind is prevented. The caps or bearing plates for said rolls have corrugated peripheries and a spring back is secured on the frame and provided with projecting arms arranged to bear against the corrugated edges of the caps, said springs having slight bends or projections, which fit in the corrugations and operate to steady the rotation of the spools.

The supply spool is constructed of two pieces secured together in a suitable manner, and the larger piece has a hole square or polygonal in cross section in which the shaft is fitted.

The guide roller is provided with perforators at either end of the same, which project slightly beyond the surface of said roller, and perforate the sensitised film at each rotation. Thus every length of the film, which is measured off in a manner hereinafter described, is perforated and marked by the perforators two, three, or more times, and these perforations indicate to the operator the lines of division of the film to divide the several pictures preparatory to development. The circumference of the measuring roller is such that it will require three revolutions thereof to mark the limits of each picture length, and the operator can thus readily tell where to divide the pictures by counting the perforations.

In the corner of the case where the guide and measuring rollers are located are curved recesses, and said rollers extend into said recesses. The film, which passes around the roller close to the frame, extends across the face of the ground glass and around the other guide roller. After passing around the guide roller in the same direction as it passes around the measuring roller, the film may be crossed to the inside of the take-up spool, and secured thereon, to be wound up as operated.

To enable the operator to manipulate the supply and take up the spools, the shafts on which they are secured extend through the frame, and are provided with ratchet wheels or caps as heretofore described, and the shafts pass only half way through the caps, thus leaving a hole for inserting a key, which is fitted through openings in the case provided for that purpose. As the take-up spool is rotated to present a new surface on the film, the supply spool is also rotated, and the spring arms which bear on the corrugated peripheries of the caps regulate the movement of each spool, and cause them to rotate simultaneously and regularly, the projections (fifteen) fitting in the recesses in the periphery of the caps.

The lens-holding tube is arranged to slide or telescope in the telescopic front section, and this tube is provided with annular flanges on the inner and outer ends respectively. The lens-holding tube fits snugly in the opening provided for it in the section, and the flanges engage with an annular ring or cap having packing which fits around the opening in said section, and thus the lens-holding tube is adapted to slide in and out of the telescopic section and at the same time a light-tight joint is preserved throughout, which is necessary in this class of inventions. These flanges may be properly designated as the caps of the cylinder forming the outside lens-holding tube, as they are screwed to the respective ends of said tube, and the inner flange or cap has an inward projection constituting the support for the interior tube for holding the lenses.

In the rear part of the frame the light-excluding divisions extend almost to the back of the interior side of said frame, and between the back ends of the divisions are two film-edge-holders extending between said divisions, which film-edge-holders hold the edge of the film in proper position as it passes along from one guide roller to the opposite guide roller. The divisions are secured to the front of the case, and they are held firmly in place between the top and bottom of said frame by bolts which clamp the top and bottom together, and the divisions are held rigidly between them.

The telescopic front section of the holder is arranged to slide easily in the opening provided for it in the front, and, when extended, the flange on its rear edge fits flush against the partitions and front, and the packing serves to form an additional precaution against admitting light to the interior of the holder. The lens tube also slides or telescopes into the front section and the interior of the holder and also has packing to exclude the light, and the lens tube is provided with a scale on its outer surface by means of which the operator is able to determine, after a little experimenting, exactly how far to project the lens tube in order to obtain the correct focus, and the scale is read with reference to its position to the cap around the opening in the telescopic front section.

When the operator desires to present a new section or surface of the film in its proper position for an exposure, the take-up spool is turned which causes the film to unwind from the supply spool and pass to its proper position behind the lens, such section or surface of the film occupying the space at the rear of and between the lines of the light-excluding divisions. After passing from the supply spool, the film goes around the measuring and guide roller, and at each rotation thereof the film is marked or perforated by the perforators, every third mark of which perforators designates the exact dividing line between the latent impressions.

A modified construction of the holder consists essentially in securing the lens tube on a movable piece which is arranged to slide vertically in the front of the holder. This construction permits the lens to be moved up or down, and when not in use the lens tube can be moved backward into the interior of the holder as in the preferred construction.

In another modified form, the glass, the slide, and aperture are omitted and the end walls of the holder and the partitions or divisions are made of a light metallic substance which secures greater space with the same size holder.

When it is desired to adjust the camera, the sliding or telescopic front is drawn outward to its full limit, and the lens tube projected or adjusted to the proper focal point by focussing the lens on the ground glass on the inside of the back holder and the operator notes the position of the lens tube by observing the position of the scale in relation to the ring or cap through which the lens tube slides. The lens having once been adjusted to the proper focal point. it will be found to be correct when again placed at the same position on the scale for any view that includes only distant objects and those not nearer the instrument than the depth of focus of the lens used will include in proper focus.

By very little experimenting and noting results by focussing objects at different distances the operator will be able to know just how many degree marks on the scale to allow for any estimated distance between the instrument and the principal field of view, thus obviating the necessity of finding the focus on the view by an adjustment of the image on the ground glass of the instrument every time before a view is made.

An Apparatus for the Production of Stereoscopic Photographs with a Single-lens Camera at One Exposure.

No. 21,406. Theodore Brown, Portland House, Fisherton, Salisbury. *October* 12, 1895.

This invention relates to an apparatus, the function of which is to reflect to

one lens the two views of one object as seen from the optical angle, so that a double photograph which is stereoscopic may be taken on one plate at one exposure.

The means by which I propose to carry out the said objects of my present invention are as follows :—I construct a framework, into the centre of which I fix a mirror in a perpendicular position, having two reflecting surfaces at such an angle as to receive the reflected views from two other mirrors, also in a perpendicular position, which are placed at the optical angle of vision at a short distance from the said centre mirror.

The said mirrors at the optical angle are hinged perpendicularly to the framework in such a manner as to allow them to be adjusted to the different optical angle when looking at a distant or near object.

To effect the object of my present invention, the said mirrors at the optical angle are directed towards the object to be photographed, and the said centre mirror facing towards the lens of the camera, so that both views of the object, as seen from the optical angle, are reflected unto the screen of the camera. The plate is then inserted, and the exposure made in the ordinary way.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
18	Camera Club	
18	Glasgow and West of Scotland	
18	Leeds Photo. Society	
18	North Middlesex	
18	Richmond	*Photographic Impressions and Finger-posts.* Hector Maclean.
18	South London	Competition: Excursion Lantern Slides. —Members' Lantern Slide Testing Night.
19	Birmingham Photo. Society	*Elizabethan Houses: Historic and Legendary.* J. Gale.
19	Brixton and Clapham	
19	Derby	
19	Exeter	
19	Gospel Oak	*River Ouse.* E. Galway.
19	Hackney	
19	Hastings and St. Leonards	
19	Keighley and District	
19	North London	
19	Paisley	
19	Rochester	
19	Royal Photographic Society	Discussion on W. K. Burton's Paper, *On the Formation of the Dots of the Half-tone Screen Image.*
20	Brechin	
20	Bury	
20	Croydon Camera Club	Photographic Chat.
20	Leytonstone	
20	Manchester Camera Club	
20	Photographic Club	
20	Southport	
20	Southsea	
21	Bradford	Exhibition of Members' Slides.
21	Camera Club	
21	Glossop Dale	
21	Greenock	
21	Hull	
21	Leeds Camera Club	*Art in Relation to Photography.* A. Keighley.
21	Leigh	*Negatives and their Defects.* T. L. Syms.
21	Liverpool Amateur	Lantern in Use.
21	London and Provincial	
21	Oldham	
21	Putney	
22	Birkenhead Photo. Asso.	*Toned Bromides.* Mr. Walton.
22	Cardiff	
22	Croydon Microscopical	Night for Receiving Pictures, Photographic Prints, and Transparencies for Exhibition at the *Soirée.*
22	Holborn	
22	Maidstone	
23	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 12,—Ordinary Meeting,—Sir H. Trueman Wood, M.A. (President), in the chair.

The PRESIDENT said he had to make an announcement which would be a cause of much grief and pain—he referred to the death of Mr. J. Traill Taylor. The Council had that evening passed a resolution expressing their regret at the occurrence, and their deep sympathy and condolence with Mr. Taylor's relatives in the bereavement which had befallen them. The President said that nothing he could say could express the feeling which would be present in the hearts of all those to whom Mr. Traill Taylor had been known, and he must have been known personally to almost all, and by name to all, in that room. Those who knew him valued him as a friend, who was always willing to give the benefit of his experience and very wide knowledge in photographic matters to any who consulted him. He had been an indefatigable member of the Society, and one of its most valued officers. It was difficult on such occasions as the present to adequately express one's feelings, but Sir Henry said he was sure that all would endorse the letter of condolence which the Council had directed to be sent to the relatives of the deceased.

The PRESIDENT announced that Messrs. Wilkinson and Bolas had been elected as members of the Council in the place of the late Mr. J. Traill Taylor and Mr. H. A. Lawrance resigned.

Thirty-seven new members were elected, and twelve applications for membership were read. It was also announced that eight members had been admitted to the Fellowship of the Society, and that Mr. James Glaisher, F.R.S. (ex-President), had been admitted as an Honorary Fellow.

Mr. JAMES CADETT then read a paper on *Colour-correct Photography and a new Plate.* The paper commenced with a reference to a paper by Mr. J. W. Gifford, read before the Society on March 29 last, and to the discussion which followed Captain Abney's lecture on *Orthochromatics*, and Mr. Cadett said that with all respect to Mr. Gifford he maintained that colour contrast could not be rendered by photography unless photography were able to reproduce the colours photographed. Colour was only the visual impression corresponding to oscillation-frequency, and had nothing to do with any monochrome process. The object of orthochromatic photography was to bring visual intensity and photographic intensity into harmony, and credit should be given to Professor H. W. Vogel as the father of orthochromatics, he having taken the first step towards the attainment of this object in 1873. Orthochromatic photography—which he understood to mean the production of a plate sensitive to different portions of the spectrum—had, *per se*, nothing whatever to do with colour; it was merely sensitiveness to particular wave-lengths of light, but the fact that we see certain wave-lengths as red, yellow, green, blue, and violet, had nothing to do with the resulting negative. Having compared the eye with the ear, and quoted Professor Roscoe's statement to the effect that we can hear about eleven octaves, but that our colour sensations were within the limit of a single octave, the paper proceeded to detail a number of experiments in photographing spectra with ordinary and orthochromatic plates, some without a screen, and others taken through a light filter of a very weak alkaline solution of chromate of potash, with a view of showing the perfection of result which had been attained, the spectra being practically continuous. Some manufacturers of orthochromatic plates claimed as a good point a deficiency in the red, on the ground that it was impossible to find a safe light for the manipulation of red-sensitive plates, but he failed to see that a plate should be made imperfect for the sake of ease in manipulation. He referred in highly appreciative terms to Captain Abney's method for testing orthochromatic plates, and suggested that it might be applied to the question of dark-room illumination. Inasmuch as the new plate which he was about to place upon the market was equally sensitive to red as to green or yellow, he might be asked how he was going to make and examine such plates. It was a very awkward and difficult matter to make a light comparatively safe, and for this reason his first output of plates would probably be from very slow batches, something more nearly approaching wet collodion than the ordinary dry plates; they would, however, be of immense value in copying works of art, and he hoped subsequently to increase the rapidity. The statement had been made that the spectrum was of no value where mixed colours had to be dealt with. It was a ridiculous statement, based on pure ignorance. He saw a very great future for the three-colour process. With a perfectly orthochromatic plate, negatives for blocks could be prepared of various colours simply by using suitable light filters. He hoped to see the day when every person ordering photographs would receive prints in colour. Even if the developer had to be poured on in total darkness, the result would be worth the trouble, and a moderate amount of light might be used to continue development.

Mr. B. J. EDWARDS said one of the greatest difficulties in the manufacture of isochromatic plates was that plates sensitive in a marked degree to yellow and green were also somewhat sensitive to red, so that they were easily fogged in development even with a ruby light. He thought a plate insensitive to red had a far more extended sphere of usefulness than one sensitive to all the colours of the spectrum. It was easy to make a plate equally sensitive to all colours, but he did not believe that it would be appreciated, or, except for very special work, that would be an advantage. If the effect of the invisible violet rays could be got rid of, an enormous step would have been achieved.

Mr. L. WARNERKE asked Mr. Cadett's opinion as to the proper colour filter to be used with his plate for three-colour work.

Mr. W. E. DEBENHAM said the paper might be regarded as the prolegomena to any system of orthochromatic work; it recognised what the essentials were, and set them forth very clearly. He referred to the many mistaken statements made with respect to photography by unscientific experimenters, and especially to the opinion which had been expressed that a screen increasing exposure twice or three times might be valuable for orthochromatic work with ordinary plates. Red ought to be represented with proper luminosity, and any difficulty caused by red sensitiveness must be met and overcome. With regard to dark-room illumination, he had some years ago suggested the use of two small lanterns, one screened with red and the other with a yellowish green, the light from both being directed on to a curved yellow screen which formed the source of illumination.

Mr. SEBASTIAN DAVIS suggested that development should be commenced in absolute darkness, and light admitted gradually as the image appeared.

Mr. E. J. WALL asked what Fraunhofer line Mr. Cadett had photographed in the ultra violet, and whether the chromate of potash screen was used to cut out the ultra violet, and up to what line. He dissented from the statement that a plate correct for all colours would be a great thing for three-colour such a plate was the greatest nuisance in that process.

After remarks by Mr. FUERST and Mr. ENGLAND,

Mr. CHAPMAN JONES said he was rather disappointed with the paper, because it contained so little about the new plate, and so much that most of them knew before. A plate could be developed by white light if there were little enough of it, and it was equally easy to develop a red-sensitive plate by work, for red light.

Mr. T. R. DALLMEYER understood that Mr. Cadett claimed to have been successful in producing a plate which would yield a result entirely corresponding to the visual impressions. He asked Mr. Cadett's views as to the best correction of a lens for use with the new plate.

The PRESIDENT, in moving a vote of thanks to Mr. Cadett, said he thought he had been a little hard on colour; colour, after all, was a popular name for

wave-length, and, if a plate represented the effect of different wave lengths, it indirectly represented the effect of colour.

Mr. CADETT, in reply, said his standpoint was this, that, if a plate was to be correct throughout the spectrum for visual luminosities, they had no right to limit their perfection to any particular colours, eliminating others. The question of screens for three-colour work would have to stand over until he had made further investigations, in which he did not anticipate difficulty. He quite recognised that there were difficulties in the manufacture of red-sensitive plates, but they must be put up with if perfection was to be reached. He had successfully developed his own plates in the presence of a very weak yellow light, being careful that very little light fell on the plate. He thought the plate was less sensitive after the developer had been poured over it, the developer having a precipitating action on the dye. He had not had time to ascertain the particular lines to which Mr. Wall referred, but would do so. He thought plates sensitive to all colours were a decided advantage in three-colour work, and differed from Mr. Wall on this point. Mr. Dallmeyer was far better able than himself to deal with questions affecting lenses, and perhaps would some day produce a lens exactly suited for orthochromatic work.

A vote of thanks was passed to Mr. Cadett for his paper, and the Hon. Secretary (Mr. CHAPMAN JONES) then read a note by Professor W. K. Burton, C.E., on the *Sensitiveness of Picrated Gelatine to Light*. Professor Burton had used plates coated with picrated gelatine as colour screens in orthochromatic work, the results being highly satisfactory, also for various purposes in printing, and as a useful medium in dark-room lanterns. He had found that the plates darkened on lengthened exposure to sunlight, and that it was possible to make prints from negatives, the unchanged portion being washed out and the image appearing in relief. He did not expect any wonderful results from the use of a substance requiring so long an exposure, the only practical result of the discovery so far as he had gone being the production of an excellent medium for the illuminstion of dark rooms. A picrated screen might be made by fixing an unexposed gelatino-bromide plate, washing it, and staining by laying it for a few minutes in a solution of picrate of potassium; it was desirable to varnish the film, as the surface was thereby improved.

Mr. JOHN SPILLER remarked that Professor Barton's statements were confirmed by the fact that light had a certain action on wool and other substances which had been dyed with picric acid.

A vote of thanks was accorded to Professor Burton, and the meeting, which was very largely attended, then terminated.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 7,—Mr. H. C. Rapson in the chair.

Mr. A. J. Banks was proposed for membership.

The HON. SECRETARY reported on his trials of the "Venus" paper, distributed a fortnight ago.

Mr. BAYSTON passed round two whole-plate negatives, taken with a Goerz lens of five-inch focus and a rectilinear of five-and-a-half inch focus, calling attention to the definition and covering power of the lenses shown in the same. He also showed the result of a preliminary experiment in connexion with the Watkins competition.

Mr. T. E. Freshwater brought forward a new application of photo-micrography in the shape of a penknife fitted with a microscopic calendar and lens.

Mr. J. E. HODD stated that he used to keep chloride papers in a calcium tube, the calcium in which had got damp. Through the tube falling, some particles of the calcium reached the paper. which, on being printed, was found to be covered with insensitive spots. He passed round a print showing the result.

Mr. W. E. DEBENHAM said the reason was obvious. Silver chloride papers, in order to print expeditiously, required the presence of free nitrate, which had been acted upon by the calcium particles and converted into chloride, which was much less sensitive to light, and remained white in the print.

A long and animated discussion on the definition of a good photograph and an artistic production took place between Messrs. Debenham, Welford, Teape, and the Hon. Secretary, the only result of which seemed to be the strengthening of the speakers' individual opinions.

The HON. SECRETARY, referring to a previous discussion in connexion with development and the rendering of gradation, said Mr. Debenham had given certain instances in which the gradation was materially altered, the widest departure being in negatives developed with soda. This was against the Hurter & Driffield theory. He (the Secretary) had said that the plate must be developed as far as it would go, to which Mr. Debenham had replied that that was not the case. The Hon. Secretary asked whether it was fair to take one portion of a man's statement without the other, and, because No. 2 was a limitation of the first, to take the first. He maintained that the whole of the statements should be taken in order to arrive at their full meaning.

Mr. DEBENHAM considered the second was not intended to limit the first, and was quite separate. He appealed to Mr. HADDON, who, however, thought that both ought to be taken together. Mr. Debenham said that Mr. Watkins did not put that limitation on it.

Mr. J. E. HODD asked as to the suitability of the incandescent gaslight as applied to the enlarging lantern, and whether it was so superior, as recently made out, to other illumination.

Mr. A. HADDON said that naturally the size of the illuminant influenced the definition, and, the size of the mantle being large, the definition must be impaired. The mantle itself was opaque, and therefore the light from the back portion of the mantle could not traverse the front portion, and consequently the full benefit of the light was not reaped, as in the case of an ordinary flame, which was transparent. The whole of the light given by the mantle could not be used, but it was more actinic than where oil was used.

The HON. SECRETARY suggested the use of a stop necessitating longer exposure to obtain finer definition by decreasing the size of the illuminant.

Mr. T. E. FRESHWATER said one did not get anything like the light as one would with a four-wick lamp. The incandescent gave a bluer light than did oil, but it had not the volume or quantity. He thought, however, that it would answer better for enlarging than an oil lamp.

Mr. A. HADDON, referring to the assertions frequently heard that pyro was a powerful tanner, distinctly denied its tanning action.

Mr. HODD drew attention to a statement in *Scraps* that sulphite in pyro solution greatly destroyed its developing power.

Mr. W. D. WELFORD always mixed the sulphite at the time of use, and thought nothing equal to dry pyro. He mentioned that discoloured pyro may still have all its developing power, while clear pyro often was very weak. He preferred metabisulphite to ordinary sulphite.

Ealing Photographic Society.—The first Lantern Exhibition of the season was held at the Prince's Hall, Public Buildings, on Thursday last. The President (Mr. H. W. Peal), presided over a full attendance of members and friends. One new member was elected, and there were two nominations for membership. The *pièce de résistance* of the entertainment was a fine set of seventy slides, illustrating Ealing and neighbourhood, produced by the late Mr. Charles Whiting, and by him presented to the Society. The churches, the streets, the greens, and the lanes of the district, and the river Brent had been laid under contribution to furnish a series of pictures which displayed a happy combination of technical skill and artistic feeling. Amongst the more striking may be mentioned: *Interior of the Old Church; The Mall; The Broadway; St. Mary's-road; The Public Buildings; Perivale at Time of Flood; Interior of Perivale Church; Cattle by the Brent; Willows and Flags on the Brent; Sunset on the Millpond, Hanwell; Hanwell Church and Brent; The Lake, Gunnersbury Park.* Other interesting slides were: *Ealing Fair; Card of Ealing Races*, 1819; *Notice of Sports at Ealing Fair*, 1819; *The Old Hat; Gipsy Encampment at Perivale;* and flashlight views of the Society's meeting room and dark room, with members "at work." The President furnished some highly successful specimens of instantaneous work at Sea View Regatta and on the tennis ground. The Hon. Secretary (Mr. R. J. Murphy) contributed a number of "old friends," ranging from the west coast of Ireland to the Pyrenees; Mr. G. Peal exhibited scenes in Germany; Mr. Dawson, animal studies at the Zoo, and various views; and Mr. Fryer more Ealing views, including *The Lych Gate, St. Mary's.* Mr. A. E. Smith handed up a few choice slides, depicting *The Woods, Woking; Drayton Green Farm; Burnham Beeches*, &c. Mr. T. Crisp provided several exquisite flower studies: *Woodpecker and Nestlings, Surrey Common, Windsor Castle*, &c. The lantern was manipulated by Mr. T. Simpson, jun., and Mr. G. Peal.

Richmond Camera Club.—November 4, Mr. Purcell in the chair.—Mr. GIBSON gave a demonstration on *Lantern-slide Making.* Mr. Gibson referred to the various advantages peculiar to each of the two rival methods—reduction and contact—remarking that he did not agree with the popular idea that better definition is obtainable by the former process. The power of modifying the colours of the resulting slide by means of alteration in the exposure and constituents of the developer was also mentioned, and a number of slides, varying from black to red, were passed round to illustrate this. Mr. Gibson then exposed some Alpha plates, and satisfactorily developed them by ordinary gaslight, after which he exposed and developed some Paget plates, this time by the aid of an ingenious lamp of his own construction, consisting of an ordinary hock bottle, with the bottom knocked out, placed over an oil lamp with chimney. This gave a safe and brilliant light.

South London Photographic Society.—On November 4, at the usual meeting of the above Society, Mr. DOCKREE, of the Brixton and Clapham Photographic Society gave a very interesting series of slides illustrating a holiday with the camera. Commencing with views of Salisbury Cathedral, we next visit Old Sarum on our way to Stonehenge. The pictures in and around these places were much admired. Mr. Dockree, proceeding with his discourse, brought before us excellent views of Wimborne Minster, Winchester Cathedral, and Hospital of St. Cross, and finishing what must have been a most enjoyable holiday with scenes of Netley Abbey and Chichester Cathedral. We must congratulate Mr. Dockree upon such a number of good slides, and thanks are also due to Mr. French (the Lanternist) for his manipulation of the lantern during a long evening. The usual vote of thanks to the lecturer closed the proceedings.

Woodford Photographic Society.—November 7, Mr. E. Marriage in the chair.—A vote of thanks was passed to the late President, Mr. E. B. Caird, for his services during the past year. Mr. Marriage submitted three slides made from stale plates. They showed considerable lack of density, and were wanting in all the characteristics of a good slide. Some were also shown that had been reduced by Howard Farmer's reducer, and another showing the effect of metol upon an intensified slide. Arrangements were then made for the exhibition of members' work on Saturday, December 7, and the programme for meetings up to the end of February settled. On November 21, a discussion will be opened by Mr. H. W. Bennett on the representation of movement by photography.

Leeds Camera Club.—Dr. THRESH's second lecture on *The Chemistry of Photography* was delivered at the Club's room, Bond-street, on Thursday evening last, before an appreciative audience of members. This series of lectures has now reached a very interesting and edifying stage, and the knowledge gleaned from the lecturer's valuable hints and instruction will, doubtless, bear early fruit, and be evinced at an early date by the members, who will be able to produce more satisfactory results with greater certainty than heretofore, through a more intimate acquaintance with the manufacture and after-treatment of the dry plates from a chemical and theoretical standpoint. Dealing first with the manufacture of photographic emulsions, the lecturer explained that some organic matter must be employed to hold the sensitive salts of silver in suspension, and with which the glass plate or other support is coated. For this purpose almost any vegetable matter can be used as the menstruum, stale beer, coffee, and similar semi-fluids having frequently been brought into requisition; but gelatine has now been universally adopted

by makers of dry plates. Dr. Thresh then gave a recipe for emulsion-making, and explicitly explained the part played by each ingredient. For ordinary dry plates he had found the following formula work excellently well :—No. 1. Silver nitrate, 170 grains ; water, 30 drachms. No. 2. Chloride of sodium, 30 grains ; potassium bromide, 60 grains ; gelatine (soft), 70 grains ; water, 30 drachms. No. 3. Nelson's gelatine, 124 grains ; Heinrich's gelatine, 124 grains ; water, 1 ounce. First warm No. 2 to about 100° Fahr., and mix with No. 1 in the dark room, shaking the mixture well for about fifteen minutes. Then heat to 120° Fahr. Allow it to cool to 70° Fahr., and add No. 3. It is now cooked in a water bath at 120° Fahr. for about thirty minutes, the opalescent blue tinge of a small quantity spread upon glass being a sufficient indication that, for slow or ordinary rapid plates, cooking has proceeded far enough ; but, if greater rapidity is required, either a small quantity of ammonia must be added (which the lecturer did not advise) or the cooking process must be prolonged. The salts of silver are now held in suspension in the viscous matter, but must be thoroughly washed to remove the free nitrate of potash produced by the chemical action that has taken place. This is effected by first allowing the emulsion to set, then squeezing it into shreds through gauze or coarse linen, and washing in running water for some time. The water is then drained off through a wash-leather filter, the emulsion is remelted, the glass plates or celluloid film coated therewith, and allowed to set and dry, all these operations, of course, being conducted in the dark room. For lantern plates the lecturer recommended the addition of two or three grains of citric acid to the foregoing formula ; whilst, for bromide paper, one ounce of glycerine should be added to give the necessary pliability to the film. On exposure to light, the following chemical changes take place in the emulsion :—The bromide of silver becomes sub-bromide of silver, and bromide gas is liberated ; or, $2AgBr + light = Ag^2Br + Br$. Whether this action be due to the vibratory wave motions of light or to electrolysis, scientists and chemists still consider it a debatable point, but Dr. Thresh strongly favours the latter theory, in proof of which he showed that an image could be formed without the action of light and with the aid of electricity alone. The nature of orthochromatic or isochomatic plates was next explained, the lecturer pointing out that correct colour values were secured by staining the film of emulsion upon the plate with various aniline dyes, thereby increasing the actinic action of the practically inert portion of the spectrum. Finally, the chemistry of development was fully treated upon, the lecturer explaining the varying action of acid and alkaline developers, asserting that the action of the developing salt was to remove the oxygen from the water in which it is in solution, and thus liberating the hydrogen, which at once attacks the bromine and produces the photographic image. As an example of this action, he mentioned that pyrogallic acid has a great affinity for oxygen, and it is on account of this alone that it can be employed as a developing agent. In further proof of this statement, he claimed that development could be effected by the decomposition of water by electricity, and without the presence of any chemical agent whatever. Consequently, we seem but a short step from the time when our photographs will be taken by electricity, developed and finished by the same mysterious force, and chemicals, in photography, become a thing of the past.

Liverpool Amateur Photographic Association.—November 7.—Mr. GEORGE E. THOMPSON delivered his second lecture on Corsica before the members and friends of the Liverpool Amateur Photographic Association, entitled *A Drive round Southern Corsica*. The previous lecture included the historical and social aspects of the Corsicans and their country. This having been disposed of, the more room was left for the various incidents of travel and adventure so plentifully strewed in the path of Mr. Thompson and his friend, as they proceeded on their fortnight's tour by carriage-and-pair round the southern part of the island. The description was given with very interesting and vivid touches, and the fine series of photographs by which the lecture was illustrated included many gems of the photographer's art.

Rotherham Photographic Society.—Ordinary Monthly Meeting, November 5, Dr. F. B. Judge Baldwin (President) in the chair. Good attendance. It was announced that satisfactory arrangements had been made with the Corporation for the use of a room in the public hall, increased accommodation having become necessary owing to the growth of membership. Three new members were elected, bringing the total up to sixty-seven. Samples of "Well-in-tone" P.O.P. and bromide papers, also of helios-celloidin and palladium papers, were distributed. A comprehensive programme for the coming session was submitted by the Council. Lantern slides by Mr. Lyth (Treasurer) and Mr. P. G. Turner were shown, after which the admirable collection of slides lent by the Cheltenham Amateur Photographic Society were put through the lantern.

Sheffield Photographic Society.—November 5, the President (Mr. Nowill) occupied the chair.—Eight new members elected, after which some prize lantern slides were thrown on the screen, some of the seascapes being greatly admired. The lantern was manipulated in a most efficient manner by Mr. J. W. Charlesworth, who was accorded a hearty vote of thanks.

Southport Social Photographic Club.—The Fifth Annual Exhibition was held at Mr. Cross's Studio Rooms, 15, Cambridge Arcade, from October 28 to November 2, and was by far the most successful the Club has yet had, both from the number of exhibits and the quality of the work shown. This was the first year the Club had decided to throw some of the classes open to all parts of the kingdom, and with a very satisfactory result, some excellent exhibits being received. The arrangements were made by a Committee consisting of Messrs. D. E. Benson (President), H. J. Heaton, C. T. Depree, J. R. Cave, and G. Cross (Secretary) ; and the Judges were Messrs. Julius A. Kay Lloyd, W. P. Christian (of Southport), and Mr. W. J. Chadwick (of Manchester), who awarded eleven silver medals, eleven bronze medals, and ten certificates, out of a total of 131 exhibits. The various processes were well represented. Collodio-chloride, platinotype, and P.O.P. were mostly employed. The medalled flashlight effects were exhibited by Mr. F. Marsh, of Henley-on-Thames, and the lantern slides of flower studies, by Mr. Fraser, of New York, were of exceptional excellence, and a leading feature of the Exhibition. The exhibits and awards were as follows :—Class 1 (members only).—Landscape and Seascape, set of four :—1. *Views in the Valley of the Dane and Churnet* (Ilford P.O.P.), Mr. C. F. Depree ; 2. Various (C.C. gold-toned platina matt, cold bath, Dr. Hawksley ; 3. Various (C.C. gold-toned platina matt, cold bath), Dr. Hawksley, silver medal, presented by Rev. C. H. Hatfield, M.A. ; 4. Various (Paget collodio-chloride), Mr. H. J. Heaton, bronze medal ; 5, Various (Paget collodio-chloride), Miss Dunmore ; 6. Various (Ilford P.O.P.), Mr. R. J. Parkes ; 7. Various (Ilford P.O.P.), Dr. Sargen Tordoff ; 8. Various (Ilford P.O.P.), Miss Wall ; 9. Various (Ilford P.O.P.), Mr. W. P. Brown ; 10. Various (Ilford P.O.P.), Mr. W. P. Brown. Class 2 (members only)—Architecture, set of four :—11. *Views in Normandy*, Mr. H. J. Heaton, bronze medal. Class 3 (members only)—Figure Studies, set of four :—12. Various (Paget C.C.), Miss Dunmore ; 13. Various (Paget C.C.), Miss Wall ; 14. Various (Paget C.C.), Miss Wall ; 15. Various (Ilford P.O.P.), Mr. R. J. Parkes, certificate ; 16. Various (Paget C.C.), Miss Dunmore, certificate ; 17. Various (Paget C.C.), Miss Wall ; 18. Various (Paget C.C.), Miss Wall, silver medal ; 19. Cattle studies (Paget C.C. matt gold-toned), Dr. Hawksley ; 20. Various, Miss Wall ; 21. Various, Miss Wall. Class 4 (members only)—Enlargements :—22. Miss Wall, certificate ; 23. *Three Children* (bromide), Mr. R. J. Parkes ; 24. *Woodcroft Hall, Leek* (bromide), Mr. C. F. Depree ; 25. Miss Wall ; 26. Dr. Tordoff ; 27. Portrait (bromide), Mr. W. P. Brown ; 28. *Paul de Vigne in Human Nature* (Nikko paper), Mr. J. Hague, bronze medal ; 29. *Bidston Church* (Wellington & Ward's tinted bromide), Mr. C. F. Depree, silver medal. Class 5 (members only)—Instantaneous, set of four :—30. Dr. Tordoff ; 31. (Ilford P.O.P.), Mr. R. J. Parkes, certificate ; 32. *Race on Windermere* (platinotype cold bath), Dr. Hawksley, silver medal ; 33. Dr. Hawksley ; 34. Miss Wall. Not for Competition :—35. A portrait (Wellington & Ward's tinted bromide paper), Mr. C. F. Depree ; 36. Copy of pictures (Ilford P.O.P.), Mr. W. P. Brown ; 37. *Afternoon Tea* (Ilford P.O.P. matt), Miss Hurst ; 38. *Yellow Asters* (Ilford P.O.P.), Mrs. Cross. Class 9 (open)—Landscape and Seascape, set of four :—39–42. *Summer at Rhyl, Winter at Rhyl, Unrest*, and *Dawn* (P.O.P.), Mr. R. M. Evans, Rhyl ; 43–46. *Seaward, Wild Wales, A Lonely Shore*, and *A Landscape Lakeland* (P.O.P. platinum-toned), Mr. Smedley Aston, Birmingham, silver medal ; 47, 48. *At Low Water* and various (Solio paper, platinum-toned), Mr. E. L. Marriott, Bootle ; 49. Four landscapes at Windermere (platinotype), Mr. Richman, Seiton Park ; 50. Various (bromide), Mr. F. Moat, Doncaster ; 51. Seascapes (platinotype), Mr. C. F. Inston, Liverpool, certificate. Class 10 (open)—Enlargements :—52. *On the Hardanger Fjord, Norway* (platinotype), Mr. Dunkerley, Burnley, bronze medal ; 53. Enlargement from hand-camera negative (bromide), Mr. R. Evans, Rhyl ; 54. A portrait (bromide), Mr. Smedley Aston, Birmingham, certificate. Class 11 (open)—Instantaneons, set of four :—55–58. *Puddington Lake, Curling, Puddington Lake*, and *High Jump* (platinotype), Mr. C. M. Wane, Edinburgh ; 59. *School Sports* (Solio), Mr. C. M. Wane, Edinburgh, silver medal ; 60–63. *A Moonlight Departure, A Stiff Breeze, A Summer Evening*, and *A Race Home* (platinotype), Mr. Bennett, London, extra silver medal for *A Moonlight Departure ;* 64. *Yachts* (platinotype), Mr. H. Cole, Trinity College, Cambridge, bronze medal. Class 14 (open)—Figure studies, set of four :—65–68. Various (Ilford P.O.P.), Miss Fleming, Birkdale ; 69–72 Various (Ilford P.O.P.), Miss Fleming, Birkdale ; 73–76. A portrait, *A Crimean Veteran*, Studies of Heads (P.O.P. matt platinum-toned), Mr. Smedley Aston, Birmingham ; 77–80. *Repose*, portrait, *Comfortable*, and *Thoughts* (collodio-chloride and matt P.O.P.), Mr. Evans, Rhyl ; 81–84. *My Time is Done, Napping, Music hath Charms*, and *The Broken Bridge* (Matt P.O.P.), Mr. Anckorn, Arbroath, silver medal : 85–88. *Homeward Bound, Family Cares, A Round Dozen*, and *Tired Chums* (platinotype), Mr. J. H. Coath, Liskeard ; 89–92. *Professor Storey, Chums, Good Night*, and *Muriel* (silver), Mr. George Lafayette, Glasgow, silver medal. 93. Flashlight effects (platinotype), Mr. Fred Marsh, Henley-on-Thames, bronze medal ; 94. Flashlight effects (platinotype), Mr. Fred Marsh, Henley-on-Thames. Class 13 (open)—Scientific Photography :—95. Photo-micrographs, Mr. Ernest Jones, Rhyl, bronze medal ; 96. Flower studies (platinotype), Mr. J. H. Coath, Liskeard, certificate. Not for Competition :—97. "*Here's your good health*" (Ilford matt P.O.P.), Mr. Cross ; 98. A portrait (bromide enlargement, Mr. Cross ; 99. Flashlight effect (platinotype), Mr. F. Marsh, Henley-on-Thames. Class 7 (members only)—Decorative Transparencies, set of two :—100, 101. (Thomas's plates), Mr. H. J. Heaton ; 102, 103. Dr. Hawksley, bronze medal ; 104, 105. Miss Dunmore, certificate ; 106, 107. (Thomas's plates), Mr. C. F. Depree ; 108, 109. (Thomas's plates), Mr. C. F. Depree. Class 8 (members only) :—Lantern Transparencies, set of six :—110. (Thomas's plates), Mr. W. P. Brown, certificate (extra) ; 111. Flower studies (contact and reduction), Mrs. Cross, bronze medal for one slide, *A Very Acceptable Present ;* 112. Various, Mr. J. S. Dickin ; 113. Various, Miss Dunmore : 114. Various, Mr. H. J. Heaton, bronze medal ; 115. Various (Thomas's plates, hydroquinone developer), Mr. R. J. Parkes ; 116. Various, Miss Wall ; 117. Various, Miss Wall. Class 12 (open)—Lantern Transparencies, set of six :—118. Architecture, Mr. C. Baynton, Birmingham ; 119. Architecture, Mr. E. R. Bull, Forest Hill, London, silver medal ; 120. Various, Mr. S. Cato, Southport ; 121. Various, Mr. J. S. Dickin, Southport ; 122. Various, Dr. Ellis, Liverpool, bronze medal ; 123. Flower studies, Mr. Field, London ; 124. Flower studies, Mr. Fraser, New York, silver medal : 125. Various, Rev. C. H. Hatfield, M.A., Southport ; 126. Various, Mr. H. J. Heaton, Southport ; 127. Various, Mr. Hodges, Hulme ; 128. Various, Mr. Harry Holt, Liverpool ; 129. Various, Mrs. Marriott, Bootle ; 130. Various, Mr. E. Marriage, London, certificate ; 131. Various, Mr. Marsden, Southport.

FORTHCOMING EXHIBITIONS.

1895.		
November 19–21.....	*Hackney.	W. Fenton-Jones, 12, King Edward's-road, Hackney.
,, 22–30.....	*Stanley.	Walter D. Welford, 59 and 60, Chancery-lane, W.C.

November 28–30..... *Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.

December 20, 21..... *Nottingham Camera Club. W. Edgar, 123, Clinton-terrace, The Park, Nottingham.

1896.

March .... *Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

A BUSINESS TOPIC.

To the EDITOR.

SIR,—The remarks on *A Business Topic* in your last issue will perhaps awaken photographers to the fact that as a class they are exceedingly neglectful in looking after their trade interests. It is to the interest of all concerned in a trade such as photography that its members should hold together; firstly, to keep up the general standard of work; and secondly, to prevent prices from falling. Yet, in opposition to this, photographers appear to be constantly lowering prices, and, at the same time, the quality of their work. The question is, Where is this process to stop? Probably at the Bankruptcy Court for employers, and the workhouse for employees.

This matter of low prices must lead to low wages, this in its turn resulting in less competent men following the trade; for men of ability want good wages, and, if they cannot obtain them in photography, will seek other occupations. The trade thus sinks into the hands of less competent persons, who have not the ability to do the best work, and we have, as a final result, bad work, low prices, and low wages.

Good work is the first essential of success, and will still command its price, even in neighbourhoods that are supposed to be worked out. But how can good work be done without giving some attention to securing good workmen? This leads me to mention the reckless and slovenly manner in which the apprenticeship system is managed in photography. How many photographers are there who can say that they were thoroughly, systematically, and efficiently instructed in their craft? Yet sound training of apprentices is the foundation of good work. If the trade is to flourish, the present system of careless dealing with apprentices must be abolished. A strict system of apprenticeship and a high standard of work would effectually suppress that bugbear of photographers, the "amateur professional." Advertise for an assistant, and you will be inundated with replies from men who scarcely know the difference between a camera and a printing frame. Such men buy a cheap set of apparatus, produce some prints, and on this slender knowledge rove around, seeking some unsuspecting photographer willing to pay them for spoiling good material. With your permission, sir, I will give, next week, some interesting figures showing how this cheap and nasty work damages the trade as a whole.—I am, yours, &c.,

JOHN A. RANDALL.

118, *Cresgoe-street, Birmingham, November* 10, 1895.

IRON IN PLATINUM PRINTS.

To the EDITOR.

SIR,—I am much gratified that Mr. Baldock (see p. 709) confirms my work in finding iron present in all platinum prints. He must, however, have misunderstood something that I have said when he states that I found that platinum is capable of producing, with catechu, somewhat similar coloured products to those resulting from the reaction of catechu with iron compounds. I cannot imagine that metallic platinum and catechu are capable of combining to yield any coloured products at all, and I do not know of any experimental results that tend in the slightest degree to show that they do.—I am, yours, &c., CHAPMAN JONES.

11, *Eaton-rise, Ealing, W., November* 9, 1895.

PORTRAITURE BY GASLIGHT.

To the EDITOR.

SIR,—Seeing your reply to a correspondent in reference to portraiture by gaslight, the enclosed prints may prove interesting. The negatives were taken at night by the sole aid of a new arrangement of the Welsbach burner, which I hope to get on the market in a few weeks' time. There are only *nine* lights. The negatives were taken on the Mawson plate, with an exposure varying from four to seven seconds. I shall be pleased to hear your opinion of them.—I am, yours, &c., J. W. BEAUFORT.

25, *Colmore-row, Birmingham, November* 8, 1895.

[The prints sent are in every way admirable examples of portraiture.—ED.]

TONING LANTERN SLIDES.

To the EDITOR.

SIR,—I beg to enclose sample slide illustrating treatment by arrested toning, as per my letter in your issue of November 8, and your footnote. Almost any colours and any number of colours may be obtained by the process by progressive or gradual treatment.

Briefly, my method in this particular slide was: Secure green by somewhat short exposure of Alpha plate, then carefully paint over all portions desired to be retained green with Bates's black varnish, leaving uncovered those portions desired to be toned; allow varnish to dry; then soak slide in toning solution until fully toned. Allow slide to dry, then remove Bates's black by soaking in turpentine, assisting removal by a piece of cotton-wool; rinse in clean turpentine and allow to dry.

Shall be glad for you to report on specimen.—I am, yours, &c.,

ALGERNON BROOKER.

[The slide sent is of cineraria, and the colours obtained have a most natural effect.—ED.]

METOL-HAUFF FOR BROMIDE WORK.

To the EDITOR.

SIR,—Of all modern developers this seems to have been found the most useful, on account of its adaptation in various ways, which enables the developer not only to give great vigour but also softness.

At the present time of the year, when so much bromide work is being done for contact printing and enlargements, metol will be found extremely convenient.

Concentrated stock solutions can conveniently be made in the following manner:—

Solution A.

Metabisulphite of potash	1 ounce.
Metol	150 grains.
Water	10 ounces.

Solution B.

Carbonate of potash	3 ounces.
Water	12 ,,

For use take 1 part of A (·75) ¾ part of B, and from 10 to 20 parts of water.

Latterly it has been recommended to increase the quantity of sulphite of sodium in the metol developer, with the object of bringing out more details, and thus avoiding a tendency to fog, as would be the case when increasing the quantity of carbonate of potash. The simplest way of thus using the sulphite is to replace solution B with a solution C, as follows:—

Solution C.

Carbonate of potash	3¼ ounces.
Sulphite of sodium crystals.....	3¼ ,,
Water	17 ,,

For use mix 1 part of A, 1 part of B, and 10 to 20 parts of water.

Metol has in a greater degree than amidol the peculiarity of being restrainable by bromide of potassium solution, and the addition of a few drops to the developer will clear any surface fog which might become apparent. If, however, instead of adding bromide solution, a few drops of a ten per cent. hypo solution are added to the developer, this will already restrain development.

Metol offers the great advantage that it is not readily oxidised by air, and naturally a considerable number of enlargements may be made, one after the other, by adding to the old solution a small quantity of fresh developer from time to time.

I trust the above particulars may be of interest to the readers of your valuable JOURNAL.—I am, yours, &c., JULES FUERST.

17, *Philpot-lane, London, E.C., November* 11, 1895.

ORTHOCHROMATIC PHOTOGRAPHY WITH ORDINARY PLATES.

To the EDITOR.

SIR,—Under the above title there appeared in your August 16 issue an article by Mr. F. E. Ives, proving conclusively (?) that it is possible to obtain orthochromatic effect with ordinary (?) plates. Another writer is quoted as giving a contrary opinion, and is correspondingly sat upon. As an olive branch, we would like to tender the results of our experience. Animated by Mr. Ives's article, we made a screen of chrysoidine and deep naphthol yellow, but could not obtain satisfactory results. We then tried an aurentia screen, made by coating lantern-slide glass twice with the following solution, made according to Dr. Vogel's formula :—

Aurentia	3 grains.
Warm alcohol	25 c. c.
Collodion (two per cent.)	75 ,,

With this solution, we are pleased to say, we obtained good results. The point lies in the fact that we have tried an aurantia screen with other makes of plates, and have always obtained an under-exposed plate, showing no orthochromatic effect. That the Seed plate possesses orthochromatic qualities we have testimonials to show, and some years ago there was published in an American photographic journal a picture of a bouquet of flowers illustrating the fact. We are in a position to state that no special effort is made to make our plate orthochromatic, and the fact that it is so is purely incidental to our method of making emulsion. Accepting the above conclusions, the subject has changed from "Is an ordinary plate orthochromatic?" to "What is an ordinary plate?"—I am, yours, &c., MILTON B. PUNNETT, *Chemist*,

M. A. Seed D. P. Company, St. Louis, Mo., U.S.A.

THE TITLE OF CHEMIST.

To the EDITOR.

SIR,—There seems to be much misunderstanding about the title of "chemist." Perhaps you will permit me to explain that registered chemists do not pretend to have the exclusive right of its use. It is only when the title is used *in connexion with a shop for the sale of poisons* that any action at law is, or can be, taken by the Pharmaceutical Society.

You do the Pharmaceutical Society a great injustice by classing it as a trades union.

The Pharmaceutical Society exists by statute, and by that statute it is bound to perform a certain public duty; in fact, it exists for the express purpose of protecting the public.

If you will read the Pharmacy Act, you will see that it claims to be an Act *providing for the safety of the public*, and it provides a certain class, called chemists, to do this work. It provides that they must have special knowledge about the poisons they are to be allowed to sell. The qualifying examinations are watched over by a Government official, to see that they are according to the requirements of the Act of Parliament.

Now, where is the complaint? Is it not simply jealousy of the *incidental* monopoly which has been granted to chemists only? If so, why not grumble at policemen, and call the force a trades union? It exists, like the Pharmaceutical Society, for the safety of the public, and even "Cosmos" has no right to call himself a constable, nor right to act as one. So, if we are to sweep away monopolies, let us serve all alike. Does "Cosmos" really think that poisons should be allowed to be sold by any one?—I am, yours, &c., F. H. GLEW, *Chemist*.

156, *Clapham-road, London, S.W., November* 12, 1895.

AN IMPORTANT POINT FOR THE PHOTOGRAPHERS' COPYRIGHT UNION.

To the EDITOR.

SIR,—There is an important matter connected with photographers' copyright, that I have not seen noticed up to now, which should be brought forward at the next meeting of the Photographers' Copyright Union upon the 22nd instant, *i.e.*, the block, or *cliché*, made by the publishers from the negative of print lent to them by the photographer for reproduction. What becomes of this? Is it destroyed after being used for the one reproduction agreed for, or is it stored to be used again at some future time, without perhaps being paid for, or perhaps lent to some other publisher, or, may be, exchanged for another block with some Continental publisher? Should not the owner of the photographic copyright have the choice of either purchasing the block at its cost price, or proof of its being destroyed, and receive a guarantee that it should not be used again, or a duplicate thereof, so long as the copyright existed, without proper notice to the owner? There are so very many ways the unscrupulous will discover of defrauding, that I think every precaution should be considered and taken for the owners of photographic copyright, be they amateur or professional. Doubtless publishers, as a rule, are an honourable set of gents, and mostly open to fair dealing, but, as there are black sheep in every flock, and "opportunity makes the thief," it is but fair to both sides to have all dealings founded upon as sound a basis as possible. I will not encroach further upon your valuable space in this matter, at present, but trust this hint may be of some slight service to all concerned in the welfare of the Union and photographers in general.—I am, yours, &c., A COPYRIGHT-HOLDER.

November 11, 1895.

LEYTONSTONE EXHIBITION.

To the EDITOR.

SIR,—Will you kindly make known that we are prepared to collect any pictures entered for our Exhibition and transferred from Pall Mall to Hackney.—I am, yours, &c., B. HARWOOD, *Hon. Sec.*

MARKINGS ON NEGATIVES.

To the EDITOR.

SIR,—I am sending a few negatives, which I found when turning out some old ones of the years 1880 and 1881, for your inspection. These negatives are milky marked. Recently I had an enlargement to make from a negative of that period marked in the same way. I tried to take the films off the glass, and succeeded easily, in fact, as if the glass had been waxed before coating. The film itself was very brittle, but without milk marks, the latter being left on the glass, which shows these plates were coated with a substratum, and my idea is that this substratum was composed of water-glass, which latter acted on the glass itself. This proves what an important part the avoiding of dangerous substratum in the coating of plates is. I do not know if you have ever had an article on this subject in your JOURNAL, but think it would be advisable to draw the attention of dry-plate manufacturers to this matter for further investigation. Trusting you will excuse my drawing your attention to this subject, I am, yours, &c., AUDACIOUS OPERATOR.

Brighton, November 6, 1895.

[The negatives remain at our office for the inspection of any of our readers who may wish to see them.—ED.]

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted good exterior background; will give in exchange a ten-inch nickel burnisher (Perken & Rayment's).—Address, NORTON & VEREL, Wells, Somersetshire.

Wanted Thornton-Pickard shutter, time and instantaneous, 1½ inch hood, in exchange for quarter-plate folding hand-stand camera, focussing screen, one double dark slide, leather bellows, no lens, new last spring.—Address, T. ROGERS, 10, Staveley-road, Peckham, S.E.

Wanted a short-focus half-plate or whole-plate studio lens; will exchange an enameller with double cylinder, fourteen and a half inches long, with gas burner or a Tench No. 1 baby lens, rapid rectilinear or other long-focus lenses.—Address, MILTON MEYER, Enfield Town, Middlesex.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITOR, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon.*

PHOTOGRAPHS REGISTERED :—

John Webber, 45, St. George's-place, Canterbury.—*Two photographs of interior o Baptistery, Canterbury Cathedral.*

J. Kennerell, 7, York-row, Wisbech.—*Six photographs of James Smart, Champion Skater of England on ice or road, in various positions.*

Henry George Tunmer, 32, Anglesea-road, Ipswich.—*Photograph group of four Norwegian girls, three laughing, and one with face turned away. Taken on a lake in Norway.*

M. M. (Enfield).—We know of no special way of keeping the material. The query is, however, very vague, and we are doubtful if we fully understand it.

CHARLES BARSTOW says: "Did a review of the Amsterdam Photographic Exhibition appear in the JOURNAL? If so, will you kindly quote in what number?"—No such review appeared in the JOURNAL.

ENTERPRISE.—We are not surprised at your want of success. We should advise you to expose and develop the enlargements in the ordinary way, you will then get as much vigour as you desire. We know nothing of the special developer mentioned.

F. HUMPHRIES says: "Would you kindly let me know if there is any book or paper sold giving instructions how to make a camera?"—Look through the recent indexes of *Work* (published by Cassell), and probably you will find references to articles on the subject.

PALM says: "Can you oblige me with name and address of wholesale dealers in palms and grasses for decorative purposes?"—Possibly Martin Clare & Co., 26, Wilson-street, Finsbury, is the address you want. They supply dried palms and grasses for studio decoration.

H. C. R. (Barnsbury).—A collodion film has naturally a glossy surface and will show as such. The gloss may be much subdued by spreading the collodion on plain paper, instead of that with the enamelled surface, which is so very generally used for the purpose.

LIGHT.—The distance will depend upon the length of focus of the condenser, not its diameter. When you have arranged the apparatus, you will soon find the best position by moving the light backward and forward until the best illumination is obtained on the focussing screen.

AMATEUR (Lyndhurst).—1. There is no special work on the subject, but plenty of information upon it has appeared in the JOURNAL and ALMANACS during the past few years, and every elementary work on photography treats upon it. 2. There is no limit to size, but the larger it is the longer, of course, will be the exposure.

C. X. A.—We are not surprised that the apparatus has not proved to be of the first quality. It was not to be expected at the price, or even if it were double that paid. However, we happen to know the apparatus, and we can say it is full value for the money. Bear in mind that quality is, and ought to be, in proportion to the price paid for it and no more.

ARTHUR L. SMITH.—1. Presses for the purpose are supplied by all the dealers in photographic materials. 2. Certainly you will be doing wrong if the copyright in the engravings has not expired. We do not know if it has or not, though we surmise it has not. Why not write to the publisher to inquire? It is possible that permission to copy may be accorded, even if the copyright is still in existence.

T. S. HARGREAVES.—We have had no experience of the apparatus named, or know no one who has, so cannot speak as to its merits. We should certainly recommend the electric light, which can, of course, be worked from accumulators. They will, necessarily, have to be charged from a dynamo machine, or from the main. Are you aware of this? From the general tenor of your letter we suspect you are not.

J. B. O'K. says: "As a constant reader of your valuable JOURNAL, I wish to know if you could supply me with the name of some reputable photographer who could send me a machine on hire, and develop the negatives taken at a moderate premium. They (the negatives) would be of the landscape class, but of a particular kind, and I am particularly anxious to get them."—Apply to Messrs. Sands & Hunter, Cranbourn-street, Leicester-square, or Messrs. Morley & Cooper, Upper-street, Islington.

G. T. CARTER (Dalhousie, India) writes: "I would be much obliged if you would give me any information, through the medium of your Correspondence column in the JOURNAL, regarding the Copyright Act as it applies to India. I cannot find out how or where to copyright photographs in this country, and would be very glad if you could inform me on the subject."—Perhaps some correspondent will give our correspondent the information as to how to make photographs copyright in India.

W. BEATLY.—As there are some twenty or thirty ounces of residue to be dealt with, we should advise you to send it to a refiner instead of attempting to reduce it yourself, as you have no proper appliances for the purpose. The work could be done in small quantities at a time in an ordinary domestic kitchener, and directions for doing it will be found in back volumes, but space in this column is too limited to deal with it here. You will find it more economical to take our advice and send it to a refiner.

R. F.—1. If the views are on paper, there is no better way of trimming them than with a knife or a wheel trimmer. If on glass, then a diamond must be used. 2. If the films are perfectly flat, they may be simply laid on a plate of glass, or other flat surface, and the emulsion poured on in the usual way. If they are buckled, they must be secured to the glass by strips of gummed paper before coating. If collodion emulsion be employed, the celluloid must have a substratum of gelatine before the emulsion is applied, as the collodion would, otherwise, have a solvent action on the celluloid.

D. ROBINS complains of sores on the fingers, which he thinks are due to the use of metol, and asks for a remedy.—We have heard of the alleged pernicious action of metol on the skin, but, fortunately, have experienced no ill effects from its use ourselves. So far as we have learned, however, it seems that if the use of the material be discontinued, or the fingers be protected from further actual contact with the solution by the use of rubber "finger-stalls," nature will quickly work a cure, as in the case with the ill effects from bichromate of potash, and other things that might be mentioned. Perhaps some of our readers may be able to give a more speedy cure for the sores than that worked by nature, if so, some sufferers will be grateful.

PRINTER says: "I should be very grateful if you would give me your advice on sensitising albumen paper. I am using ——'s pink paper, with a sixty to seventy grain bath; but, with a good average negative, the prints are mealy, and lack the pluck which they ought to have. A second trouble, probably arising out of the first, is the lack of colour in the prints before toning (unless the printing is done in a very quick light), thus rendering toning very difficult. I have seen a salt bath before toning recommended; would you advise its use? If so, in what way? I have seen various things recommended as additions to the silver bath, but do not wish to get out of one trouble into another. I have been trying ready sensitised paper, and I find it gives plucky prints, and the prints are always red before toning, thus rendering even toning easy; but it prints with too much contrast, too heavy in the shadows. If I could get something between the two, I should be happy."—We cannot understand why the paper sensitised on a bath of the strength mentioned should not yield brilliant prints from good negatives. We should advise our correspondent to try a fresh sample of paper. We do not recommend the addition of other salts to the silver bath. As a rule, ready sensitised paper prints redder under the negative than does that of home sensitising. However, try another brand of paper, and see if it works better in your hands. If it does not, it may be assumed that the fault is with the silver solution.

J. F. S. says: "I wish to make a very considerable number of slides by reduction—150 or so in all; my business hours are very long, hence of necessity I must use artificial light. I have very little time at disposal, so wish to get through a considerable number per night. I have a reducing camera, my difficulty lies with the illumination of the negative; I have tried magnesium ribbon in strips suspended some distance from the plate. Neither of these are to my satisfaction. I then borrowed a friend's oil lantern, and threw the rays from the objective upon a sheet of ground glass behind the negative—a circle rather larger than the negative—but this is very slow, six minute's exposure was altogether too short. I estimated fifteen and twenty minutes would be required for each one. Have you any experience that would lead you to recommend fitting the lantern with limelight (blow-through jet), and throwing the light from the objective upon the negative? Do you think this would be satisfactory, and if it would reduce the time of exposure to a short one; and say what amount for average plucky negatives. I am working from 5×4 and ½ plate negatives?"—The limelight would reduce the exposure greatly, and would yield good results. It would be impossible to say what exposure would be necessary, as that must depend upon the light, the density of the negative, and the degree of reduction. We should recommend our correspondent to try magnesium ribbon again, placing one or two thicknesses of ground glass behind the negative, and keeping the burning magnesium in motion during the exposure.

PHOTOGRAPHERS do not advertise properly nor judiciously. The best form of advertising is not to make flaring announcements in the newspapers with catchy headlines. These will only catch a class of trade that is, perhaps, undesirable, and will not appeal to the family trade, which, after all, is the mainstay of the photographer's business. The distribution, about this season of the year, of a dainty study, properly mounted upon one of those Christmas mounts figured in the cut, would, we think, do more towards attracting trade to the photographer than any other form of advertising. Principally it would open the eyes of the public to the fact that there is perhaps no better present to make to one's friend than a properly executed portrait of oneself, and that there is no better way of presenting it than when the said portrait has been mounted on one of the above-mentioned Christmas mounts.—*Anthony's Bulletin.*

CONTENTS.

	Page
STEREOSCOPIC SLIDES FOR THE MILLION	721
REVERSED NEGATIVES ON GELATINE PLATES	722
THE LATE MR. J. TRAILL TAYLOR	725
FILMS AND HOW TO WORK THEM. By J. PIKE	726
ON THE SENSITISING ACTION OF DYES ON GELATINO-BROMIDE PLATES. By C. H. BOTHAMLEY, F.I.C., F.C.S.	727
THE PRINTING OF HALF-TONE BLOCKS	727
PHOSPHORESCENCE OF GELATINE PLATES. By R. MENHAUSS	728
NATIONAL ASSOCIATION OF PROFESSIONAL PHOTOGRAPHERS	728
OUR EDITORIAL TABLE	728
NEWS AND NOTES	729
RECENT PATENTS	729
MEETINGS OF SOCIETIES	731
FORTHCOMING EXHIBITIONS	733
CORRESPONDENCE	734
EXCHANGE COLUMN	735
ANSWERS TO CORRESPONDENTS	73

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

No. 1855. Vol. XLII.—NOVEMBER 22, 1895.

The number of letters we have received expressive of regret at the death of Mr. J. Traill Taylor has been so great that it is impossible for us to deal with them individually, and we therefore take this, the only available opportunity of acknowledging the many kind and sympathetic expressions of condolence, both with Mr. Taylor's family and ourselves, which have been conveyed to us.

We have also to announce that, in succession to the late Mr. Taylor, the proprietors of the Journal have appointed Mr. Thomas Bedding to the position of Editor-in-Chief.

OUR FORTHCOMING ALMANAC.

The Almanac for 1896 will be published on Monday, December 2. It will exceed its predecessors in size by a considerable number of pages. The frontispiece is a portrait of Sir Henry Trueman Wood, M.A., President of the Royal Photographic Society, the negative being by Mr. W. J. Byrne, and the prints by Messrs. Morgan & Kidd, of Richmond.

The Editorial articles deal with Photographic Optics and the Wet-collodion Process respectively. About 150 of the ablest photographic writers and experimentalists contribute articles, and several useful tables have been added to the volume.

MECHANICAL *VERSUS* CHEMICAL METHODS OF IMPROVING NEGATIVES.

A brief reference was made last week to chemical methods of improving negatives which have recently been demonstrated at some of the societies' meetings, and mention made that mechanical methods of accomplishing the same end seemed to be almost ignored by amateurs, although they are those most generally adopted by professionals. An intimation was also given that those methods might be dealt with at a future time. It was not, however, our intention thus early to recur to the matter, but we have since received letters asking information on the subject.

Many of our older readers will well remember that, some twenty years ago, M. Leon Lambert made a considerable stir in the photographic world with his method of working the carbon process. By this he claimed to produce prints in carbon that were superior to those made in silver from the same negative, and he certainly sustained his claim. His success, however, was not due entirely to his system of carbon printing, but was largely dependent upon his method of "dodging," or working up, the negative before attempting to print from it. The method was this: On the back of the negative was strained, and secured at the edges, a piece of very fine and thin mineral paper. Then, with a paper stump, very lightly charged with plumbago, he proceeded to strengthen the high lights of the face and the drapery—it was portrait negatives that M. Lambert mostly demonstrated with—and, if required, the shadows were also softened. When the finished negative was looked at from the front, it was seen at once that it was vastly improved by the treatment, though the time expended on a cabinet negative would not be more than a very few minutes. The retouching was merely a mechanical method of local intensification of such portions as could be improved by it. As the work was put upon the back of the negative, it could be roughly, and quickly, done, and it required no special skill for its execution. We merely refer to Lambert's system because it is the same in principle as those usually followed by professional workers now.

For very small negatives, or those from which lantern slides have to be made by camera exposure, the fibre of the mineral paper is an objection. It may be mentioned that all the mineral paper we have seen of late has been much coarser in texture than that which was procurable some years ago; therefore some finer medium is preferable for small work. Matt varnish fulfils admirably the conditions required. If the negatives are to be printed from in the camera, a fine grain is the best; but, for contact printing, a coarser grain may be used with advantage. On page 847 of the Almanac for the current year is a formula for a suitable matt varnish for the purpose, as well as the method of varying the grain.

Supposing we have a negative with excessive contrasts—*i.e.*, strong in the lights and feeble and lacking printing details in the shadows—adopting somewhat the Hibernian's idea of raising the roof of his cabin by lowering the floor, we reduce the lights by intensifying the shadows. The back of the plate is coated with the matt varnish. Then from the denser portion it is scraped away with the point of a penknife. This at once secures greater harmony. Next the too faint details in the shadows are gone over, on the varnish, with a tolerably fine paper stump *very* lightly charged with black lead, and the finest ones with a pencil. The extreme shadows rarely require any treatment, though they can, of course, be softened with the stump if it is considered necessary.

Instead of a negative with excessive contrasts, let us take another of the opposite character—one in which the contrasts require emphasising. Here, as before, we coat the back of the glass with matt varnish, and proceed, with the stump and black lead, to strengthen the lights, and, if the negative is a small one, the finest detail may be traced over with a lead pencil. When that is done, it will be found that the negative has been greatly improved; but we do not stop at that, but still further increase the contrasts, if required, by scraping away the varnish from the deeper shadows, leaving only the bare glass. By these simple means, a poor, feeble negative can be quickly converted into one that will yield bold and vigorous prints; or a crude and hard one may be transferred into one that will give harmonious impressions, while the prints will show no evidence that the negative has been "dodged."

In extreme cases the result can be heightened by slightly tinting the matt varnish with one or other of the coal-tar colours, though that is rarely necessary. On the Continent tinted collodion is frequently used instead of the matt varnish. That is free from grain, and it would sometimes be advantageous to use it when lantern slides are to be made from the negative by camera exposure. The collodion for the purpose should be of a porous, or rotten, nature, otherwise it will be liable to rag at the edges in the scraping away. We here append a few hints in working.

As all the work is on the back of the negatives, it may be quite roughly done as it becomes softened by the diffusion of light in its passage through the glass. The negatives must be printed in diffused light, or, if in direct sunlight, the frames must be kept moving the while. If the negative is on the thin glass, now so common with plates for hand cameras, it will be advisable to back it with another glass, and put the varnish and the work on the outer side of that, so that the light gets more diffused in the printing. The work applied with the stump, or the pencil, should not extend beyond the part to be strengthened if it can be avoided. It must be borne in mind that the black lead must be applied *very* sparingly because it stops out far more light than most novices would surmise. After scraping away the varnish it is often advisable, with very small negatives, to slightly destroy the abrupt edges by scratching them a little with a needle point, particularly if the glass is very thin.

The great advantage of the mechanical method of improving negatives is that that the work is rapidly done, and there is no risk of injuring the negative, as there is with the chemical one except in the hands of experts, as it remains intact. Further, if the result, at the first attempt, is not satisfactory, the work can be quickly cleaned off and commenced afresh.

REVERSED NEGATIVES ON WET PLATES.

Very many wet-plate workers are precluded from using the method of producing reversed negatives in a single operation, to which reference has been recently made, owing to the inconvenience, if not impossibility, of preparing dry bromide plates in the limited dark-room space at their disposal. At the same time, the departure from the usual routine necessary to improvise a wet plate suitable for the purpose is not so great as to be beyond their power of coping with it, and we propose, in the present article, to show how, with little extra trouble, the difficulty may be met.

We may premise that, although a film of pure bromide of silver is the best to employ, it is not necessary, as some seem to imagine, that it be dry; still, with ordinary bromo-iodised collodion, it is possible to arrive at a result that may be equally good, but it will be at the expense of a great deal more trouble, and will be surrounded by a considerable amount of uncertainty, owing to the iodide of silver present. This salt is supposed, though erroneously, to be unaffected by the alkaline developer, for, with a sufficiently powerful solution, it is as completely reduced as is the bromide, though, under the ordinary circumstances of working bromide plates, it may be considered as practically unaffected by the ordinary alkaline developers.

The effect, then, of using the every-day bromo-iodised collodion would be that the image first developed would consist of the silver reduced from the comparatively small proportion of bromide in the film, while the larger proportion of silver iodide would remain after the removal of the silver image, partially filling what should be the shadows and half-tones of the finished negative; but it is palpable that the iodide of silver that has resisted the first action of the alkaline developer will do so again; that is to say, when the second development is performed to reduce the hitherto unreduced bromide, the whole, or, at any rate, the greater part, of the iodide will remain intact, and will be easily removed by the ordinary fixing bath from both lights and shadows alike. Thus, in using bromo-iodised collodion, we must expect, in the first place, a comparatively thin image, but what is of greater moment we have the unaltered iodide of silver constantly interfering with a proper judgment of the progress of the operation, at no time so easy a matter as in the case of the development of an ordinary negative image.

The choice of methods of procedure lies, then, between making a special bromised collodion, modifying that in ordinary use or employing it in its unaltered condition, the chances of success decreasing with the different methods in the order named; but, as it is scarcely more trouble to make the special collodion than to "doctor" another sample, we should strongly recommend in all cases that bromide collodion be used.

In order to adapt the usual bromo-iodide collodion to the purpose in question, little more can be done than to increase, and that largely, the proportion of bromide to iodide. This will, at least, provide a film stronger in reducible silver, and so lead to the formation of a stronger image. As regards the iodide present, there is no practically available method of removing it, or, which would be equally useful, of converting it into bromide of silver, though, if the converse were the case, the matter would be simple enough. All we can do, then, is to let the iodide remain, and treat it as so much inert matter, to be removed in the final operation of fixing.

The addition of four or five grains of bromide of cadmium to each ounce of collodion will give it a sufficient "body" to adapt it for alkaline development. Even more may be used if it be found on trial that the particular sample of collodion will bear it; but, as a rule, the quantity given will be found as much as can conveniently be used. The ordinary bath *may* be employed if not below the strength of thirty-five grains to the ounce, but it is better at forty grains, and better still with so large a proportion of bromide, sixty grains. But, as we are writing of ordinary dark-room work, we do not lay any great stress on the necessity for a special bath. The plate must, however, be left in the bath for a much longer period than is usual in every-day practice, owing to the much slower forma-

ion of the bromide of silver; ten minutes or a quarter of an hour will generally suffice, or until the film presents a dense, "creamy" appearance.

On removal from the bath, the film is thoroughly washed under the tap, in order to remove the whole of the free nitrate of silver; this is of the utmost importance, in order to avoid general fog on the application of the alkaline developer, and, to make sure of the total removal, or rather conversion, it is advisable to soak the plate for a minute or two in a weak solution of common salt, and, finally, again wash before exposure. Salt is preferable to bromide of potassium or other soluble bromide, as it has less effect on the sensitiveness of the film. The plate is then ready for exposure, but it must be placed in a clean slide or carrier, not in one that has been used for ordinary wet plates, or the silver clinging to it will produce indelible and hopeless stains.

If it be decided to employ a special collodion, this may consist of the usual plain collodion employed for wet work, with the addition of three grains of bromide of ammonium and four grains of crystallised bromide of cadmium to each ounce. This will form a sufficiently dense film for ordinary purposes, as it is not desirable to have too thick a layer of sensitive material, owing to the difficulty that then arises of carrying the development of the shadow portions right through to the glass. The strength of bromide may even be less than this, one-fourth more than the above quantity of plain collodion being used with the same weight of bromides, and this is the formula we should recommend in first trials. The bath for this collodion may be thirty-five or forty grains to the ounce, though here, again, a sixty-grain solution will not only do its work more rapidly, but will materially increase the sensitiveness. A quarter of an hour's immersion, or even twenty minutes', followed by thorough washing and treatment with salt, will bring the plate into condition for exposure.

As regards exposure in the camera, it is impossible to say anything definite as to the relative sensitiveness compared with a bromo-iodised film prepared under ordinary conditions, as so much will depend upon circumstances; but, as a rule, it may be said that, though it is not lower, and in the case of bromised collodion, especially with the strong bath, it will be considerably greater. One or two trials, however, will soon settle this question. The duration of exposure should be such as would come under the term of "full," that is to say, ample time should be given, without over-exposure to the extent of destroying the due gradation of the image. What is required is to impress the high lights—as they will be, in the positive, produced by the first development—sufficiently to enable the developer to reduce those parts right through the film, where clear glass shadows are required in the final negative, and that without causing any appreciable amount of surface fog, which only results in a general thinning of the finished image.

For this purpose a full exposure is required, followed by a strong but well-restrained development, so that the progress of the operation can be watched carefully. To the inexperienced eye it will be difficult at first to judge the precise point to which development should be carried, as the conditions are so different from those prevailing under ordinary development; but it is better to be on the side of overdoing it than the reverse. In the former case, a portion of bromide of silver, that should go to form the final image, will be reduced in the formation of the first, and so the ultimate result will be somewhat thinner than it would otherwise be; but, in the case of under-development, a portion of the bromide will remain unreduced in what should be the clear shadows of the negative, and thus produce a general reduction or veil when the second developer is applied. The difficulty of judging naturally increases with the thickness of the film, and, as a matter of course, the more bromide there is present the harder work will be required, both to impress and reduce it through the whole film. Hence the desirability of as thin a film as can conveniently be employed.

When, however, iodide of silver is present with the bromide, the difficulties are increased in all directions; the development is slower, and the admixture of unreduced iodide renders the accurate judgment of its progress very uncertain, and even after clearing off the first image it is impossible to tell whether what remains in the shadows is simply iodide of silver or unreduced bromide from insufficient development. If the developer be made strong enough to act vigorously in the iodide—a strength of thirty or forty grains to the ounce of caustic potash is what is required—then the whole of the bromide would be reduced, or practically so, and the final image would be dependent entirely upon the iodide unreduced in the last development.

One other alternative we omitted in our first summary of methods, namely, the conversion of the bromide into iodide in the first instance, so as to form a pure iodide of silver film. This is easily done by immersing the plate after sensitising in a fifteen or twenty-grain solution of iodide of potassium, instead of salt, and washing well before exposure. The development in this case will be with pyro, six grains; caustic potash, thirty grains; and iodide of potassium, five grains, to each ounce of water. This plan we have only tried in an experimental way, so are unable to speak as to its practical utility, but we give it as a possible way of avoiding a special collodion.

For occasional use in making reversed negatives or positives direct from the original, this method of working will prove useful to those who have not the convenience for preparing *dry* plates.

The London County Council and the Photographing of the London Bridges.—The following is an extract from the Report of the Bridges Committee relating to this subject:—

"We have to report that it is necessary for the bridges belonging to the Council to be photographed, as questions have arisen involving the Council's interests in the structures and their approaches. We accordingly requested a few persons to submit tenders, and at the same time asked the chemist whether he would undertake the work, and at what cost. The chemist states that he will take 100 direct photographs, 24 × 18 in., at a cost of £207; this includes the sum of £90, for the purchase of the necessary apparatus, camera, lens, &c., and £15 for travelling expenses. The lowest tender is that of Messrs. W. M. Spooner & Co., being £128 3*s.* if the Council retains the negatives, and £121 3*s.* 6*d.* if it does not do so. We have made enquiries as to the necessity of the Council purchasing a camera, and we are informed that it is advisable to have one, as photographs are often required in connection with improvements, main drainage, housing of the working classes, bars and gates, and other matters which the Council has to do with. We have therefore come to the conclusion that it would be to the advantage of the Council to have the photographs taken by the chemist. We recommend:—

> "That, subject to an estimate being submitted to the Council by the Finance Committee, as required by the statute, the bridges belonging to the Council be photographed at an estimated cost of £207, and that the chemist be instructed to carry out the work."

We invite the opinions of our readers on the latest action of the

London County Council. It is probably a good thing for the Council to pursue a policy of constituting itself its own employer, but the circumstances surrounding this latest example of its progressive policy are certainly open to criticism on the grounds of expediency, economy, and wisdom.

Liquefaction of Gelatine.—According to MM. A. Dastre & N. Floresco, gelatine loses the property of forming a jelly if left in contact with an alkaline chloride or iodide.

International Congress of Applied Chemistry.—The second meeting will be held next year in Paris, and photography will form one of the subjects treated in the ten sections under which the subjects will be organized.

Applied Photography in Africa.—A new monthly journal under the name of the *Scientific African*, dealing with South African science, arts, and crafts, is announced. The important literary matter dealing with the included subjects will be illustrated with photographs of interiors of factories, the workings of mines and quarries, bridges, harbour works, special processes in agriculture, and other industries by which the wealth and comfort of South Africa is being enhanced. This is a large programme, and if something of a similar nature, as regards amplitude of photographic illustrations, were produced in this country, technical literature would be none the worse for the novelty.

Liquefied Sulphuretted Hydrogen.—As a precipitant for the silver in hypo residues, sulphuretted hydrogen might be looked upon as a typically perfect reagent; but there is so much trouble in connexion with its production, that it is never likely to be employed for this purpose as ordinarily made. A writer in *Nature*, however, in replying to a correspondent inquiring as to the new sulphur compound used in lieu of this gas—ammonium thio-acetate, states that liquefied sulphuretted hydrogen is readily procurable from the chemical dealers. The price of a bottle containing a pound, equal eleven cubic feet, is only a few shillings. Where large quantities of hypo were dealt with, or convenience for carrying off the fumes existed, the gas procurable in this form might have a useful career.

Toxicity of Acetylene.—Having regard to the possible frequent use of this new illuminant, the question of its possibly poisonous properties, if inhaled, has come to the fore. Its odour, however, is sufficiently markedly unpleasant to render its presence at once perceptible—unlike the poisonous "water gas," which can be diffused in the atmosphere in deadly quantity without the olfactory nerves giving warning. However, on the authority of M. Gréhant, who has recently made a report on the subject to the Paris Academy of Sciences, it may be stated that, though it is not so poisonous as coal gas, it still is poisonous if inhaled in large quantities. M. Gréhant states that it is very explosive mixed with oxygen, in reference to which quality a curious statement has been going the rounds of the papers, to the effect that, if mixed with carbonic acid, it burns equally well, and ceases to be explosive. Possibly carbonic oxide, as a diluent, is meant.

Old and New Star Photographs: a Suggestion.—The "Fellow of the Royal Astronomical Society," correspondent of the *English Mechanic*, writes as follows:—"Our famous astronomical photographer, Dr. Isaac Roberts, F.R.S., has made a suggestion so eminently practical that it deserves all the publicity that can be given to it among those interested in the physical structure of the universe. It is, briefly, that careful comparison should be made between the earlier photographs of different stellar regions contained in his new classical work, *Photographs of Stars, Star Clusters, and Nebulæ*, and the recent ones, which are now in course of publication in *Knowledge*. As the photographs are all enlarged to an identical scale, changes, if any, which may have taken place *inter se* will be deducible from measurements which it is within the power of almost any one to make, since any change of position exceeding 3″ may be determined without difficulty. For this purpose, Mr. Roberts recommends a scale ruled on glass, while for the measurements of angles of position one of the transparent horn protractors—purchasable wherever drawing instruments are sold [at the price of a few coppers.—Ed.]—will answer perfectly. Of course, though *the* way of detecting changes is by superposition of the original negatives, or of glass positives taken from them—and I believe Dr. Roberts is making some arrangements which will enable those engaged in this branch of research to make comparisons in this manner—here is a fruitful field of investigations."

PIGEON POST MICROGRAPHIC DISPATCHES DURING THE SIEGE OF PARIS, 1870–71.

[Read at the Vienna Photographic Association, October 1, 1895, by Herr Bayer, Engineer.]

A FEW weeks ago the twenty-fifth anniversary of the capitulation of Sedan was celebrated in Germany. At that time the belt which was being made round Paris by the German army was being drawn closer and closer, till at last, on September 21, 1870, Paris, the capital, was completely hemmed in. All roads and railways were occupied by German troops, all telegraph lines were destroyed, and every communication by land or water was cut off.

There was then but one way left to get out of Paris, and that was through the air. The French, who were the inventors of aërial navigation, did not hesitate long, and on September 23, two days after the city was shut up, the first balloon left Paris and descended safely in the provinces. A regular balloon post was then instituted by Postmaster Rampont. The balloons were made in specially arranged factories, and at intervals of three to seven days balloons continued to leave Paris with a quantity of letters and carrier pigeons, the latter being sent for communication from the provinces with Paris. Letters were written on very thin paper, rolled up and enclosed in a quill, and fastened to a tail feather of the pigeon. Necessarily the pigeons could not be heavily laden, and the news from the provinces was consequently very meagre.

It then occurred to the photographer Dagron—well known for his photo-micrographic work—to print all the communications upon large sheets of paper, to reduce them microscopically, and from the negatives to make collodion positives, which he then stripped from the glass. These collodion pellicles being very light, many of them could be sent by a single pigeon. After arrival of the carrier pigeons in Paris, the positives were to be enlarged by electric light and projected upon the wall of a room specially appointed for the purpose, and the news could then be published throughout Paris by the newspapers. The idea was fully approved by the Minister of Finance, Picard, also by the Postmaster, Rampont, and by decree of November 10, 1870, Dagron was empowered to organize the service in the provinces.

On November 12, at nine o'clock in the morning, the balloon, "Le Nièpce," ascended with Dagron and his assistants—Engineer Fanique, Poissot, Guoccni, and the aëronaut Pagano. Dagron's apparatus was also packed in the car. At the same time another balloon, the "Daguerre," ascended with three passengers, dispatches, and photographic apparatus.

Amidst sympathetic manifestations of the assembled crowd, both balloons sailed away in a fresh east wind; but the consequences of this expedition were destined to remove the anxiety which reigned in Paris. When the two balloons arrived over the German lines, they encountered a lively fire, and the bullets whistled around them and struck the "Daguerre," which fell from its dizzy height upon the wall of some farm buildings near Ferrières, and thus came into the hands of the Germans. This fate would soon have overtaken Dagron's balloon. The sandbags, which contained the ballast, were torn, owing to the bad material of which they were made, and the sand was lying at the bottom of the car, and could only be thrown out in small quantities. The balloon also was porous, and travelled very low. It was therefore decided to land as soon as possible and place the apparatus in safety. The descent was made without great mishap in the neighbourhood of Vitry. The peasants, who hurried to the spot quickly, provided the travellers with blouses and caps for disguise, and scarcely had the apparatus been placed upon two carts when a German patrol arrived and captured the balloon and one of the vehicles. The other got off; and, with help of the inhabitants, Dagron and his companions succeeded in

reaching Tours on November 21. There they immediately presented themselves to Gambetta, who, as is well known, also escaped from Paris by balloon, and gave notice of the decree.

The Government at Tours had meanwhile considered a somewhat similar proposal from the chemist Burreswil, with the intention of carrying it into effect, and, on November 4, had ordered the institution of a Photographic Dispatch Service. The photographer Blaise, of Tours, commenced the work, but the dispatches were prepared upon paper, two printed pages on each sheet, but the grain of the paper made the reading very difficult, and the whole organization, besides, was very imperfect, so that, from October 26 to November 12, no news whatever reached Paris.

Dagron then demonstrated his process before the Post and Telegraph Master, Steenackers, who had been appointed by the temporary Government; it was received with great approval, and the paper process was immediately abandoned.

Dagron's collodion pellicle, besides being lighter and better defined, had also the advantage of greater speed, the exposure being only two seconds, whereas paper prints required two hours for their production. These thin pellicles had also the advantage of being quite transparent, and could easily be enlarged by electric light.

With the help of his assistants, Dagron now began the reproduction of the official and private messages. Through the newspapers it became known that the greater part of the apparatus had been lost, and two amateur photographers, Delezenne and Dreux, of Bordeaux, placed similar apparatus at their disposal. The dispatches were delivered with astonishing quickness; at mid-day they were printed on large sheets of paper, put together, and at five o'clock in the evening ten copies on pellicle were already in possession of the administration. The pellicles measured about ten centimetres square, each containing a reproduction of twelve to sixteen folio sheets of print, and an average of 3000 messages. To each pigeon was allotted up to eighteen of these pellicles, therefore more than 50,000 messages, which weighed less than a gramme. The pellicles were rolled up and packed in quills in their usual manner, and their pliability and impermeability to water rendered them specially suitable for the purpose. Some pellicles miscarried thirty-eight times before they reached Paris. The pigeons suffered severely from cold and snow.

The number of private messages was quite astonishing. They were always composed in telegraphic style, and even postal orders and drafts were promptly paid in Paris upon authority of the pigeon post. The total number of messages of all sorts amounted to two and a half millions. The apparatus worked very satisfactorily on the whole, and, when the pigeons were not delayed, the rapidity of communication was excellent. The following is an example: Dagron was in want of chemicals, especially gun-cotton, which he could not get in Bordeaux. He therefore ordered them by pigeon post from Poulence & Wittmann, in Paris, on January 18, and asked that they might be sent in the next balloon. On January 24, six days after the dispatch of the pigeon, the goods ordered were delivered to him. The pigeon had flown to Paris in twelve hours. The telegraph and railway could not have done better.

During the siege of Paris, sixty-four balloons in all ascended. Of these two disappeared totally, and five fell into the hands of the German army.

Though these balloons also brought a large number of letters to the provinces—about 4,000,000 in all—the chief value of these balloon voyages was attained through the micro-photographic pigeon post. By its means Paris, although completely surrounded by the enemy, was not cut off from the rest of the world, and thousands of families blessed Dagron for his wonderful idea, the accomplishment of which kept them informed of the fate of their relatives in the provinces and with the army; and so, in those days of trouble, the photographic art brought happiness to mankind, as it has done in thousands of other ways.

At the end of the above lecture specimens of the messages were projected on the wall by means of the lantern.

"A BLIND LEADER OF THE BLIND."

Of the violent hostility of certain recent critics, and of one in particular, and of their apparent wilful blindness to the best features of modern pictorial photography, the present article treats, and some concluding suggestions are offered as to the direction in which aspirants towards artistic results should work, albeit it should be understood that the writer is not prepared to go so far as to say that even the most enlightened and most worthy photograph ever yet produced is, without qualification, to be called art.

The London Exhibitions in their advent and their presence have been productive of much writing that is interesting, instructive, and amusing. The mere criticisms of the Exhibitions in the photographic press are much of the same character as usual with, however, somewhat less acrimony, and more generally temperate in language.

The general press has been for the most part laudatory, and any especial references to certain pictures or workers have been of a safe and guarded character. This, however, with one noteworthy exception; and the entirely different key, the widely divergent judgment expressed in the *Daily Chronicle*, as compared with almost everything else that has been written, is a circumstance that most people will surely desire to see accounted for.

Perhaps it is giving the *Daily Chronicle's* notices too much distinction to thus single them out.

Perhaps a certain savageness and the prejudice which are so evident in the notices referred to, sufficiently justify one's seeking to go behind the writings, so to speak, to get a look at their author, and having ascertained the authorship (and it appears to be now no secret) it is not saying too much, that these criticisms straightway lose their value. They were reprinted a week or two ago in these pages, and appropriately headed "Hysterics"—the performance of one whose judgment has from some cause become warped, and whose sayings are therefore not to be taken seriously.

They should, however, be read by every photographer and the style duly remembered, because these are not the first, and will probably not be the last, of the kind which the same writer will find occasion to publish in the democratic organs honoured by his contributions.

Now, when a writer persistently and untiringly, one might almost say savagely, writes down everything photographic which is not content to lay down and humble itself before any one assuming authority in art, one begins to doubt his honesty of purpose, or indeed whether he really intends all he says to be taken seriously. Violent hostility and misrepresentation never did any cause much harm or contributed good to the side espoused, and one has come to regard such writing as part of that systematic self-advertisement which some writers and artists of the newer school carry to such sublime perfection.

Of course, for a photographer to thus arraign so distinguished a person is, I know extraordinary impertinence, but then the present writer is not over awed even though a man be born in America and believes himself to be the first black-and-white artist in Europe; moreover, it is well that his hysterical utterances with regard to contemporary photography should not be quietly passed by and tacitly accepted as deserving of respect, which I, for one, would readily accord to any hostile criticism which bore the stamp of sober and unbiassed judgment.

Some of the remarks in the *Daily Chronicle's* article on The Salon are little short of idiotic—they are as intemperate as they are untruthful; the same statements made of an individual, instead of being launched against photographers as a class, were slander; as it is, the absence of a mere shred of truth upon which to weave a great deal of the fabric which is given would imply utter ignorance or misconception of photography, photographers, and their claims and intentions, but that we know the writer to be very well informed, or at least to have excellent and frequent opportunity of obtaining intimate acquaintance of the very matters which he now seems to intentionally misunderstand.

The article in question commences with "Between art and photography there is a great gulf fixed." Of course, no sort of reason for such a conclusion is given; nothing by way of argument is vouchsafed. The dogmatic utterance is quite typical of the language of not a few in these times who, with equal indifference to either the logical or truthful, force their way by frequent reiteration and loud speaking. How else are we to read the remark "He" (the photographer) "not only believes that he is artistic, but he is cocksure of the fact that there is no other art in the world but his own?" Is not this wilfully ignoring the truth? would not five minutes' conversation with any photographer, say any exhibitor at the Salon, have shown the reviewer that, amongst such men, utmost reverence is felt for all acknowledged fine art? Such a statement, then, is deliberately untrue.

Further on we read: "These new photographers are not content to be photographers, they must be real artists, even if they have to forego all knowledge of drawing, of composition, of light and shade, of selection, of arrangement. What does it matter? At the psychological moment, do they not put their head in the black bag and pull the string? Luck, chance, or some other fellow, does the rest."

Is not all this wilful misrepresentation? Do not photographers pay as much attention to drawing, composition, light and shade, selection, arrangement, &c., as they do to the chemical and

mechanical part of photography, and pay that attention to better purpose, one would imagine, to judge from results, than perhaps the very writer who thus vilifies them?

Tens of thousands of men and women who read the columns of the *Daily Chronicle* know positively nothing of photography, or what photography in artist hands can, and does, accomplish. Most of them will be incapable of seeing through the veneer which in this article thinly covers jealousy and intolerance; they will accept it all as the authorised opinion of the particular daily paper which they have long been accustomed to regard as an oracle on all matters outside their immediate observation.

It is a pity that the people's paper should not be more careful as to the opinions and judgments it places in the hands of the untutored. It should be warned against writers who may not hesitate to mistake the trust which the office implies.

If in this instance it is not a mistake, then one must conclude that the writer is telling the people of something about which he knows but little, verily a *blind leader of the blind*. I have to thank this same reviewer for the expression, and may well return the past compliment.

The whole tone of the *Daily Chronicle* article on the two Exhibitions can only impress the thoughtful reader as the not too tasteful expressions of one whose care for either art or photography is of far less moment than the desire to do something smart or eccentric for notoriety sake, a proceeding which might even shock the consciences of "The Devils of Notre Dame," and make them hesitate to own their patron.

But quite enough has been said about the "*Daily Chronicle's* attack of Photographic Hysterics," and I may, with perhaps more profit, return to the opening sentence and one other excerpt, as pegs whereon to hang some suggestions. "Between art and photography there is a great gulf fixed," coupled with a subsequent remark, "Still among the exhibitors at the Dudley Gallery there are three or four men whose works demand respectful attention. Curiously enough, they are either professional photographers or professional artists," &c. These will serve our purpose.

Photography, then, though for ever widely separated from art may, in the hands of a professional photographer, or artist, at least, "demand respectful attention." This is at least one step in the right direction. But why and on what grounds is this "great gulf of separation" insisted upon? Is it because of the difference in motive, performance, and achievement between the man "snap-shotting" hither and thither and the painter, who with refined sense and perception, accomplishes great art work? Is it because of the difference between the average photographic view and a Constable or Turner, or even a moderately good black-and-white sketch?

A. Horsley Hinton.

(*To be continued.*)

CARBON JOTTINGS.

[West London Photographic Society.]

I have chosen pigment printing first, as it is a less hackneyed subject than most of the photographic processes, and is also one in which I have had more experience and pleasure than in any other. It would also appear to be one that is avoided by most amateurs on account of its apparent difficulty, a difficulty which exists entirely in the imagination of the student, as will be amply demonstrated after one trial. Before explaining the details of the process it would, perhaps, be advisable to discuss its merits over others. In the first place, together with its chief rival, platinotype, it is permanent, thereby leaving all silver processes far in the background; but, unlike platinotype, it is not restricted to one or two tones, but any colour of pigment of a permanent character may be used; but, again, unless the more troublesome double transfer is resorted to, the surface is not so good as platinotype, owing to the gelatine. A newer paper, home-sensitised, has been used by Mr. Maskell with excellent results, as it gives a pure matt surface, and is used without any transfer, but I regret that I can give you no personal experiences with it. As regards the expense of carbon, as compared with platinotype, I find that all is in favour of carbon. As regards the printing, one slightly prints out, and the other does not; but, by using an actinometer, I think I may say that I lose fewer prints from over or under-printing by the carbon than by the platinotype process. Undoubtedly the one great fault against carbon printing is the fact of its non-keeping qualities, and therefore, unless the printer can dispose of a dozen cut pieces within the fortnight, it is a process hardly to be recommended. Of course, by sensitising one's own tissue this difficulty would be overcome; but, maybe, others would arise in its place. It does not take long to print a dozen photographs certainly; but, at this time of the year, when the days are so short and a week's fog may at any time be expected, it would be dangerous to invest in a larger quantity.

Describing the process, the lecturer said: In the first place, you must understand that it is altogether different from any silver-printing process you may have used, either by printing out or development. There is no sensitising in the silver bath, no hypo-fixing bath, and no toning bath. It is developed with hot water and nothing else, and the tone or colour of the print is settled beforehand. With the same negative the same colour is obtained with every print, and, once it has been developed, there is no fear of its altering. This will at once be evident when you know how the tissue is manufactured and the cause of the result. Paper is coated with gelatine, mixed with the required pigment to colour it, and sensitised with bichromate of potash, and on exposure to light it becomes insoluble in hot water. On exposure behind a negative, as in other printing processes, the amount of light that reaches the coating is dependent on the thickness of deposit on the glass, or, in other words, on its density. All the light will be admitted through the clear glass or shadows, a less amount through the half-tones, and none through the densest deposit. But here we find the first difficulty that met the pioneers of the process. As the light acted on the upper part of the gelatine, on development it was found that there were no half-tones. The part that was unaffected by the light was imprisoned under the affected part, and so was not reached by the water, or, if it was, on the soluble portion being washed away, the support of the upper part being removed, it also disappeared. This, of course, could be obviated by printing through the paper; but the time required would render it impracticable. The difficulty was eventually obviated by transferring the gelatine, after printing, from the paper it was printed on to another support. This may be either paper or linen or glass, or any substance that is suitably prepared. As most of our prints are done on paper, I will describe the process of transferring on to that material. First, the paper or final support is coated with gelatine rendered insoluble by alum, and which can be prepared in any quantity that may be convenient, as it will keep any length of time. When required for use, it is placed in a tray of water, and the tissue, when taken from the printing frame, is placed in with it, face downwards. Care must be taken that no air bells attach themselves to either the tissue or the support, as they will result in blisters on the finished print. After remaining in water about a couple of minutes, or until the tissue is seen to straighten itself out, the two are brought out together and squeegeed into contact. They should be left to dry for about twenty minutes or so, either under pressure or hung up by the corner, and, of course, whilst drying, we can be treatiug others in the same way. After that time the two are placed in hot water, of a temperature of about 100°. I generally use the water as hot as I can bear my hand in, unless I fear under-exposure, when I should use it at a much lower temperature. When the gelatine is seen to issue from the edges of the paper all round, the old support can be gently lifted up at one corner and gradually removed from the tray, leaving the pigment on the final support. By gently shaking the paper in the water, it will be seen that the gelatine is dissolving, taking with it the colouring matter, and very shortly the outlines of the picture should appear. We may now support it on a piece of wood or glass, and with one hand gently throw the water over it until the paper is clean and the picture fully developed, remembering that it will dry slightly darker. When finished, place it in a bath of alum and water, to further harden the gelatine and to eject the bichromate, which will have have stained the paper yellow; rinse in water and hang up to dry.

In the description I know this sounds rather a long process, but in actual working it is not. The printing only takes about a third of the time that is taken by a silver print; it takes about three minutes to get it squeegeed on to the final support, and, say, three to five minutes to develop. The after-processes of clearing and washing are done practically automatically, as they are left in the alum whilst the other prints are being developed. We shall find, however, that, by transferring our prints in the way described, we have reversed them; that is, what was on the right is now on the left, and any writing, such as an advertisement or the name of a house, public or private, will read backwards. To obviate this, after development the gelatine is again transferred on to a third support. For this purpose special supports are issued for the first transfer and special paper for the second.

In many instances, the reversal will not matter, unless the photographer has a very conscientious mind, but in others the reversal would not only be illegitimate, but also untruthful. I discussed this in my paper last year, so will not go further into the subject this

vening, except on the subject of portraits. I have seen it argued hat, in portraiture, reversal is allowed, because it makes no difference whether the sitter is looking to the right or the left. Certainly not, but it makes a great difference to the looks of a man whether he parts his hair on the right or the left side, and also as to which hand he uses to write with. The only way to obviate the difficulty is to take the negative on celluloid and print through the film. The amount of extra time and trouble taken in the double transfer is not much, but the drawback is that one is tied down to a particular surface and colour of support.

In double transfer the rough and tinted paper cannot be used, and only a glossy paper that is apt to curl up in drying into an unmanageable roll. The portrait I have shown exemplifies this to a certain extent, although it has been under pressure for a considerable time. Here is one that has not been under pressure, and, unless care is used in unrolling, the film will crack. And this question of the surface of the final support of the picture is the great charm of carbon printing. Any surface of paper and any tint may be used that the photographer may think suitable to his subject. The Autotype Company keep, ready prepared, two or three different examples of paper; but, should these not be suitable, it is a very simple matter to prepare one's own. I shall show you specimens of the Company's papers and prints in different colours, so that you may see the different effects to be got on the white and the tinted, the rough and the smooth papers.

One thing will be apparent to you all after a little experience, and that is, that the contrasts are considerably reduced on the tinted paper, and this gives us an extra advantage where our negatives vary much. A thin negative will give a much better result on the white and a hard negative on the tinted paper. Again, a negative too hard for P.O.P. will be about suitable for carbon, and if too hard in the white can be tried on the tinted paper. One of the peculiarities of carbon, which I have not so far referred to, will be found to have a great influence on the resulting proof. This peculiarity is known as the continuating action. After the light has once acted on the paper, the printing goes on of its own accord, so that, by leaving the tissue for some time between printing and development, we may allow for any under-printing. But, at the same time, it will be found that there will be a tendency to flatness in the resulting print, owing to the action taking place all over the surface; also the tissue must be kept as dry as possible, as damp very quickly renders the gelatine insoluble. Another requisite in printing is what is known as a safe edge. This is generally provided free of charge when using a printing frame the same size as the negative, as the rebate serves the purpose; but, if we use a frame larger than the negative, we must provide something in the place of the rebate to serve as a safe edge. I generally keep a sheet of glass, with the usual shape of the photographs marked out with lantern-slide binders, as this saves the trouble of manipulating each negative, but masks can be just as easily made of brown paper. If the print is to be finished off thus on paper without any mounting, care must be taken to get the opening perfectly square and rectangular, as the slightest piece out will effectually spoil the effect. If no safe edge is used, it will be found that the film will have a tendency to come away from the support. By slightly vignetting the picture, as it were, this defect is overcome, and the safe edge should therefore be fixed to the glass and not the film side of the negative.

Like some other photographic processes, the amount of exposure to light is the most difficult to gauge. Although by varying the temperature of the bath a certain amount of over or under-exposure can be compensated for, yet the amount is small, and it is better to err on the side of over-exposure. By the use of an actinometer, after a few trials, one gets a very fair idea of the amount of exposure needed, and after a time, by just looking through the negative, the number of tints required is correctly judged.

One thing I have noticed, that I have not seen mentioned in any paper on the subject, and that is, that the sepia tissue requires a longer exposure than the black, and probably all the different colours would require different exposures. I particularly noticed this on one occasion when I printed six black and six sepia prints, and found that all the black were hopelessly over-exposed, whilst the sepia, if anything, erred the other way. Should the *over*-exposure not appear hopeless, the best thing to do is to let the tissue soak in almost boiling water for some considerable time, when it will be found by the colour of the water that a fair amount of reduction has taken place. I cannot myself recommend the pouring of boiling water over the print, as I find it is very apt to cause blisters. Another point I might call your attention to, and that is, not to rub with the finger, or even touch, the film whilst in the hot water, as the mark is certain to show. Although the film is insoluble, it is still very tender, and cannot safely be touched until after the alum bath.

In regard to the drying of the proofs made by the single transfer process, no special care is required, but perhaps the most expeditious way is to hang them up by the corners. By the double transfer process the film is left till dry on the temporary support, and should come off of its own accord, but is then apt to curl to such an extent as to cause a fear of its cracking on being uncurled. The best way would be to paste backing cards on the prints whilst still wet, and then they should keep flat for trimming and mounting.

I do not know that I need say anything about the mounting, as that is a matter of taste, but I do not think that a white mount is suitable for a picture on yellow-tinted paper like the etching paper, unless there is a fair amount of tint round it; and the colour of the mount will have a great effect on the appearance of the print, as to over or under-exposure. A white mount will kill the high lights, and would therefore be of use for an under-exposed print, whilst a dark mount will kill the shadows and throw up the high lights, and so save what would otherwise be a spoilt print. For my part, I slash my photographs about in the most reckless manner, and often get simply a quarter-plate out of my $7\frac{1}{2} \times 5$ negatives, or else what one of the papers called, in our last Exhibition, a strip one inch by five of London fog. Another example, too, was in a snapshot I took on the Thames of a barge. This I enlarged from part of the quarter-plate to 15×12, and then from that made a $7\frac{1}{2} \times 5$ picture. I say picture, because, as it was admitted to the Salon, I feel justified in so calling it. A very good plan to find out the best part of a print is to have cut-out mounts of different-sized openings, and to move them about over the prints until the right piece is found. The picture just mentioned was so composed and had been put aside as a waster, having been very much over-exposed, bnt the use of the dark mount in this way immediately threw up the high lights, and the result was "a *picture*."

The plan I have adopted for testing the best tint of mount for my prints, and one which I can strongly recommend, is to have a printing frame some sizes larger than the picture to be judged, and by placing the trimmed print in this, with paper behind, a very good idea can be had of its appearance after framing and mounting. I use a 15×12 printing frame for my enlargement, and by using it in this way I decide whether a brown-paper, yellow strawboard, or white and Indian tint mount will best show up the desired effect. Of course, those of you who only use the ordinary white mounts with India tint will not need to take this trouble, but you have no idea of the advantages you are losing by so doing. I think I may safely say that not one print out of a dozen will look well on a white mount—a pure white, I mean.

Luckily for you, the pure white mount is not to be had of the ordinary photographic dealer, in fact I only know of one man who makes it. Place beside it one of the cheap India tinted mounts as sold by the ordinary dealer, and it will be found that the latter is distinctly grey. This is, as I have said, really an advantage, as far as the picture is concerned, but the disadvantage is that, when you order a white mount, you expect to get it. And this reminds me that our paper this evening is on carbon, and not on mounts, and that we do not always get what we expect in this delightful process. But, alas! sometimes we get considerably more than we expect.

LESLIE SELBY.

(To be continued.)

CHANGING THE STOP.

FROM time to time reference is made to the advantage of changing the stops during the exposure through a screen of a negative intended for half-tone work. Levy apparently makes a practice of doing so, and Dr. J. M. Eder has not only countenanced it but recommends it, and many, in fact most, of our best operators make it a universal operation in their practice, apparently thinking that, if a change is good in one instance, it must be in all. The writer believes that the value of such a change is at least debatable, and the regular practice of it certainly only an unnecessary complication of an otherwise none too simple matter. Writing from practical experience, in no case in which the gradation of the copy is satisfactory is it possible to produce a better result by the use of two stops as compared with one, while definition and sharpness of the dot is certainly more easily obtained with one stop than two. Make an exposure on a plain background, changing stops, and what is the result? Two dots of different sizes superimposed, the densest spot, of course, in the centre and a considerable vignetted halo. If intensification is resorted to, the halo still exists. Of course, it may be reduced by "cutting" with a reducer, but there will still remain a considerable vignette, and the result will be a negative from which to produce the best

result; the printing will be a matter of such a nicety that the average printer will scarcely attain to it. By using one stop only, the dot will be much more defined and an easier printing negative will result, that is, a negative allowing greater latitude in exposure. Take the case of a copy of satisfactory gradation, the change artist tells us he puts a small stop in to cut up the shadows; but, as the negative, if entirely exposed with such a stop, will be too "screeny," he changes it for a large stop to close the lights. Surely it is apparent that there is a mean stop somewhere between these two that will with one exposure do exactly what the other two will, so far as gradation is concerned, and do it much better, because of the gain in the crispness of the dot and avoidance of the risk of movement. The fewer factors one has to consider in process work or any other, the more likely is a desired result to be obtained. We will therefore consider the screen at an unvarying distance from the plate; that being allowed, it must be admitted that there is a certain amount of light action which will give just the strength of dot in the shadow together with just sufficient closing of the high lights, and that particular amount of light is much better admitted through one stop than two.

Any disproportionate exposure between the two stops will upset the gradation of the original, and, where the copy is good, there must follow a loss. To reiterate, *a single stop of the correct size* will give as perfect a rendering of an original as can be obtained by any possible combination of changes. The reader may place his finger upon the words, *a single stop of the correct size*, and ask the very pertinent question, What is the correct size? And to this question no exact or sufficient answer can be given. The strength and condition of the bath, the nature of the copy, the state of the mirror, and many other considerations will step in, and here the really intelligent operator displays his value in just keeping pace with such variations as he knows are bound to occur. It cannot be too strongly emphasised that there is but *one* exposure in conjunction with *one* stop, and one set of conditions, that will give all the gradation of a good copy when the plate is etched and printed. Let the negative fall short of such a standard by never so little, and, by no amount of after-dodging or what not, will the plate be an entirely satisfactory one.

It is the exact hitting of this standard that is the real difficulty of half-tone work. For instance, take a copy to be reproduced the same size. A certain stop produces an eminently satisfactory result in a given time, say 10 minutes. Now, if we have to reduce the same copy by one-third—the practical man knows the exposure will be less if he retains the same stop—don't retain the same stop, but so alter its aperture that the exposure will again be 10 minutes, and a negative identical in gradation with the first will result. Should an attempt be made to retain the same stop and equalise the exposure by reducing the time, the gradation will certainly not be the same. If a further reduction is desired, again so alter the stop that *proportionately* the same amount of light is admitted, and the exposure is again the same length of time, 10 minutes. The rule underlying this being understood and recognised, the stop may be selected with mathematical certainty. Of course, each variation in reduction needs a stop to match, and it would mean such a multiplicity of stops that a modification of the iris form is desirable.

Turning, again, to the question of changing in actual practice, some operators will make an exposure somewhat as follows, first inserting a stop equal to *f* 8, and expose 1 minute, and then replace it by *f*-16, and expose 4 minutes; total, 5 minutes.

Under these circumstances, the result produced by a stop of *f*-11⅓ with 4 minutes' exposure, will be identical, so far as gradation is concerned, with the attendant advantages previously mentioned.

Again, there are operators who appear to think that, if one change is an improvement, two must be better still, and they further complicate matters by using, say, *f* 8, and expose 1 minute, exchanging for *f*-11⅓, and expose 2 minutes, and again change for *f*-16, and expose 4 minutes; total, 7 minutes.

Again, the same gradation would be ensured by inserting *f*-11⅓ only, and exposing for 6 minutes.

At times it is desirable to set up an alteration in gradation as compared with the original; an under-exposed copy, or one harsh from bad lighting or improper development, may be considerably improved by cutting up the shadows, for which purpose the two-stop man would relatively curtail his exposure with the large stop, and lengthen that given through the small one, and the following would likely enough be his formula: *f*-8, and expose ½ a minute, *f*-22, and expose 8 minutes; total, 8½ minutes.

Here, again, the same end would be attained, the same cutting arrived at, by an exposure of 6 minutes through *f*-16.

On the other hand, to increase the contrast of a flat or over-exposed copy, the formula may be, *f*-8, and expose 1 minute, *f*-22, and expose 4 minutes.

A similar gain will be obtained by using *f*-11⅓ only, and exposing 3 minutes. What the writer urges is an elimination of all unnecessary factors in the production of half-tone negatives, uniformity, the production of which does so much to subdue subsequent difficulties, use an iris form of diaphragm, certainly not always of one shape, in the aperture. Divide your copies into three classes: first, good; second, hard—to be cut into; third, soft—to have the contrast increased. Have a special form of stop for each class. Work with your screen in one fixed position, and one exposure for each class. Do not change the stop during exposure, but so alter and proportion your stops that your negatives will receive the same actual exposure, and, if this be done, *uniform negatives will result*. The practical man only too fully realises the importance conveyed in the italicised words. It means, practically, an unskilled printer, and reduces fine etching almost to the vanishing point.

EDWIN C. MIDDLETON.

PHOTOLOGY.

SOME short time since, a writer in *Nature* deplored the want of a name to distinguish the photographic investigator from those who merely use photography for the production of pictures. The term, photographic investigator, is here meant to denote one who studies the principles upon which photography is based, with a view to the discovery of new processes and improved methods. He is not a photographer in the ordinary acceptation of the term, and he may even be utterly ignorant of the artistic side of picture-making. By his very training he has cultivated a matter-of-fact, scientific habit, rather than the imaginative, emotional temperament, which belongs more particularly to art. To him photography owes not only its very existence, but also its progressive development, notwithstanding the assertions so frequently made, that, for all practical purposes, photography was as efficient thirty years ago as it is now; and yet the English language contains no word which will adequately describe him, and at the same time distinguish him from the large army of workers who practise blindly, and perhaps even ignorantly, the various processes which he has elaborated at so much cost.

This state of things is fair neither to the investigator nor to the artist. Without attempting any invidious comparison of the relative merits of discoverers on the one hand and button-pressers on the other, it is a matter for regret that a simple defect in language should brand a photographic chemist and an art photographer with the same name, even although it may happen in certain cases that both the artistic and scientific faculties are combined in the same fortunate and gifted individual. But the invention of a new name is beset with peculiar difficulties but little inferior to the discovery of a new fact, and with this essential difference, that, whereas a new fact, once discovered, must be accepted as such, a new name is not established until it has run the gauntlet of adverse criticism and has finally been admitted into current literature by the force of universal custom. Many attempts have already been made, and, indeed, are being made at the present time, to force new words upon the photographic world, but in very few instances do these words succeed in holding their own against their older rivals.

In the present case, however, the task is simplified to this extent, that it is not a question of ousting an established word, but of supplying a word where none exists. With this object in view, perhaps a few suggestions may in some small degree help to smooth the way.

In the first place, it will be well to point out certain objections to some of the names which rise most obviously to mind, or which have already been suggested for supplying the want in question. The terms *art* and *science* are in themselves sufficiently distinctive. As we all used to learn in school, a science teaches us to know, and an art to do, and photography is at once both art and science. But there are few who would favour the introduction of such terms as *photo-artist* and *photo-scientist* to distinguish the ordinary photographer from the photographic discoverer. Not only are such compound terms objectionable from their inconvenience, but their hybrid derivation in the present case would be an insuperable philological objection to their adoption. It has been suggested that the term *photographer* might be retained to denote the scientific worker, while the mere picture-taker might be called either a *camerist* or a *luciscribe*. The first of these terms is perhaps worthy of some slight consideration, the second is an ugly synonym; but, if we consent to the use of the term *camerist*, we shall let in the thin end of the wedge, which will gradually necessitate a still further differentiation into ordinary camerists, and hand-camerists or kodakers.

We cannot afford, therefore, to alienate the term photographer from the use which universal custom has given it, nor does it appear, either on the grounds of philology or euphony, that any better word than photographer could be found for the whole band of followers of the art of picture-making by the action of light. A still further objection to the words above mentioned is the fact that they have no corresponding adjective, a point of the utmost importance in the choice of terms. The expression *photographic chemist* has, it is true, the corresponding adjective *photo-chemical*, but this term excludes altogether the investigator of the important laws governing the physics of photography.

It seems, therefore, that it is necessary to seek for a word which shall combine both the physics and the chemistry of light, if we wish adequately to denote the prosecution of photographic research. Light is the very essence of photography. Whether it be in the use and construction of lenses, or the chemical nature of sensitive compounds, light is the power which is primarily concerned. The laws of light, commonly called optics, are the laws of photography. But the word optics does not connote the chemical side of the question; it refers chiefly to the physical action of light. We require a word of more extended meaning which will denote the science of light in both its chemical and physical aspects. Both by analogy with other sciences, and also etymologically, that word should be *photology*, defined by Webster as the doctrine or science of light. The adoption of this term would solve every difficulty. The *photologist* would be the investigator of the action of light, the student of the physics and chemistry of photography, while the photographer would still be, as now, the user of the methods and processes which the photologist has discovered. Photology and photography would stand to one another in the same relation as science and art; picture-making would no longer be confounded with photo-chemistry, and greater harmony would prevail between these two very distinct branches of practical knowledge.

It is no argument against the use of the term *photology* that many of the investigations by which photography is advanced lie in the domain of pure chemistry. Every science, in its widest sense, must necessarily embrace others upon which it is dependent. The justification of a term must depend upon its broadest application rather than upon narrow limitations. Neither can it be urged that the word photology has already acquired a meaning incompatible with its use for the purpose here suggested. As a matter of fact, it is a word which has hitherto been used but little, if at all, and could therefore well be pressed into the service of photographic literature.

J. Vincent Elsden.

ROUGH-SURFACE PAPERS.

[Newcastle Photographic Association.]

The printing and toning of matt-surface papers, whilst opening up a large field for experiment and research, must of necessity be treated by me in a very brief manner, as the object of this little paper is more to show you some of the results which I have obtained in experimenting with matt papers, rough-surface and otherwise, than to deal with the manufacture of the paper. There are now so many excellent brands of matt papers on the market that I do not think any one will gain much, and they may lose a great deal, by endeavouring to sensitise their own paper. Perhaps it is sufficient for me to tell you that, roughly speaking, the process consists of sizing and salting plain paper with gelatine and chloride of sodium, and then sensitising with nitrate of silver. In the course of the manufacture of all sensitised papers, the amateur and professional alike has to contend with that great and persistent enemy of the photographer, dust; and, considering that you cannot possibly make it cheaper than you can buy it, the game is not worth the candle. There is not with matt papers the inducement, even to the professional, to sensitise his own paper. You all know of the advantage of using freshly prepared sensitised albumen paper, but there is this peculiarity about matt papers, and particularly so with the "Venus" and "Mezzotype" brands, that they actually seem to improve by keeping; and, even when the back of the paper has become very much discoloured, and the face of the paper shows signs of discolouration, you will be enabled to get a better result than with freshly made paper. I do not know why this is the case, but I myself, in common with those who have worked the paper, find it to be so. Therefore I would recommend you to buy your paper ready-sensitised, and when it shows signs of discolouration do not throw it away.

No one who has attended the numerous photographic Exhibitions held during the last two years can have failed to notice the immense increase in matt-surface prints; indeed, it is quite a rare thing now to see any glossy prints sent in for competition. This is very remarkable when you come to think of the enormous sale of gelatino-chloride papers. Only a few years ago there were very few, comparatively speaking, who manufactured gelatino-chloride papers. Now the name of manufacturers is legion. Let us for a moment consider why it is that men of experience and ability prefer to print from their negatives on matt papers, in preference to glossy papers. I take it that the object of the photographer in photographing a landscape is, as far as possible, after composing an artistic picture, to reproduce it in as artistic a manner as possible. Recollect that the photographer has only his negative, his printing process, and his brains to enter into competition with the painter, who also has the immense advantage of drawing upon his imagination. I hope you will all agree with me that it is quite possible to make pictures by photography. To my mind some of the photographs of our great masters are in every respect as beautiful and naturalistic as some of the paintings of the greatest artists. There is no doubt about it, and you cannot but admit it, that the public taste is still for the old highly glazed photographs. But I feel sure that the time is fast drawing near when all our best photographers will discard to a very great extent albumen and gelatine paper, and substitute in their stead carbon, platinum, or some of the other matt papers. Do not let me be misunderstood. The question of taste is entirely one of individual opinion, but I am led to this conclusion from the fact that many professionals who supply their clients with the glossy gelatine print will themselves send in for competition prints on matt paper, well knowing that they will be judged by men of ability, artistic taste, and experience. I think there is no possible comparison between the highly glazed surface of one print, compared with the delicate soft surface of a carbon or platinotype, or some of the other matt papers, giving the appearance of an etching. I have lately had two carbon prints, one in blue carbon, representing a sunset, and another in brown carbon, of a nest of eggs, and it has surprised me to find how many people have thought that these were paintings and not photographs. Had they been printed on ordinary glossy papers, any one could have distinguished them. Like everything else, it takes time and keen observation, with an earnest desire to aim high and produce the best work, to effect a change from the old groove, but with this aim in view, with association with your superiors in the art, with a study of their great triumphs commences your art education, and this studiously followed up enables you to appreciate and admire the beauty and artistic nature of their productions and stimulates you with a desire to go and do likewise. And here I think I ought to pay a high tribute of gratitude to our worthy President Mr. Gibson, and other leaders in photography. These men with noble generosity make no secret of their processes, but are at all times willing and anxious to take the young amateur by the hand and lead him safely over the rocky ground, to finally land him on the road to fame.

Leaving now altogether the artistic side of the question, which you must decide for yourselves, I pass to the more important and practical side of my paper, and shall deal with the treatment of matt papers, speaking briefly upon Venus paper and Mezzotype paper, and merely mentioning gelatino-chloride, collodio-chloride, carbon, and platinotype. Of gelatino-chloride and collodio-chloride I shall say nothing, as it is only a few months ago since Mr. Park and myself told you about all we knew on the subject. I would just like to remark that, although very beautiful results are obtained on these papers, the surface is too smooth for large negatives. Platinotype I would prefer to leave for another occasion, believing that there is ample material for another night. Carbon printing, the most beautiful and the most permanent of all our processes, I have only worked but slightly, and am looking forward to one of our carbon workers in the Society giving us a paper on the subject. At any rate I do not feel, without further experiment, qualified to speak to you on the subject. What I have done convinces me that some of the most artistic effects can be produced on that paper. To-night I wish to introduce to your notice two of the finest printing papers that I know of —Venus paper and Mezzotype paper. In these papers you have, I think, the nearest approach to perfection in art papers that you possibly can have, that is, for pictures whole-plate size and upwards. I would not recommend you to print on the rough paper with anything under a whole-plate negative. It is obtainable in several degrees of roughness, which enables you to select that most suitable for your negative. Let me at once say that, for regularity of tone and ease in working, I prefer the Venus paper over the Mezzotype, but I submit you samples of both and leave you to form your own conclusions. Let us then consider the class of negative suitable for the matt papers. It is useless to try and get good results from under-exposed negatives, such as many instantaneous negatives are. The best results are got from a negative which has been fully exposed, and, if possible, with fairly strong contrasts. The class of negative which will give you a good platinotype suits these matt papers admirably. Very good results indeed, however, can be obtained from soft negatives full of detail, and which are so suitable for bromide enlarging. If you have a weak negative, print in subdued light, and through a piece of ground glass. With a suitable negative, however, print in the best possible light, even in sunlight. Print until the shadows begin to darken. A little practice will soon let you know just when to stop. And here let me mention that the proper printing of a negative is everything for the finished result. If you under-print, you will find that the fixing bath will, as it were, completely bleach away your tone, leaving you a very sickly print. On the other hand, if properly printed, whilst slightly reducing the print, the colour will come again on drying. You are all possibly aware that a strong fixing bath and long fixation will materially reduce an over-printed print; but, in the case of these matt papers—and this applies to them all—a strong

fixing bath is not admissible, as it altogether alters the tone of the print from the beautiful sepia to an unpleasant black.

Many who have tried these papers have given them up in desperation, not because they have failed to produce good and beautiful tones, but because, after drying, the paper is found to have double tones, and to be altogether different to that first produced in the fixing bath. I will endeavour to show you how you get these double tones, and how you may avoid them. It is the old story of perfect *versus* imperfect washing, and perfect *versus* imperfect fixation. Unless you wash thoroughly in running water for quite half an hour before toning, you can expect to get double tones. Particularly is this the case with the rougher and thicker papers, which are so thick that, unless the paper becomes thoroughly soaked, the the toning will act very irregularly. This is one reason of double tones—when one part of the print is toned, the other is not. Therefore please remember a thorough washing is absolutely necessary. Secondly, the strength of the toning bath must be not greater than half the ordinary strength, slow toning being an absolute necessity. If you tone with a strong bath, it tones, as it were, only half the surface of the print, and this in the fixing bath disappears, leaving you quite a different result to that anticipated. After toning again, wash well for about five minutes, and then transfer to a fixing bath of hypo two ounces, water twenty ounces—just half the ordinary strength—for fifteen minutes, constantly moving the prints about, and then put them into another bath of the same strength and and for the same length of time. Thorough fixation is most important, otherwise you will get double tones. After fixing, wash well for four to six hours in running water, and then dry. The tone desired must to a large extent depend upon the subject. With some a warm sepia brown is desirable, whilst with others a darker and colder tone would be preferable. This must, of course, be left to the individual worker.

And now as to toning baths. Any of the ordinary gold toning baths may be used, and some of the finest tones I have got are from a plain gold bath, neutralised with common chalk. Platinum in in the form of chloroplatinite is also largely used, and acts splendidly, though great care is necessary, it being very energetic. A mixture of platinum and gold acts very well indeed if used the same day as mixed; but it will not keep. Beautiful results, perhaps the most beautiful, and certainly the most satisfactory, can be obtained with the combined toning and fixing bath, taking care to refix for half an hour in a weak fixing bath. I do not intend to enter into the old and vexed question of permanence, believing, as I firmly do, that, if the prints are properly fixed in a separate bath, they are as permanent as those toned and fixed separately. The treatment of all matt papers is the same, and it would be but repeating myself to go into them. I will just ask you to remember that the great thing is to wash and fix properly, and use a weak toning bath.

J. Watson.

SOME FACTS ABOUT GLASS.

[Scientific American.]

The most scientific glass workers of to-day are no more proficient in their art than were the craftsmen of ancient Thebes, 4000 years ago. These remarkable artisans, many of whom were priests high in authority, were well acquainted with glass staining, and displayed the highest artistic skill in their tints and designs. The colours were perfectly incorporated with the structure of the vitrified substance, and were equally clear on both sides. The priests of Ptah, at Memphis, had a factory for the manufacture of ordinary glass, and also devoted their attention to imitating precious stones, succeeding so well, that specimens now found require an expert to distinguish them from the real gems. They were also acquainted with the use of the diamond for cutting glass. A specimen of beautifully stained glass, now in the British Museum, has the cognisance of Thothmes III. engraved upon it.

Spun glass was first brought into practical use about fifty years ago by Jules de Brunfaut, a French chemist, although the art of spinning glass was practised long before that time. He made a thorough study of the subject in Vienna. He first succeeded in softening the hard, shiny effect of the glass fabric, giving it a silky effect that was much more pleasing. Next he endeavoured to reduce its brittleness by making a spun glass, whose threads were much finer than those of silk, and whose texture was much like that of wool. This glass could readily be woven, and all kinds of articles were made of it. Among other things it was found especially suitable for surgical use, owing to its antiseptic properties and its cleanliness. The fact that glass is unattacked by most acids made the fabric useful for laboratory filters, and nearly all well-equipped establishments of the kind now use them. The cloth is, besides, non-combustible and a poor conductor of heat. As the individual fibres are perfectly non-absorbent, grease spots and stains can be readily removed. For this same reason the cloth cannot be dyed, but it can be spun of coloured glass, and the colour is absolutely fast and unchanging.

Up to the beginning of the sixteenth century the glass used in stained-glass work was what is known as "pot metal," that is, it was coloured in mass through its entire substance. Painting was only used to bring out the shading and fine line work, and the paint was always brown, which was afterwards "fired" into glass. During the sixteenth century a rich yellow stain, obtained by the use of silver salts, came into use. It was also used upon blue glass to produce green effects. Shortly afterward the irregular depths of tint in the glass were first utilised to give modelling. The ruby glass used at this time was made by placing a thin layer of ruby "pot metal" upon the surface of a sheet of white glass and welding the two together by heat, as the ruby alone became opaque as soon as any thickness was reached. It soon occurred to some one to cut or grind away the ruby surface to produce white figures on the red ground. By staining the exposed portions, they were also able to get rich yellow and red contrasts. This led to extending the practice to other coloured "pot metals," until a great variety of beautiful effects were produced.

When glass contains little or no lime, it shows a marked tendency to become opaque upon cooling, probably owing to minute crystallisation throughout its structure. The so-called alabaster glass is made by re heating glass of this kind and allowing it to cool slowly. Opalescent glass is that which possesses the same tendency in less degree. A good "mix," as it is called by glass-workers, for alabaster glass is 100 parts of quartz sand, 45 parts of potash, 3 parts of calcined borax, and 5 parts of silicate of magnesia.

Our Editorial Table.

St. Paul's Cathedral.

Sixteen Views by Freeman Dovaston. London: Charles Taylor, 23, Warwick-lane.

Comparatively few Londoners know what a really majestic and beautiful cathedral is St. Paul's. With its outward aspect, of course, every one is familiar, and in this album of views Mr. Freeman Dovaston, unquestionably a skilful photographer, shows us the inside of the cathedral—notably such features as the nave, font, the chapel, monuments, the choir, the decorations, and other parts of the great fane. The views have been well selected and are nicely reproduced in half-tone, the descriptive notes being by the Rev. W. Sparrow Simpson, D.D. The album deserves to be popular.

A Treatise on Photogravure.

By Herbert Denison, F.R.P.S.: London Iliffe & Son.

We have watched with interest the growth in popularity, during the last three years of the photogravure process, especially among amateurs. This is largely due to the efforts of Mr. Herbert Denison, who by his lectures and exhibits has materially helped forward the movement. The present volume is one of which he may be proud. It is an exhaustive exposition of the Talbot-Klic process, which is described step by step with a fulness and detail such as any individual, presupposed by the author, having a knowledge of negative-making, could not fail to grasp and profit by. As contrasting English and American ideas it may be interesting to note that Mr. Denison (whose own practical work well backs up his theory) in opposition to a recent American writer whose monograph on the same subject we lately noticed here, strongly recommends the carbon process, as against gelatine and other methods, for the production of the transparency. Mr. Denison is a safe guide, and his book is a careful and conscientious production. But a fuller index would have been handy for reference. There are several illustrations (one of a photogravure in line, to which department a chapter is devoted) and some historical notes by Mr. Bolas.

Mr. J. H. Steward, of 406, Strand, W.C., forwards us his catalogue (part 5) of optical lantern and dissolving-view apparatus, &c. The firm's latest novelties in connexion with the lantern are illustrated and described and, as usual with this old-established house, in great variety.

The "Three Swans" Collodio-Chloride Paper.

J. R. Gotz, 215, Shaftesbury-avenue.

Mr. J. R. Gotz has sent us samples of the "Three Swans," matt and glossy, collodio-chloride paper for trial. Both papers give admirable results, a feature being that any toning bath may be used with them; but here are two formulæ recommended by the makers:

For Blue-black Tones.

In forty ounces of water (distilled) dissolve:—

A.

Acetate of soda	15 drachms.
Sodium chloride (table salt)	2½ „

B.

Water (distilled)	20 ounces.
Sulphocyanide of ammonia	2 „

Both solutions will keep. One to two hours before toning mix, say, 0 ounces of A with one of B; add 1 ounce gold chloride solution, one per cent. strong.

FIXING BEFORE TONING.

Greenish blue Tones for Foliage and Seascapes.

Water (distilled)	40 ounces.
Sulphocyanide of potassium	9 drachms.
Sodium chloride	2½ „

To 20 ounces of this bath add 1 ounce gold solution one per cent. strong.

MESSRS. TAYLOR, TAYLOR, & HOBSON, of Leicester, send us a copy of their new lens catalogue, fourteenth edition, which contains for the first time particulars of the Cooke Lenses, Series III., a hand-camera lens, and the Standard Dust Caps for covering the back glasses of lenses. The appendix, which is a permanently useful part of the list, has been largely rewritten, and particularly the parts which treat of Astigmatism, Depth of Focus, Curvature of Field, and Intensity or Rapidity.

News and Notes.

CAPTAIN ABNEY has removed from 1, Wetherby-place, to Rathmore Lodge, Bolton Gardens South, S.W.

CROYDON ART SOCIETY.—At a meeting, held on the 6th instant, Mr. Hector Maclean, F.R.P.S., was elected Vice-President of the Society.

THE Moonlight Patent Lamp Company, of Liverpool, write: "We have much pleasure in informing you that we have been awarded a gold medal and diploma for the 'Moonlight' vapour lamps at the Belfast Industrial Exhibition."

BLAIRGOWRIE AND DISTRICT PHOTOGRAPHIC ASSOCIATION.—This Association will hold an Exhibition of photographic work in the Public Hall, Blairgowrie, on Wednesday, Thursday, and Friday, December 18, 19, and 20, 1895. Full details will be announced in due course. The address of the Hon. Secretary is, Mr. T. C. Gorrie, Blairgowrie.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, November 27, Lantern Night. Subject, *The Shrewsbury Convention*, by Mr. Secretary Drage. Members having Convention slides will please oblige by bringing them to the meeting. Visitors are always welcomed by the members.

THE following advertisement recently appeared in a trade journal:—"RARE CHANCE.—Illness.—A Missionary must sell his splendid lantern outfit and 200 special slides for preaching 'Cross of Christ' and 'Soul-winning,' original designs; most effective for conversion ever designed, price 30*l.*, easy terms arranged; cost 55*l.*; up to date, as new; bargain rarely met with.—Missionary," &c. Well may this miraculous instrument of conversion be termed a "magic lantern." I should not myself, however, attach much importance to conversion wrought by this agency.—*Truth.*

THE NUDE IN PHOTO-MECHANICAL WORK.—Our disapproval of the practice of some process engravers to publish nude women in vulgar poses in their circulars seems to meet with a similar rebuke on many sides. One publisher tells us he will not trade with such engravers. It is even noticed on the other side of the Atlantic. *Process Work* says: "Americans have a weakness for the portrayal of the nude in art in the selection of half-tone cuts. Of some of the subjects, the remark applied to the statues in the Paris opera would fit very well—that they are very nice, but would be no worse if they displayed a little more linen." The leading editorial, in a recent number of the *Engraver and Printer*, was on the same subject, in which a subscriber writes that he thought of quitting his subscriptions on account of "the lewd pictures that were allowed" in the photo-engravers' ads. *Verb. sap.—Anthony's Bulletin.*

THE Hackney Photographic Society's Exhibition was opened on Tuesday night at Morley Hall, Hackney, by the Earl of Crawford, who, as he explained in a brief address, had devoted himself for many years to the scientific side of photography. Often of late has the question been asked whether a person practising that pursuit is entitled to call himself an artist, and on this subject his Lordship seemed to think that, although people who dabbled to a certain extent in chemistry might develop artistic tendencies, it did not follow that a person who could produce a picture by means of the camera must necessarily be an artist. In the Exhibition before him he was glad to see nothing of the system of over-retouching, by means of which portraits were very often so idealised that they bore no trace of resemblance to the sitter. He considered the process detrimental both to the science and practice of photography. At the instance of Mr. E. J. Wall, President of the Society, the Earl of Crawford was heartly thanked for his presence. We defer our notice of the Exhibition till next week.

ROYAL PHOTOGRAPHIC SOCIETY.—Technical Meeting, Tuesday, November 26, at eight p.m., at 12, Hanover-square, *Photo-ceramics*. A demonstration will be given by Mr. W. Ethelbert Henry, C.E. *A Method of Carbon Printing without Transfer*, by Mr. Valentine Blanchard.

SENSE OF COLOUR IN ANIMALS.—It is next to impossible to cite an instance in which a dog identifies an object by its hue, and there is little positive evidence that the larger quadrupeds have much sense of colour. Domestic cattle are so far affected by violent contrasts of white and dark that the presence of a black, white, or very clearly spotted animal in the herd sometimes results in calves being thrown of the same colour or markings. But, though red is said to irritate a bull, and to excite hunters by association of ideas, the latter statement rests partly on surmise. The writer has seen a setter refuse to retrieve a black rabbit because it apparently thought its master had shot a black cat. But a house-living dog shows no preference for a red carpet or rug over a blue or variegated one, and expresses no surprise or curiosity whether its master wears a red uniform or a black evening suit. None of the cats, whether wild or tame, show any partiality for bright hues; and, among all the stratagems used from time immemorial by hunters, the use of colour as a lure for quadrupeds is notably absent.—*Popular Science.*

SLOW LIGHTNING.—Mr. Robert Bridges writes to *Nature*: "As far as I know, the first description of slow lightning occurs in your issue of November 7. It must be very rare, for I have never met any one who would readily believe in its existence. I write to testify to the accuracy of Mr. Crawford's description, though I have not seen it quite as slow as the flash which he timed. The best example that I ever saw was in a storm over London some eighteen years ago. A thick stream poured down, in the sort of curve which liquid takes from a kettle, and was then slowly joined by a similar stream from the opposite direction, the united stream then continuing its slow course downwards. I was not where I could see the end of it. The peculiarities—the breadth of the streams, and their deliberate motion—could scarcely be an optical delusion. The streams did not appear to me as 'chains.' I have observed lightning all my life, and since it has begun to be photographed I have been looking out for pictures of the various types. I hope we may get some picture of this, and also of the sheaf form, which I have seen in storms directly overhead, the flash being like two brushes discharging in opposite directions, recalling the classical representations of the lightning in the hand of Jupiter."

CONSIDERABLE irritation is felt by a large number of people in a village near Holywell at what appears to have been a fraudulent trick. At the beginning of September a couple of fashionably dressed gentlemen "from Liverpool" visited the village, and gave out that they were on a tour through Wales compiling a pictorial directory, which would be of service to the numerous English visitors who annually spend their summer vacations in the Principality. They desired to take photographs of the picturesque and quaint-looking houses in the village for insertion in their directory, and, as a favour, they promised they would send copies of the respective photographs, if the owners wished, for the modest sum of 18*s.* per dozen, paid in advance. Many of the villagers put on their best clothes and "looked pleasant" while the snap-shot was taken. In each case the artist stated that the operation had been successful and a good plate obtained. The photographs were to be sent to the villagers in the course of a few days. Weeks passed by, until one person, more suspicious than the others, sent to inquire. A reply from the Liverpool Post-office came back, "Not known; no such firm." The people who were photographed have by this lost the power to "look pleasant" under the circumstances.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 21,366.—"Improvement in Screens for Photo-mechanical Processes." Complete specification. E. G. D. DEVILLE.—*Dated November*, 1895.

No. 21,465.—"Improvements in Photographic Cameras." T. ROCHE.—*Dated November*, 1895.

No. 21,753.—"Improvements in Photographic Dark Slides and Change Boxes." A. C. SMITH and J. STUART.—*Dated November*, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange Ross's rapid symmetrical half-plate, and Lancaster's half-plate combination rectigraph, for whole-plate outfit.—Address, J. W. H., Cornfield Villa, Todmorden, Yorks.

Will exchange Burr's cabinet portrait lens, about seven-inch focus, cost six guineas, for a lantern with six-inch condensers, fitted for oil, with slides.—Address, BOWMAN, Photographer, 31, Wesley-ave, Mutley, Plymouth, Devon.

Wanted, Victoria lenses. Would exchange Rhumkorff electric coil and battery, small dynamo, and three mahogany half-plate slides, fits Lancaster's or Underwood's Instanto.—Address, THOS. L. MCCANN, 24, Kirkpatric-street, Glasgow.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

November.	Name of Society.	Subject.
25	Camera Club	*Daylight Enlarging.* F. Seyton Scott.
25	Lantern Society	
25	North Middlesex	
25	Oxford Camera Club	*Modern Hand Camera.* F. O. Bynoe.
25	Richmond	*The Uses of Eastman's Platino-bromide Paper.* N. Luboshez. Demonstration of the "Photo-Auto-copyist." John Taylor.
26	Birmingham Photo. Society	Private Exhibition of Members' Enlargements.
26	Bournemouth	*Some Lessons from the Two Photographic Exhibitions.* W. Thomas.
26	Brixton and Clapham	
26	Hackney	
26	Halifax Camera Club	
26	Lancaster	
26	Leith	
26	Newcastle-on-Tyne & N. Counties	*Platino-bromide, and a Talk on Successful Portraiture.* N. Luboshez.
26	Paisley	
26	Royal Photographic Society	*Photo-ceramics.* W. Ethelbert Henry, C.E.—*A Method of Carbon Printing without Transfer.* Valentine Blanchard.
26	Warrington	
27	Bath	
27	Burnley	
27	Croydon Camera Club	*The Improvement of Negatives after Development.* Mr. Jenkins. Annual *Soirée* and Exhibition of Photographs and Lantern Slides.
27	Croydon Microscopical	
27	Leytonstone	
27	Newton Heath	Social Meeting.
27	Photographic Club	*The Shrewsbury Convention.*
27	Southport	
27	Stockport	
28	Bradford	*Elementary Photographic Optics.* C. C. Vevers.
28	Camera Club	*The Value of a Line.* Henry Blackburn.
28	Glossop Dale	
28	Halifax Photo. Club	
28	Hull	
28	Ireland	
28	Liverpool Amateur	*The Lake District.* F. Anyon.
28	London and Provincial	Lantern Night.
28	Oldham	
28	West London	
29	Cardiff	
29	Croydon Microscopical	Conversational Meeting.
29	Holborn	
29	Maidstone	
29	Plymouth	*Carbon Printing.* W. H. Harris.
29	Swansea	
30	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 19,—Photo-mechanical Meeting,—Mr. H. Snowden Ward in the chair.

The business before the meeting was the discussion of Professor Burton's paper, *On the Formation of the Dots of the Half-tone Screen Image* [*ante*, page 651], and the proceedings were opened by

Mr. W. GAMBLE, who exhibited slides illustrating Professor Burton's statement that "it should be borne in mind that the dots produced by light penetrating the screen correspond not to the small black dots seen in the high lights of the finished prints, but to the small white dots seen in the darker parts." Other slides showed the graduated dot actually produced on the negative, the penumbral fringe being removed by subsequent clearing, Mr. Gamble contending that the graduated dot was far from being an advantage, as the result on the zinc was very ragged and dirty-looking. It was also shown that the dot was not of equal density, that a sharp edge could be produced by reduction and intensification, that the dot was a pinhole image of the diaphragm, that it was possible to get absolute sharpness in the camera even though the screen were not in perfect contact, and other slides exhibited the effect of diffraction, &c. Mr. Gamble passed round prints by Mr. Max Levy, showing that, the greater the distance of the screen, the greater would be the effect of diffraction. He was of opinion that the ragged edges of the dots were due partly to penumbral action and partly to diffraction. With a coarse line screen it was due entirely to penumbral action, but with screens of 133 lines to the inch and upwards the effect of diffraction was noticeable.

Mr. LEON WARNERKE showed slides, with a view to proving that the ragged edges were caused by interference, followed by diffraction, and not by coarseness of emulsion, as had sometimes been said; and he stated that the use of a crossed diaphragm rendered it possible to reproduce a screen in the camera with sharp lines and sharp corners. He asked what method of clearing and intensification Mr. Gamble adopted for dry plates?

Mr. GAMBLE said he had made a good many experiments, but had been unable to improve upon the old system of clearing with ferridcyanide and hypo, and afterwards intensifying with bichloride of mercury and ammonia, although he had got very good results by the use of Belitski's reducer, followed by intensification with pyro, citric acid, and silver.

Mr. WARNERKE said the straggling dots were an advantage in his process with silver salts, for they prevented the formation of the "mushroom," and were practically removed in etching.

The HON. SECRETARY (Mr. Chapman Jones) said that a greater amount of intensification resulted from the use of Monckhoven's intensifier, but the permanence of plates so treated could not be relied upon, and the same remar would probably apply with regard to the mercury and ammonia method.

Mr. GAMBLE had tried Monckhoven's intensifier, but it did not give hi entire satisfaction.

Mr. W. J. HOLT had been unable to get sharp lines or sufficient densit with dry plates, but

Mr. W. ENGLAND showed a block made from a dry plate by a large firm who had given up the wet-plate process.

A conversation ensued as to the cause of the appearance of "devils," in th course of which

Mr. H. WILMER said he thought they could not be attributed to any on cause. A method lately published by Mr. Huson would, no doubt, preven them in some cases. He suggested that they might arise in consequence o differential action of the etching solution.

Mr. WARNERKE had, on one occasion, traced "devils" to the presence of minute particles of rust on the copper plate.

Mr. GAMBLE mentioned an instance of the appearance of "devils" on a zinc plate coated with fish-glue.

The HON. SECRETARY suggested that the use of a dilute etching solution for several days on a copper plate would show whether there was any differential action.

Captain L. COLLARDON had been unable to get a hole on a copper plate, but the trouble always began when the carbon tissue was transferred on to it, and he had never had "devils" with Mr. Warnerke's process or with fish-glue.

Mr. JAMES suggested that the pigment in the carbon tissue might have something to do with it.

The HON. SECRETARY thought the operation of squeegeeing might cause defects in the tissue.

The CHAIRMAN said several of the suggestions with regard to "devils" could be easily put to the proof, and he hoped they would lead to investigation.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 14,—Mr. R. P. Drage in the chair.

The CHAIRMAN said he was very grieved to announce the death of Mr. John Traill Taylor, one of the most highly esteemed members of the Association, after a short illness, while on a visit to Florida.

Mr. A. HADDON, in proposing that a letter of condolence be conveyed to the family of Mr. Taylor, believed that every member of the London and Provincial Photographic Association would feel he had sustained a great loss. Although not one of the earliest members of the Association, yet, during the time he had been connected with it, he had been a great help, and was always ready to assist them when required. By his death was practically lost one of the stars of the first magnitude in photography.

Mr. W. E. DEBENHAM seconded the proposition, and expressed his sincere regret at the death of an old and intimate friend. He endorsed all the remarks of both the Chairman and Mr. Haddon.

The HON. SECRETARY read a letter from Mr. A. L. Henderson received by him, testifying to the high position held by Mr. Taylor, and said he felt he had lost one of his warmest friends, a man who has stood in the photographic world second to none.

Mr. T. BEDDING spoke of his long and intimate association with Mr. Taylor, whom he regarded with the highest feelings of esteem. He thought that as long as photography lived all would revere the name of John Traill Taylor.

The proposition was carried unanimously.

Mr. Arthur J. Banks was duly elected a member of the Association, and a proposal in the name of Mr. Arthur Hands was read.

The HON. SECRETARY read a note, sent on behalf of Mr. W. H. Harrison, referring to his continued absence from the meetings on account of his long illness.

A number of circulars were distributed relating to Mr. James Cole's new patent flexible rising and falling front camera.

The Chairman had had an opportunity of seeing the apparatus at Shrewsbury, and considered it very convenient.

A long discussion ensued on the definition of the point of sight in a picture, in which the HON. SECRETARY contended that it need not necessarily be near the centre of the picture at all, and instanced a picture of Alma Tadema's, in which it appeared in the top left corner. He defined the point of sight as that point in the picture immediately opposite the eyes, and explained his method of deciding the position of the same.

Explanations by Mr. DEBENHAM and others followed, but Mr. BEDDING said that no photographic lens could take such a picture as described by the Hon. Secretary.

The Hon. Secretary passed round three photographs of the procession of the Lord Mayor taken with a Steinheil lens.

Mr. W. D. WELFORD said that, at a recent meeting of another Society, a certain bromide paper had been put forward as not being liable to alteration whether damped or developed dry, and that no effect would be obtained by damping previous to development. He asked if, in the opinion of those present, he was not right in saying that, by damping the exposed paper before putting in the developing bath, the result was softened.

The CHAIRMAN thought it practically the same as diluting the developer.

Mr. W. E. DEBENHAM thought it probable that Mr. Welford was right, and that one would get a softer image by previous damping. He referred to some experiments shown by Mr. Sterry, in which part of a plate had been soaked in water before development. On developing, it was found that the last exposed portions of the wet part came up much quicker than those in the dry. Mr. Debenham thought, if it were true with plates, it was true with paper.

Mr. TEAPE confirmed Mr. Debenham's view as to development. He used to use bromide paper both ways for enlarging, wet and dry, and he found that wetting it first before exposure tended to soften the result.

Mr. BECKETT asked whether the wetting of the paper altered the sensitiveness of the paper?

Mr. TEAPE thought it might slightly.

Mr. GRUNDY considered it was more the effect of local dilution at the place of development.

PHOTOGRAPHIC CLUB.

NOVEMBER 13,—Mr. Newell in the chair.

About forty members were present.

The minutes of the last meeting, which was the General Annual Meeting, were confirmed after some discussion, when Mr. FOXLEE asked the attention of members for a few minutes whilst he mentioned the severe loss that the Club in particular, and the photographic world in general, had suffered by the sudden death of Mr. J. Traill Taylor. Mr. Taylor and he had been on terms of intimate friendship for more than thirty years. He thought that he first met his old friend at a dinner given to Mr. Geo. Shadbolt when he ceased to occupy the editorial chair of THE BRITISH JOURNAL OF PHOTOGRAPHY, Mr. Taylor succeeding him. During those many succeeding years he only knew him as a kind-hearted and generous man, unequalled in his acquaintance with photography and things photographic. No words of his need be added. He moved that the Photographic Club, through its Hon. Secretary, send a note of condolence to Miss Taylor, expressing the members' regret and sympathy with her on her bereavement.

Mr. E. J. WALL asked to be allowed to second the motion. As a brother journalist, he had the greatest respect and friendship for Mr. Taylor. He had only known him a comparatively few years, but long enough to know that the words of eulogy uttered by Mr. Foxlee were true and sincere, and he echoed them in their entirety.

Mr. FRANK HAES asked the indulgence of the meeting to allow him to add a word of personal tribute to Mr. Taylor's character. He (Mr. Haes) had known the late editor of THE BRITISH JOURNAL OF PHOTOGRAPHY for a period of upwards of thirty-three years. Never had he met a more staunch friend to photographers generally. If Mr. Taylor had one characteristic more strongly developed than another, it was that he was always eager to help such as were in search of photographic knowledge, or who sought to avoid the difficulties of a new process. His acquaintance with every branch of the art was unique.

Mr. THOS. BEDDING said that it would be only a few words that he should add to the tribute of friendship already passed upon his old chief. He was a peculiarly intimate acquaintance with Mr. Taylor. For ten years he had worked under him, and for five years he had been privileged to work by his side. No greater advantage ever befel a young man entering a difficult profession, and he felt bound to add that he felt it to have been the epoch of his life to have served under the chieftainship of his lamented friend. It would be his lot to follow—unworthily, he knew—in the chair which Mr. Taylor had so illustriously filled. and his example should be ever before him. There was one side of his late chief's character which had been but briefly alluded to, and that was his practical sympathy with photographers. He would venture to state that there were dozens of photographers now happily comfortably off who owed something, if not all, to the kindly disposition of him whom they would meet here no more.

The vote of condolence was carried by silent assent, and the meeting passed to the ordinary business of the evening.

Mr. E. J. Wall then dealt with the practical side of spectroscopic testing of glasses for photographic work. Having described his methods, which involved the use of a table spectroscope with three prisms, he dealt with samples of glasses and fabrics, and showed coloured spectrum diagrams of their qualities. A sample supplied by Messrs. Adams & Co. he described as of a particularly perfect and safe character for development; other samples manufactured by Mr. Carl Guitman, whose representative was present, were also spoken well of. A sample supplied from another source was condemned, as were the woven fabrics, although several members said that, in practice, these fabrics worked efficiently and safely. Mr. Wall pointed out that "safety" was a relative term—that, as a matter of fact, there was no safe light, and he particularly drew attention to the fact, for such he emphatically stated it to be, that even non-colour sensitive plates were sensitive to red and yellow light if exposed for a sufficiently long time to its influences. He recommended a pot-metal glass rather than a flashed one. Mr. Wall's remarks were characterised by great practical utility.

Mr. DAVENPORT next explained his new patent curtain carrier for optcial lanterns. This is an ingenious arrangement, by which a "curtain" is incorporated with the push-through carrier, the cost of the whole apparatus being two shillings and sixpence. Mr. Davenport showed his device, which possesses several important advantages in the lantern, and the carrier and curtain worked in a very satisfactory manner.

MANCHESTER PHOTOGRAPHIC SOCIETY.

NOVEMBER 14,—Mr. T. Chilton in the chair.

Mr. A. Brown was elected a member.

Mr. A. Brothers exhibited a number of process prints in two colours, red and blue, which did not exactly coincide, but, when viewed by the aid of an eyepiece of red and blue glasses, stereoscopic effect was obtained. Mr. Brothers also exhibited McKellen's latest hand camera, the features of which are a magazine and simple changing.

The Chairman then called upon Mr. Harry Wade for his paper and demonstration on *Carbon Printing*.

Mr. WADE, in a slight introduction, mentioned that the process of carbon printing was by no means of recent origin, being made workable in the year 1862 by Mr. J. W. Swan, of Newcastle, and at the present time we have the process in its simplest form. The various actinometers were shown and described. The negative most suitable for carbon printing is one rather plucky; one which prints well in platinotype is also suited for this process. The question of the continuing action of light was also gone into. The two processes of carbon printing, single and double transfer, were described at length. Mr. Wade then proceeded with the demonstration, developing various coloured tissues by Messrs. Elliott & Sons on single transfer paper, the paper used being smooth, rough, and tinted. The double transfer process was also demonstrated. Prints were developed upon temporary supports of plate glass, flashed opal, and ground opal, the plates being previously waxed and coated with collodion. Transparency tissue was also developed on to plain glass and collodionised glass, also glass coated with bichromate of potash and gelatine.

Messrs. Elliott & Sons kindly sent down for inspection specimens of work on their tissue, both enlargements and contact prints, which were much admired by the members.

There was afterwards a short exhibition of slides by Messrs. A. E. Casson and S. L. Coulthurst.

Brixton and Clapham Camera Club —A VISIT TO BRIN'S OXYGEN WORKS.—By invitation of the Company some twenty members of the Brixton and Clapham Camera Club paid a visit on Friday evening, November 8, to Brin's Oxygen Works, Horseferry-road, Westminster, and were conducted over the premises by Mr. Kenneth S. Murray, the manager, who explained the various points of interest connected with the production of oxygen by their system. Atmospheric air is forced by a pump, under a pressure of ten pounds per square inch, into two purifiers, one containing quicklime and the other caustic soda. The carbonic acid and moisture are thus abstracted, and the purified air is passed through a series of retorts, charged with barium monoxide heated to a temperature of about 1350° Fahr. Part of the oxygen contained in the air is absorbed by the barium monoxide, which is thus converted into barium peroxide, and the remainder, with the nitrogen, passes into the atmosphere. After five or ten minutes a series of valves are automatically reversed, the purifiers thrown out of action, and the pump, instead of drawing air into the retorts, rapidly exhausts them of the air they contain, thus creating a partial vacuum. When the pressure is sufficiently reduced, the oxygen previously absorbed is given off by the barium oxide, which is thus restored to its original condition, and, by another automatic reversal of the valve at the proper time, conveyed to the oxygen-holder. This process of deoxidation also lasts from five to ten minutes, at the end of which time the valves are again reversed, and the process repeated indefinitely. The cost of the barium oxide forms only a small item in the expense of producing the oxygen, one charge lasting at least two years. The oxygen passes from the holder through a series of three compressing cylinders. Water is the only lubricant used on the working parts which come into contact with the gas. Water is also admitted with the gas, the flow of which is retarded as much as possible so as to give free play to the cooling water, the heat generated by compression being very great. In the cylinders the gas is compressed in turn to 8, 32, and 125 atmospheres, which is the pressure at which it has been found necessary to charge the storage cylinders at the compressor in order that the gas contained in them may register not less than 120 atmospheres after it has cooled down to the normal temperature. The gas is conducted from the third cylinder of the compressor through a separator attached to the side of the main standard. In this separator the water falls by gravity to the bottom, and the gas passes through an outlet in the top into the filling pipe, and thence into the storage cylinders. All these cylinders are examined before being charged, their valves opened, any gas they may contain blown away. All such as comply with the regulations are then filled. To prevent over-charging, each compressor is fitted with a safety valve, which blows off a pressure of 130 atmospheres. When a cylinder is filled, the end containing the valve is immersed in a tank of water. If no bubbles arise, the cylinder is considered absolutely gas-tight, and ready for use. The visitors were next shown the chamber in which all new cylinders are annealed by being subjected for a time to a dull red heat. This process is repeated about every four years in order to counteract any undue strain received by the metal. After annealing, all cylinders are subjected to a hydraulic test of one and a half tons per square inch (double the pressure to which they are charged), and this test is repeated annually. The testing apparatus consists of a strong iron chamber, in which the cylinder to be tested is suspended. The cylinder and chamber are filled with water to the exclusion of all air, and a perfect joint is made round the neck of the cylinder by a rubber ring inflated with water. The cylinder is subjected to pressure by means of an hydraulic pump, any expansion causing a displacement of water from the chamber, which is detected by a rise in the water level of the gauge glass communicating with the bottom of the chamber. After the maximum test pressure is obtained, the pressure is released, and, if no permanent stretch has been given to the metal, the water will return to its original level in the indicator. If any such stretch has been given, this will not be the case, and the cylinder is rejected as unfit for use. After a cylinder is tested it is stamped with special marks and considered safe by the Company for another year's work. The tests applied are such as to reassure any doubtful person—even a County Councillor—as to the safety of any cylinder charged by the Brin's Company. Some sections of cylinders were next viewed; then the operation of charging cylinders with coal gas. All such cylinders are painted red, and have their fittings threaded the reverse way to those intended for oxygen. The apparatus for testing the quality of oxygen, and the laboratory, were also inspected, and finally some experiments with the oxyhydrogen blowpipe. With this blowpipe an enormous heat is obtained, and large holes are readily burned through thick boiler plate. A heavy bar of iron held in front of the flame was easily fused, the incandescent metal flying about in a manner which made it desirable to stand further away. Thus concluded a most enjoyable visit, and Mr. Murray and the Brin's Company were heartily thanked for their kindness.

AT the meeting on November 12, Mr. Fraser took the chair in the absence of the President. Two new members were elected, after which Mr. LEVETT demonstrated the development of bromide paper, successfully using the Wellington paper and an eikonogen developer.

Croydon Camera Club. Lantern Show.—A crowded audience assembled at the Braithwaite Hall on Wednesday, November 13, when the first of this season's public displays of photography on the lantern screen was held. The first part was graced by that accomplished American lady, Mrs. Catharine Weed Ward, who held her audience completely enthralled by means of the

intensely interesting subject-matter of her slides and the unfailing ripple of gossip, anecdote, and curious information with which she accompanied them. In introducing her to the audience, the President of the Club, Mr. Hector Maclean, F.R.P.S., stated that Mrs. Ward was renowned in two worlds—the old and the new—for her literary and photographic work. This was fully borne out by the masterly fashion in which all the salient points of "Shakespeare's Country," and the many legends and associations connected therewith, were brought out and illuminated. It is impossible to even briefly epitomise the numerous good things which were included in Mrs. Ward's lecture, which, besides the pictorial charm of many of the lantern slides, constituted what was both a revelation and an education to her auditors. In the interval, which was taken later than usual, some welcome vocal and instrumental selections were given under the able direction of Miss Cumbers, who also presided at the piano. Specially praiseworthy were Miss Janner's singing of "Over the Hills," and Miss Jarrett's violin solos from Sullivan's dance music to *Henry VIII.*, the latter receiving a well-merited and strongly marked *encore*. The second part, which for want of time was much abbreviated, consisted of varied slides by members of the Club, including snap-shots of the lady footballers playing at West Croydon, by Messrs. J. Smith and A. J. Noakes, jun., some admirable snow scenes by Mr. A. E. Isaac, and notable contributions by Messrs. G. W. Jenkins, Burn, Rogers, and G. R. White (the Hon. Lanternist), who displayed the long series of slides in his usual satisfactory and facile manner.

Hackney Photographic Society.—November 12, Mr. S. H. Smith presiding.—The HON. SECRETARY reported the Exhibition arrangements to date. A discussion arose as to the probable cause of two parallel lines of uneven toning which appeared on a print on mezzotype paper shown by Mr. Walker. Mr. A. Barker inquired if he had used a dish with ridges in the bottom? Mr. WALKER replied that that was the case. Mr. A. BARKER said he had had uneven toning sometimes when using such a dish, particularly when the quantity of solution used was small. The paper stuck to the bottom of the dish, and the part covering the ridges would be likely to be raised above the surface of the solution. Mr. GRANT had seen a like result when using a ribbed dish for bromide paper development. Mr. RAWLINGS said that the stains on the paper in question might have been caused by using stale paper. Mezzotype did not keep very well. The lantern was then brought into use and a number of Mr. Carpenter's fine flower studies were shown. These were followed by the work of other members.

Richmond Camera Club.—On Monday, the 11th inst., there was a large attendance of members and their friends to witness a display of lantern slides by Mr. H. Little. The pictures comprised views taken by Mr. H. Little in the Riviera and Italy, including the yachts *Britannia* and *Ailsa* in Mediterranean waters, and scenes, chiefly architectural, at Nice, Rome, Florence, and Milan. All the slides were produced in Mr. Little's well-known style, and formed one of the most beautiful and interesting series ever shown before the Club.

Woolwich Photographic Society.—November 14, Colonel C. D. Davies presiding.—Mr. J. H. Gear, F.R.P.S., of the London Polytechnic, delivered the first of a course of three lectures on Photography, negative-making being the subject for that evening, with which he dealt most exhaustively. Commencing with the camera and lens, he successively dealt with the dark room, preparation of developers, plates, exposures, development, fixing, washing and drying, reducing, intensifying, and remedying defects. Mr. Gear's lecture was listened to with much interest, and at the finish he answered several questions. There were about seventy present, members and friends. The somewhat new departure of the Woolwich Society in having a connected series of lectures is calculated by their Council to make the Society more popular, and extend its influence in the district. The lectures commencing in an elementary manner make them intelligible and interesting to beginners as well as to more advanced workers.

Bolton Photographic Society.—The Annual Meeting was held on the 12th instant at the Society's Rooms, 10, Rushton-street, when the following gentlemen were elected as members of the Council:—Messrs. Austwick, Collier, Dalton, Davies, Entwistle, Green, Harper, Johnston, M.D., Leach, and Roscow. Mr. William Banks contributed a quantity of new season's slides, which were exhibited through the lantern by Mr. Leach. Davenport's patent curtain slide was shown, in two forms, and used in the lantern during the exhibition with success. It was decided to have a supper and a social evening on the first Tuesday in December.

Derby Photographic Society.—November 14, Mr. G, Walker presiding.—Mr. H. Hoare was elected a member. Mr. Luboschez, of the Eastman Photographic Materials Company. was next called upon to give a demonstration upon platino-bromide paper for contact printing and also enlarging. The demonstration was an excellent one, and was watched with very close interest by the large number of members present, and at the close a very hearty vote of thanks was accorded the lecturer, as also the Eastman Company, for the very interesting and valuable demonstration. The Chairman announced that at the next meeting Mr. G. Cornwell would give a demonstration of *Printing and Toning Gelatino-chloride Papers*, &c.

Liverpool Amateur Photographic Association.—An interesting demonstration was given in the Society's rooms on the 14th inst. by Mr. J. W. WADE, of the Manchester Amateur Photographic Association, on *Combination Printing*. Mr. Wade showed, in a simple manner, how to introduce skies, foregrounds, or any desired objects, into a picture by combining two or more negatives in the course of printing. The demonstrator emphasised the fact that great care was necessary in cutting out and fitting the masks to cover those portions of the negative not required in the print, and that accuracy in this respect was only to be obtained by great patience and by practice. He exhibited a number of excellent examples, printed from two, three, and four negatives, also showing the several negatives from which the prints were made, with the necessary masks in position. At the conclusion of the demonstration, a number of lantern slides, made by a similar process, were passed through the Society's lantern, and a hearty vote of thanks to Mr. Wade concluded an enjoyable evening.

Llandudno Camera Club and Lantern Society.—The Annual Meeting was held in the Club-room, Bodhyfryd-road, on November 14, when the election of officers took place, and resulted as follows:—*President:* Right Hon. Lord Mostyn.—*Vice-Presidents:* Dr. Dalton, J.P., and Messrs. Elias Jones, J.P., and A. H. Hughes.—*Treasurer:* Mr. W. Williams.—*Hon. Secretary:* Mr. E. Deacon, 64, Mostyn-street. A hearty vote of thanks was passed to the retiring officers, after which the meeting closed. Since the recent disastrous fire the Club rooms have been entirely refurnished and decorated, and the dark room rebuilt and enlarged. The Llandudno Camera Club can now boast one of the best Club rooms in the principality.

Newcastle-on-Tyne and Northern Counties Photographic Association.—Mr. J. Hedley Robinson (Vice-President) in the chair.—Mr. JOHN WATSON (Vice-President) read a paper on *Matt and Rough-surface Printing Processes* [see page 745], illustrating his remarks by numerous examples on various papers.

Oxford Camera Club.—The first meeting in November was held on the 12th instant, in the Holywell Music Room instead of in the Museum as usual. The change was necessitated by its being the occasion of the second annual Exhibition of members' work, for which the Museum was not convenient. To avoid expense, it had been decided to confine the Exhibition to members, and only open it for a short time—two to ten p.m. The pictures were previously sent to Colonel Gale, who kindly acted as Judge, his report being read out during the evening. Members' friends were admitted by ticket at a small charge, and a large number availed themselves of the opportunity. The competition slides were exhibited at nine p.m. There were 294 entries in all; 280 for prints, and 14 sets of lantern slides. The work as a whole seemed to give general satisfaction, and for so young a society the Exhibition may be regarded as a distinct success.

Photographic Society of Ireland.—Under the auspices of this Society, Mr. FREDERICK CLIBBORN, of Liverpool, delivered two very successful lectures on Wednesday, November 13, and Friday, November 15, entitled, respectively, *Innocents Abroad* and *Up and Down North Holland*. The lectures were delivered in Mr. Clibborn's usual racy, jocular, and fluent method, and gave unbounded satisfaction to the large audiences which attended on both occasions. Indeed, comment is unnecessary, if we take into consideration the high reputation of the lecturer. At the close of the meeting Mr. RUTHVEN announced that at the next gathering of the members there would be a conversational smoking evening, when photographic topics would be dealt with. All the meetings of this Society have been well attended so far this session, and it is to be hoped that as things have begun so successfully there will be a continuance.

FORTHCOMING EXHIBITIONS.

1895.	
November 22–30.....	*Stanley. Walter D. Welford, 59 and 60, Chancery-lane, W.C.
,, 28–30.....	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.
December 18–20	Blairgowrie and District Photographic Association. J. C. Gorrie, Hon. Secretary.
,, 20, 21.....	*Nottingham Camera Club. W. Edgar, 123, Clinton-terrace, The Park, Nottingham.
1896.	
March	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

A BUSINESS TOPIC.

To the EDITORS.

GENTLEMEN,—The following are the figures *re* cheap-portrait photography which I referred to in your previous issue. These figures I collected lately when I had an excellent opportunity of learning something of the inner working of a firm of cheap photographers. I can, therefore vouch for the general accuracy of these figures. This one firm has twelve branches in various parts of London; their scale of prices is extremely low, and the work of fair quality at the price. They charge 5*s.* for cabinets, 2*s.* 6*d.* for *cartes*, and 1*s.* for midgets per dozen. The enormous quantity of work done at these prices came upon me as a surprise, as I think it will to many others in the trade. For instance, some branches will take as much as 40*l.* per week, others no more than 20*l.* I estimate that, taking the average of the twelve branches throughout the year, it cannot be less than 25*l.* per week, making a weekly taking of 300*l.*, and a yearly of about 15,000*l.*

The prints turned out by this firm vary from 2000 to 7000 a day. Taking an average of 5000 a day or 30,000 a week, we have the grand total of 1,500,000 prints a year; this gives 1,500,000 prints for 15,000*l.*, or

1*l.* the 100, and, adding the three sizes together, 2*s.* 6*d.* for every dozen prints, which is about the low-water mark of photographic prices.

What is the moral to be drawn from these figures? In the first place, supposing the prices charged were four times the amount given, say 1*l.* for cabinets, 10*s.* for *cartes*, and 4*s.* for midgets per dozen, this would give a total value to the product of 60,000*l.* a year, an advance of 45,000*l.*; and this 45,000*l.* I consider as a dead loss to the photographic trade as a whole; for it must be remembered that photography deals only with the well-to-do of every class, and that the person who can afford to pay 5*s.* for a dozen cabinets can well afford to pay 1*l.* or even more. An increase of price might result in a decrease of sitters, but I do not think to any large amount; even if it did, I am sure the business done would exceed the 15,000*l.* a year at the lower prices. It must also be considered that I am dealing with only one firm, there are several others in London; and, taking them together, it is obvious that these men are enriching themselves and impoverishing the large mass of photographers. Reckoning the population of London at 4,000,000 this firm alone could supply every man, woman, and child with a print every three years. This time, I may remark, is the same as that when photographers expect a return of their regular customers.

Estimating every sitter to this firm to receive twelve prints, the total of sitters is 125,000 per year. In three years it will amount to 375,000 sitters, which alone, would soon exhaust the possible sitters from the 4,000,000 of London. From what class do these sitters come? Largely from the class who at one time relied upon the higher type of photographer, and who could well afford to support him now. This desertion for the cheap man is, I believe, the cause of the position in which these men find themselves at present; more especially in London, which has the greatest facilities for a cheap trade. The demand for portraits is satisfied at a cheap rate, and the trade grows poorer, for the simple reason that the demand is a fixed quantity, and also a demand that can be supplied at a high or a low price at the will of the photographer. Does this cheap work pay? Undoubtedly it can be made to pay, and pay well, by grinding down the cost of material to a sweating point, and by cutting wages down to a starvation level. The plan of operation is to take the trade of the middle-class man, by cutting down prices, and then to take advantage of his well-trained assistants' necessities to obtain skilled labour at a paltry wage.

The remedy, I believe, is to keep up the standard of work. The public will always pay double and treble for a good photograph to what they will for a bad. Without doubt the public can be educated above this cheap work if only the better-class man stoutly refuses to come down to its level.—I am, yours, &c.,

JOHN A. RANDALL.

118, *Cregoe-street, Birmingham, November* 15, 1895.

HIGHER CRITICISM.

To the EDITORS.

GENTLEMEN,—We have heard a deal of dissatisfaction expressed lately with the style of criticism in vogue in the photographic press. This cry has been most loudly raised by gentlemen whose names one associates with the Camera Club, so that now, since the *Journal* of that institution has for the first time contained Exhibition criticism, we naturally look to it to ascertain exactly what this higher criticism is.

It commences historically. Carlyle, it is said, recommended Macaulay's history to an invalid who had been advised to read light fiction, and in this respect the effusion signed "Heliodorus" suggests Macaulay. Whether the style is an echo of that writer also, my extracts will show. It will be remembered that some four years ago, in consequence of the demand by two members of the Council of the P.S.G.B. for privileges and advantages not granted to outsiders, and refused in consequence to the two in question by the Secretaries, the conduct of the latter gentlemen was impeached by the two members implicated. As a result, the Society without a single dissentient voice exonerated its officers, and the two members who had demanded such exceptional treatment, left the Society, and two years later inaugurated the Salon. This has been referred to as the *New Movement* and such it undoubtedly was—a movement that has resulted directly in placing the Photographic Society in its present pre-eminent position, and in convincing the general photographic public that, at its Exhibition at least, favouritism shall be unknown. The Camera Club critic thus describes the incident. "The P.S.G.B. never did an unconsciously wiser thing for the art to which it owes its existence than when it chucked (*sic*) out, a few years ago, the most progressive spirits and most earnest workers to find for themselves."

After more history of a similar kind, a few of the pictures at the Salon are referred to in a way which must please all admirers of terse and vigorous English as found in the columns of the *Pink 'un*. Not to trespass on your space too much, one example must suffice.

"Mr. Annan, as he did last year, bears away the palm for originality and style. His *Lady in Brown* (No. 161), however, frankly imitates Mr. Whistler, would knock spots out of that excellent eccentric painter, on his own ground—giving him the colour—if Mr. Annan did not take his art seriously."

(An old lady friend to whom I have shown this, says she is convinced that no picture will cure Mr. Whistler's spots, but that it is only a question of impure blood, and that camomile tea would soon give him back the colour, poor fellow, which he seems to have lost, and entirely remove the unpleasant eruption from which it appears he is suffering.)

After about a page of this kind of criticism we get more "history," and with a suggestion to the R.P.S., which it is sure to receive with gratitude and to act upon forthwith, the first specimen of "Higher Criticism" ends. May we hope that in future you will employ a "High Critic" for your Exhibition notices?—I am, yours, &c.,

A CRITIC.

THE PHARMACY ACT.

To the EDITORS.

GENTLEMEN,—If chemists and druggists are to have the sole and only right to sell poisons, why should they not be taxed for that privilege the same as others? Solicitors have to pay 9*l.* a year and auctioneers 10*l.* Surely the privilege they enjoy under the Act is worth as much. I fear, however, if this were done they would very soon seek to get rid of their duty, as they term it. The extortionate charges they make for drugs is too good a thing for them easily to give up. Let me give two instances. Some years ago I gave a medical gentleman the recipe for an intensifier of a simple kind, the chemicals for a ten-ounce bottle of which would cost three farthings. What was his surprise when he found that the druggist with whom he dealt had charged him no less amount than 3*s.* 6*d.* for it. Another instance. A young lady has been recommended by her physician to take considerable quantities of the subnitrate of bismuth. She buys it from her druggist in half-pounds. The wholesale price for the substance is 3*s.* 6*d.*, but she is charged 11*s.* a pound for it. Instances like these go to show that the privilege conferred by the Pharmacy Act is of much too valuable a character to be easily given up. The remedy, if they will insist upon enforcing their so-called *duty*, is a simple one. Tax them, tax them, like other people.—I am, yours, &c.,

Edinburgh, November 15, 1895.

CYANIDE.

POÍSON! POISON!! POISON!!!

THE EDINBURGH MARTYRS. "BANG WENT SAXPENCE."

To the EDITORS.

GENTLEMEN,—The laws regulating the sale of poisons were not made for the express purpose of giving satisfaction to every one. In its now proverbial character of "a Hass," the law, besides offending Mr. Bumble, often makes worthy people feel very angry. Even I, the least worthy of your numerous correspondents, find my "necessary harmless" business obstructed. I have received from esteemed clients orders for "a gallon of alcohol," six gallons of methylated spirit, &c.; but I may not execute such orders. In steps "the Hass," and obstructs me with the statement that I am not legally qualified, shows its teeth and its heels, and brays about fines and penalties; so I relinquish the anticipated "saxpences" and yield to the superior physical force.

The Scotch dealers, having been fined for failing to establish legal qualification, modestly assume the mantle of superior intelligence, which, if conceded to them in order to conceal their wounded feelings, would enable them to step forward and obtain the legal qualification without much mental exertion.

But amplified legislation to further regulate the sale of poisons and other dangerous or explosive substances is both urgent and imminent. Not only sellers, but buyers also, ought to be held responsible and liable for transactions in, or the possession of, such substances under irregular or illegal circumstances or conditions. "How oft the sight of means to do ill deeds makes ill deeds done." Legislation must keep pace with science, or the Powers of Darkness will win the race. Neither are accidents and suicides so scarce as to need encouragement and convenience.

Only about two years ago a gentleman conceived the idea of writing to the Pharmaceutical Council upon the important subject of sulphocyanide of ammonium. Having obtained a reply from the secretary the fact was announced in the photographic periodicals, how that he, the writer, had been told by the Pharmaceutical Council that sulphocyanide of ammonium was not a legally qualified poison, and that therefore it could legally be sold by anybody who "went into" the photographic trade—result, a coroner's inquest the following week on a case of suicide at Cambridge by means of sulphocyanide of ammonium.

There must be a line drawn somewhere, and if men qualified by superior intelligence will also qualify by law, all the delights and luxuries of the poison trade, with its fruit of "wealth beyond the dreams of avarice," *i.e.*, saxpences innumerable, will be theirs. The Edinburgh saxpence bangers are most business men, but the spectacle of mature gentlemen in a scientific instrument shop angrily asserting their claims to superior intelligence can only be paralleled by a squabble in a bonnet shop over a question of personal attractions. A Scotch joke is not bad, after all, in spite of proverbial remarks to the contrary.—I am, yours, &c.,

PHARMACIAN.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

To the EDITORS.

GENTLEMEN,—There seems a misconception as to the exact date for the Exhibition of slides, illustrating the scenes visited during the Convention at Shrewsbury in July last.

Will you kindly allow me to state once more, that Wednesday, November 27, is the date fixed, and the Exhibition will take place in the Photographic Club's room in Anderton's Hotel, Fleet-street, at 8 p.m. I shall still be glad to hear from other members of Convention as to their intention to send slides for exhibition.

The members of the Photographic Club will gladly welcome in their club-room that evening any members of the Convention.—I am, yours, &c., R. P. DRAGE, *Hon Secretary.*

95, *Blenheim-crescent, London, W., November* 19, 1895.

LEYTONSTONE CAMERA CLUB EXHIBITION.

To the EDITORS.

WOULD you be good enough to make known that we have extended the time for receiving pictures until November 23?—I am, yours, &c., B. HARWOOD, *Hon. Secretary.*

110, *Windsor-road, Forest Gate, E., November* 18, 1895.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon.*

J. CHESTER JERVIS.—Thanks. The process is probably chromo-collotypy.

C. WILLIAMS (Swansea), S. W. E., and AMATEUR (York) will find a reply to their queries in another column.

WM. GIRLING.—The difficulty has arisen from the negative not having been sufficiently washed in the first instance, and, probably, also in the subsequent operations. We fear there is no remedy now.

TOMPO says: "I shall feel grateful if you will kindly say in the JOURNAL if it is possible to thin Canada balsam when it becomes too thick, and, if so, what is the best means?"—The balsam may be thinned with turpentine to any extent.

LLAMDRINDOD writes as follows: "Will you kindly inform me whether a photographer has the right to sell photographs that have been paid for, and was requested at the time not even to exhibit them?"—Certainly not. He renders himself liable to action in a court of law.

W. G. B.—If the varnish is to be used on the cold plate, it is one, we surmise, made with benzole as a solvent. In that case, methylated spirit is not a suitable dilutant, and its addition would fully account for the dull surface and precipitate. Benzole is the right thing to thin such a varnish with.

WALTER L. NASH.—Under-exposure is possibly the cause of the trouble. With either developer there should be no difficulty with the plates named. With pyrogallic acid any amount of density is obtainable, provided, of course, the exposure is right. If that is insufficient, the trouble is fully accounted for.

HERTFORD.—The prints are very pretty, but, as they are snow scenes, they should not be printed on silver paper and toned to a warm brown. They should be on platinotype paper to be in keeping. Most dealers supply mounts for Christmas-card photographs. Consult our advertisement columns.

O. PARKER.—The lens is scarcely suitable for the work. You would do better to use a microscopic objective of not less than two inches' focus. With that, and proper illumination, you will obtain the definition you desire. The example enclosed is about as good as might be expected from the lens employed

N. BORDMAN complains that all the lantern slides he makes, using ——'s plates, are cold and inky in tone, as well as becoming too dense before all the detail is brought out. Under-exposure is the fault. Try giving four or five times the exposure, and use a well-restrained developer. There will be no difficulty then in getting warm tones.

T. E. W.—The bright patch in the negative is due to the sun being reflected direct in the lens from the street lamp. We are surprised that the reflection was not noticed when the image was focussed, or when the exposure was made. In a few minutes the angle of the sun would have altered, and the reflection of it would not have fallen on the lens.

S. E. J.—Either collotypes or process blocks will be the best, but in either case they must be really good. With the former process much bad work is now produced, and with the latter also; but here the printing and the paper are more generally the fault than the blocks themselves. With either method the best results must not be expected for a low price.

G. STONE writes: "Would you be kind enough to tell me how to become a member of the Royal Photographic Society, or Fellow, as I don't quite understand what 'opting' means, in the JOURNAL of November 8, p. 708, as I am anxious to become one?"—You had better inquire for particulars of membership of the Assistant Secretary of the Society, 12, Hanover-square, W.

INFRINGEMENT.—Certainly you have no redress, and the paper did quite right in refusing to pay you anything for the right. The lady sent the portrait to the journal, and she paid you for taking it. Why should the journal pay you for it as well? If it *had* attached your name to the portrait, it would have been, under the circumstances, merely as an act of courtesy, and not as a matter of right.

R. W.—If the engagement was for a year from March last, you cannot be discharged till March next, unless your employer can prove that you are neglecting your duties, or some fault of that kind. "Business being exceptionally bad and the winter coming on," or any reason of that sort, will not relieve him of his obligation. He will have to pay you up to the end of the term he agreed for.

D. KIRK.—Accumulators, or secondary batteries, will do quite well for electric light for portraiture; but, of course, they would be of no use unless you have the means of charging them, either from a dynamo or from a main. If there is a main in the street, and the current is always on, there is no need for the secondary batteries. From the tone of your letter, we rather surmise that you are confusing "accumulators" with primary batteries.

H. A.—We can see no fading of the picture. There is quite as much detail in that part that has been exposed to the light as in that which has been protected by the mount. All that has taken place is that the pink colour with which the albumen was tinted has faded by the action of the light, and left the paper somewhat yellow. It is the tint on the albumen that has faded, not the photograph. To avoid this in future, either employ white paper or do not expose the prints in the show-case.

NERO says: "In making opalines I find the 'gelatine prints' have a tendency to leave the glass round the edges after two or three days' drying before the backs are glued on and after. Can you please tell me the reason, as I have experienced just the opposite when using glass to enamel prints, finding the greatest difficulty in getting them off?"—If the prints are mounted on the glass with a thin solution of gelatine, there will be no danger of their leaving the glass, provided, of course, that the latter was free from grease.

J. REYNOLDS.—The most cleanly way of heating the studio is by means of hot-water pipes, the boiler being placed in an adjacent outbuilding, such as are used in greenhouses and conservatories. Small boilers, with slow-combustion furnaces, are supplied and fitted by all horticultural builders. Next to that, as you have no gas, will be one or other of the slow-combustion stoves to stand near the middle of the room. Paraffin is scarcely to be recommended for so large a building, and, moreover, there is an unpleasant odour given off unless the burners are kept in exceptionally good order.

PHOTOPHIL (Valencia, Spain).—The rottenness of the film appears to be due to the employment of a cotton which yields a film of too porous a character. Try another sample that yields a film of a more horny nature, or a mixture of it with what you have. Weak ether may be strengthened, but, for photographic purposes, not without redistilling it. Surgical collodion is not suitable. If you are a beginner in the collodion process, we should recommend you to purchase the collodion ready for use, instead of trying to prepare it yourself. Most professional photographers in this country do so.

CONTENTS.

	Page
OUR FORTHCOMING ALMANAC	737
MECHANICAL *VERSUS* CHEMICAL METHODS OF IMPROVING NEGATIVES	737
REVERSED NEGATIVES ON WET PLATES	738
PIGEON POST: MICROGRAPHIC DISPATCHES DURING THE SIEGE OF PARIS, 1870-71	740
"A BLIND LEADER OF THE BLIND" By A. HORSLEY HINTON	741
CARBON JOTTINGS. By LESLIE SELBY	742
CHANGING THE STOP. By EDWIN C. MIDDLETON	743
PHOTOLOGY. By J. VINCENT ELSDEN	744
ROUGH-SURFACE PAPERS. By J. WATSON	745
SOME FACTS ABOUT GLASS	746
OUR EDITORIAL TABLE	746
NEWS AND NOTES	747
RECENT PATENTS	747
EXCHANGE COLUMN	747
MEETINGS OF SOCIETIES	748
FORTHCOMING EXHIBITIONS	750
CORRESPONDENCE	750
ANSWERS TO CORRESPONDENTS	75

THE BRITISH
JOURNAL OF PHOTOGRAPHY.

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OUR FORTHCOMING ALMANAC.

The Almanac for 1896 will be published on Monday, December 2. It will exceed its predecessors in size by a considerable number of pages. The frontispiece is a portrait of Sir Henry Trueman Wood, M.A., President of the Royal Photographic Society, the negative being by Mr. W. J. Byrne, and the prints by Messrs. Morgan & Kidd, of Richmond.

The Editorial articles deal with Photographic Optics and the Wet-collodion Process respectively. About 150 of the ablest photographic writers and experimentalists contribute articles, and several useful tables have been added to the volume.

THE DEFENCE OF PHOTOGRAPHIC COPYRIGHT.

The annual meeting of the Photographers' Copyright Union, which was held last week, was successful from all points of view. The attendance was large and thoroughly well representative of the three divisions of photographic workers whose interests are bound up with the defence of copyright as applied to photographs—photographic publishers, professional photographers, and amateur photographers. It certainly augurs well for a movement of this nature that its warmest supporters are to be found among our foremost photographers and practical men of business.

The report, which deals with two years' working of the Union, details the accomplishment of an amount of work of which the Committee may be proud. It is satisfactory to find that over a thousand professional photographers throughout the kingdom gave their signed adherence to the principles of the Union—chief of which is that every member shall agree to make a minimum charge for the use of his copyright subjects on every occasion that they are reproduced. It is mutually to the credit of the Union and the editors and publishers of the illustrated newspapers that the majority of the latter have, in the words of the report, met the demands made upon them for the use of photographic subjects in "a courteous and reasonable manner." The Committee point with pride to the handsome results which have accrued to both London and country members by the exercise of the Union's principles, and they are equally well entitled to self-congratulation on the results of two or three contested cases against infringers which have resulted favourably for members.

Excellent as this record undoubtedly is, it behoves the Union not to relax its self-defensive efforts or its vigilance, or to neglect any opportunity of attracting the moral and materia support of all sorts and conditions of photographers. The illustrated press is daily widening its sphere, and the importance to it of reproductions from photographs threatens to be vital for years to come. Hence photographic copyright is likely to acquire such a degree of commercial value that its protection will become a matter of almost individual care.

The Committee evidently foresee this, for at the meeting last week a number of rules were proposed and carried which will throw membership of the Union open to all photographers without distincton, and thus have the effect of attracting to it what it is strenuously seeking to obtain, viz., the moral support of all interested in assuring that copyright photographs shall not be reproduced or otherwise made use of unless they are paid for, as is the work of artists, authors, and designers. In future, therefore, amateur photographers will be qualified to become members of the Union. Again, *there is to be no annual subscription*, a donation fund taking its place, the working expenses of the Union for the forthcoming year being guaranteed by the Committee. Finally, the rule with regard to the members' minimum charge of 10*s.* 6*d.* for the reproduction of any copyright photograph has been altered so as to apply to *one issue* only—a most important safeguard.

We hope that, by their spirited action in abolishing an annual subscription and admitting amateurs, the Committee of the Union will receive a large accession of new members from both professional and non-professional circles. The compulsory recognition of the financial value of photographic productions by those who may wish to make, or do make, use of them is a good and just cause which the Union will be the better able to fight the more powerful it becomes. We wish it every success in its endeavours, and, in urging those of our readers who have not done so to join, we relieve them of every excuse for not knowing whom to apply to for particulars by indicating the name and address of the Secretary as Mr. H. Gower, Photographic Copyright Union, Chamber of Commerce, Botolph House, Eastcheap, London, E.C.

DEVELOPING ORTHOCHROMATIC PLATES.

Considering that the undoubted advantages which orthochromatic or isochromatic plates do possess when applied to their own specially adapted purpose do not in any way unfit them for ordinary landscape or portrait work, it is somewhat remarkable that their use is not more widespread than appears to be

the case. In fact, quite recently the question was put to us, Why should not this class of plate be used to the entire exclusion of non-orthochromatic? The answer, of course, is simple enough: there are, comparatively speaking, few makers of the latter plate and a large number of the former, and already plate-users are beginning to develop a decided conservatism of practice, and are not so ready to chop and change, as once was commonly done. Outside all these considerations, however, there is another which we think mainly operative. This is the fear of fog in the dark room through the use of "unsafe" light, or the difficulty that would be experienced in working with a "safe" light. Now, we have long since pointed out that there is no such thing, even for an ordinary plate, as a safe light, and that the term is purely a relative one.

It may be taken as true that all visible—besides, of course, many invisible—radiations, if allowed to act for a sufficiently long time upon the average dry plate, will produce a developable effect. It is thus evident that, in judging of what must be called the expediency of a light for the dark room, three factors must influence the decision—the time element, the actinic element, and the luminosity element. At present the data on these three points are not sufficient to enable any one to say, *à priori*, that a particular light screen is most suitable; and, of course, the window most suitable for one plate is less so for another, and so on; hence a universal screen, the best for all purposes, is not possible.

But this need not act as a drawback to the use of orthochromatic plates. It may be taken that a large number of photographers who, in the laudable endeavour to secure their plates against fog in the dark room, use a light far within the limit of safety for ordinary conditions of working—a light which would not fog a plate if it were left exposed for three or four times the normal probabilities. We have, when changing ordinary plates away from home, frequently discarded all use of yellow screen or ruby lamp. Placing a candle outside the bedroom door, more or less ajar, according to our position in the room, we have unhesitatingly, using the most sensitive plates we have tried, emptied and recharged slides with sufficient illumination from the reflected candlelight to be able to see what we were doing. But then we worked with discretion, exposing each plate for the minimum possible time, and the result was that not a trace of fog was perceivable on any of the plates so treated. But, if the plates during changing had been spread out in a row and put away or in the slides one by one in leisurely act, the result would have been disaster. The moral we would draw is that, if such a light were, under the conditions, safe with an ordinary plate, it would also be safe with an orthochromatic plate; but the sensitiveness of the most ultra-orthochromatic plate ever made to the yellow and red radiations is very far indeed below the sensitiveness of an ordinary plate to white light; hence a luminosity emanating, say, from the D region of the spectrum might be used for a yellow sensitive plate with an intensity far exceeding that we have been describing. We may be told that it is no news that the part is not equal to the whole, but the luminosity of the light from this region may be increased to a degree beyond that due to it as a constituent part of the whole luminous spectrum, and yet remain "safe" under the conditions.

To put a practical point upon our remarks it will be proper to describe a series of experiments we made in one of the dark rooms we work in largely. It is lighted with an overhead lamp, screened with a combination of glass and fabric, which, under our mode of working, never gives fog. There is plenty of light in the room, except in the place where the plates are changed; the developing dish can be placed in a graduated light, according to the period of time it will be exposed. There is also another light, screened with two colours of glass, and capable of being reduced or altered by other additions, but which only illuminate the plate when brought before for examining density, &c. We are aware that we work well within the bounds of safety, but we have light enough now without making any alteration or change of system or lighting whatever. We worked with a number of a well-known brand of orthochromatic plates, and not a single plate was the worse for the treatment. Here is distinct evidence that there is no practical difficulty whatever in working orthochromatic plates with plenty of light to enable one to develop in comfort. But, just as the use of the naked candlelight described must be conducted with judgment, so must the use of ordinary dark-room light for orthochromatic plates. It is perfectly safe when used with Opie's oft-quoted medium and with ordinary judgment.

Photographs of Coins and Medals.—The sale of the Montagu Collection of coins, last week, created quite a stir in the numismatic world. Anent this subject a correspondent writes, asking how the photographs of coins that appear from time to time in the *Numismatic* and other journals are produced, because he has tried in different ways to photograph medals and has failed to get anything like them, either with orthochromatic or ordinary plates. The method is very simple when it is known. It is this: the photographs in question are not taken direct from the coins at all, but from plaster-of-Paris casts from them, by which means all reflections from a metallic surface are avoided. The plaster is slightly tinted, so that its excessive whiteness is destroyed. Where photographs of medals—gold, silver, and bronze—have to be included on one plate, the casts are tinted to different degrees, the bronze being the darkest, the silver lightest, and the gold of an intermediate tint. By working from casts, it will be seen how the obverse and reverse of medals are obtained on the same negative.

Photographing Prisoners.—It is announced that the Home Secretary has given notice that, under Section 8 of the Penal Servitude Act of 1891, he intends to make rules with regard to the future measuring and photographing of prisoners. That the present system of photographing prisoners is, as we have pointed out before, very unsatisfactory, there is no question. The work is often done by a warder who knows little or nothing about portrait photography, and who has to take the photograph under set conditions. As a consequence, the portraits are often mere maps of the face, and frequently more misleading than otherwise; whereas, if the photographs were taken by a skilled portraitist, who could exercise his judgment, far better likenesses would be secured, and the police greatly assisted in after-identification. In some provincial jails a local portraitist is, or used to be, engaged to photograph prisoners, with the result that good and striking likenesses were obtained, though sometimes with difficulty with refractory sitters. When the Home Secretary frames the new rules, as regards photographing, he will do well to take into consideration the fact that in portraiture no fixed rules can be laid down, if the best likeness of an individual is the chief consideration, and it certainly should be in the identification of criminals.

The Pharmacy Acts.—The recent action of the Pharmaceutical Society in Edinburgh has brought forth some strong comments in our and other columns. A correspondent last week made a suggestion that might better perhaps have been made to the Chancellor of the Exchequer as a suggestion for the next budget. It is usual that, when a special monopoly is granted to any particular trade, they are specially taxed in the form of a licence for it. Few tradesmen make such large profits as pharmaceutical chemists, they

often charging as much for a single ounce of material as a pound cost them, and they could well afford to contribute something for the monopoly. A correspondent tells us that proceedings against photographic dealers by the Pharmaceutical Society have been far more rife since so many of the "duly qualified" have taken to vending cheap photographic apparatus and supplying photographic material generally. Be that as it may, one seldom finds them prosecuting other than photographic dealers, yet prohibited articles are daily sold by others. Some of the poisons scheduled in the Act, and many others that are not, may be obtained at most of the oil shops and at the drysalters'. Possibly, however, proceedings may be threatened, and "hush money" paid to avoid them. Some strong comments on the Society's system of exacting penalties to save prosecutions were made in this and other photographic journals a year or two back.

The Metric System.—One day last week a large deputation from Chambers of Commerce and other bodies waited on the First Lord of the Treasury, who was accompanied by the President of the Board of Trade, to present a memorial in favour of the adoption of the metric system in this country, according to the recommendations of the Select Committee of the House of Commons, some little time ago. These recommendations were that the metric system of weights and measures be at once legalised for all purposes, and that, after a lapse of two years, it be made compulsory by Act of Parliament; also that the metric system be taught in all public elementary schools, and that decimals be introduced at an earlier period of the school curriculum than is the case at present. Mr. Balfour, in his reply, was quite in favour of the metric system, its being legalised, and its being taught in the elementary schools; though he did not see that it would be advisable to make it compulsory as yet, but thought that the end might be brought about by gradual evolution. It may be, but it will not in the near future. English tradespeople—and they are the ones who have the greatest influence on this question—are too conservative for that, we fear. Of the convenience of the metric system to photographers there cannot be two opinions. All foreign photographic formulæ, America partly excepted, are given according to the metric system, and these a large proportion of photographers cannot convert into English equivalents. A few years ago the Photographic Club took the matter in hand, and were promised the support of most of the leading societies, though nothing practically came from it. Another attempt now might be more successful. Is this not a question that could be dealt with by the affiliated societies, and successfully too perhaps? The metric system is bound to be universally adopted, sooner or later; but why should photographers wait?

The Illustrated Press and Photographers.—Since photographers have enforced their rights, in the copyright of their works, against the illustrated press, it has been very sore on the point. Recently it has waxed quite wroth on the subject, and the number of letters upon it has been as great in the *Times* as if a "sea serpent" has been sighted. The complaint is that photographers expect to, and now will, be paid for their property, and will no longer submit to its being appropriated by the illustrated press, as it was wont to do. Complaint is made of the charges of the owners of the copyright in the portraits of some illustrious persons—ten pounds in some cases—but why do the papers pay them? Why do they not obtain sittings if they have influence enough, and take their own pictures? The answer is simple: As a matter of business, they know it is better to pay a small fee to obtain what they want than have to go without it. In a recent suit for the infringent of copyright, in which substantial damages were given, Mr. Baron Pollock told the jury that a man had as much property in his copyright as he had in any of his personal possessions. After all, the property being that of the photographer, it becomes simply a question of vendor and purchaser. The former can fix what price he likes upon his wares, and the latter can buy them or leave them as he likes; but, if he steals them, he must take the consequences. No question has ever been raised as to the price that a painter may charge for his work—sometimes a question of hundreds of pounds—yet he has no greater property in his copyright than the photographer has in his. Both have the right to fix what price they like upon it, whether it is worth it or not, but no one is compelled to purchase. This spasmodic agitation in the lay press, coupled with the recent one as to whether photography is a fine art, leads one to inquire whether there is likely to be a sequel to it in the near future? The programme of the present Parliament is that of domestic and social legislation. Several new copyright acts have been projected in past parliaments, but have been crowded out at the end of the session by more important business. It is noteworthy, however, that all those Bills were framed more in the interests of publishers, printsellers and the like, than in those of photographers. As we intimated a little while back, photographers need be on the alert or their interests may suffer.

PHOTOGRAPHIC IMPRESSIONS AND FINGER-POSTS.

[Richmond Camera Club.]

First Impression.

In acceding to the request of your Secretary to deliver a paper before you, my first impression was that I had better not do so, the reasons for which being that I have both listened and read "full many a time and oft," and, truth to say, the longer I live the less I like the premeditated hash of indigestible verbiage usually present in written papers.

There are other reasons why I prefer to talk *ex tem.*, it is so much easier to trim one's observations to suit the needs of the moment, and there is, besides, a delightful sense of irresponsibility for heterodox opinions which, on the spur of the moment, are allowed to pop out, particularly when it is noticed that there is no recording pressman to perpetuate one's indiscretions.

On the other hand, I remember that written papers serve certain humble, but perhaps none the less useful, offices.

Firstly, they supply the technical journals with a lot of free copy, thereby enabling the societies to make some return for valuable help freely given; secondly—and this is really a matter of some importance, from a society point of view—papers printed in the public journals remind amateurs that in their midst there exists a photographic association which is ready to help and to educate the photographer, and which is striving to unravel some of the chemical, optical, and physical tangled skeins that for the present make the advancement of photographic procedure somewhat slow.

So much for my first impression. Hence

Finger-post I.

pointed to my coming here this evening and troubling you with my opinions.

Second Impression.

My second impression was that it would be well to read you a paper without a subject, for doing so would permit me to touch upon any matter that might come uppermost at the time of writing, thereby enabling me to impart my most up-to-date remarks upon current matters.

At the risk of relating a twice-told tale, let me, to commence, deliver some few words respecting our great Exhibitions.

By great, I, of course, mean relatively, as the fly is to the flea, for neither the Royal nor the Ring Exhibitions can claim to be even distantly mammoth-like in importance when measured with the leading pictorial displays of our painters.

One thing amongst many others which struck me as a particularly useful object-lesson was the award, at the Royal Photographic Society's Exhibition, to Mr. R. B. Lodge of a medal for birds taken with a tele-photo lens. I remembered it was only last year that the said lens was brought prominently forward, when its possibilities immediately struck me, and, had I been "to the manner born," I should certainly have invested in a naturalist's hand camera, and spent the sunny months in stalking.

I had a talk with Mr. Lodge at the Royal Photographic Society's *soirée*.

"Very wonderful," said I. "Tele-photo lens—Mont Blanc, forty miles—like modern rifle, snap-shoot wild birds which are out of sight!"

Mr. Lodge in reply smiled encouragingly.

"Suppose you stood a long way off to take this?" I continued.

"Guess," said he.

"Quarter mile? Hundred yards?"

"No," said he, "about ten to fifteen feet!"

"But how," I gasped, "do you get so close?"

"Easy enough," he enigmatically answered. I pressed for an explanation. "What I do is *simply this*, tie myself up in a sack, and lie for nine hours in a ditch!"

Finger-post II.

One, if not more, of next year's medals is likely to fall to that enterprising individual who uses the most novel and effective of the inventions introduced in the Exhibition just closed. I am not going to bore you with a *résumé* of the apparatus, but content myself with prophesying that the most likely aid to that making of new pictures which shall possess technical features not hitherto noticeable is the new Cooke Lens; this not merely for its flat field and anastigmatism, but as much because of the property I hear it possesses of rendering portions of the picture which the photographer designedly throws out of focus, not, as is generally the case with other lenses, by means of more or less distinct circles of light eating into the darker groundwork, but by a subdued yet definite imaging of the outlines of objects which are behind the plane of sharp focus, such rendering much better approximate subsidiary portions of a picture to the treatment which they usually receive from a painter than is the case with lenses hitherto employed.

Third Impression.

All things considered, I almost think the less you go to photographic Exhibitions the better for your photography. There is, of course, much good in the displaying of new apparatus and so forth; but, on the other hand, there is small reason to doubt that the amateur's awestruck veneration of those "dim miniatures of greatness"—there is no mistake about the dimness in what we are told are the glories of the camera—this kind of worshipping of the commonplace by the crowd, must needs lead to stunted aims.

That the copy always falls short of the original is accepted as a truism; hence to found one's pictorial expression upon other people's photographs, in which, as a rule, nature is imperfectly clutched at, rather than held, and in which the flavour of graphic art is but faint, is to be foredoomed to mediocrity.

Besides which, Exhibitions greatly aggravate that dreadful disease with which all mankind are now more or less cursed, which I will term

Photophthalmia,—a disorder which causes us all to see nature second hand, viz., as presented to us by the lens of the camera, and further filtered through capricious dry plates and deluding printing processes.

Painters, who are naturally the greatest sufferers, are, some of them, making heroic struggles to get entirely free from the photographic environments which encompass them. But I seriously doubt if one single picture is now ever painted in England which does not bear some trace of photographic influence. What that influence has wrought one cannot in all cases recognise; but, depend upon it, some indication (if not patent there latent), will be present. A man may bury himself in Newlyn, may refuse to see an illustrated journal, may taboo all pictures without exception as being poisonous, after all which he will perhaps paint some abnormality with, maybe, a strongly marked photographic foreground! I mean a foreground such as is yielded by a W. A. lens.

"The trail of the serpent is over them all;" no man who has consorted with his fellow art-students during the last thirty years but has caught the photographic taint, from this there is no escape.

However important it is for a painter to rid himself of the photographically diseased eye, all the more is it needful for those whose eyes are frequently used for arranging pictures on the ground glass to counteract the effect; this leads up to

Finger-post III.

For the foregoing reasons you should abstain from much gadding about at exhibitions of photographs; on the other hand, try and cultivate your faculties to see nature, not from the photographic point of view but from the æsthetic one. After what I have already said you will readily conclude that our exhibitions of modern paintings are of little use; need I add that the only training grounds left to us are the now more than ever precious works of the painters of the pre-photographic era? For a pure well of landscape undefiled you have the early English School, including Turner, David Cox, Constable, Bonington, and many another of similar calibre.

Fortunately figure-painters are even more lavishly available than their brothers of the landscape, but need not be here named.

Fourth Impression.

The time has arrived when we should make a well-marked distinction between *photographic achievement and the application of photography to various purposes.*

Amateurs are, many of them, quite weary of protesting against the adulteration of the photograph with the paint pot. It is now many years ago since I first anathematised the sending of prints which owe their effects to pencil and brush to Exhibitions that professed to display only *photographs*. It seemed to me then, as it does now, that the aim of the true and loyal photographer should be to show us what the lens and camera, the dry plate and developer are capable of, and therefore, by their sole aid, take down the words of Nature. That being done, do not, I say, proceed to forge her signature with your meddlesome fingers; moreover, if you must commit this sophistication, don't palm off the counterfeit as a coin of Nature's currency. Such a concoction may be a marvel of deception, which is perhaps, in most instances, the best that can be said for it, but it does not deserve the name of photograph.

That it is possible in these days of far-reaching photographic association to make such complaint is, in my estimation, mainly due to the systematic winking at faked photographs on the part of Judges and promoters of Exhibitions held for the encouragement of photography, and you may depend upon it that this loose and over-indulgent habit is exerting a most discouraging influence upon those who are striving to produce improved photographic renderings by strictly legitimate methods.

I am, of course, fully aware how unwise it would be to throw cold water upon the efforts of those others who build up on a photographic foundation all sorts of delightful illusions in the provinces of landscape and of the figure—illusions which we have all more or less admired.

But what I earnestly press for is, that a sharp, hard-and-fast line of demarcation should be drawn in all cases where photographic Exhibitions or competitions are held between the photograph and the "photo fake."

Here let me refer to a very curious distinction which I have before now heard amateurs make between meddling with a print and tampering with a negative. Inasmuch, say these, that any picture which is solely the production of light acting upon a sensitised medium is a photograph, therefore whatever may be done to a negative, the resulting picture being printed by light, and subsequently untouched, is a *true* photograph?

Perhaps it is, but so might a carbon print of a Sir Joshua Reynolds' portrait claim to be true. The weak point in the foregoing contention is that the print is not a true or truthful photographic *rescript from nature.*

Be that as it may, from my point of view, if any handwork be applied, the earlier this is done the more radical is the falsification, and therefore the more blameworthy the practice.

It seems exceedingly odd that our superfine amateurs should, for so many years past, have slung contemptuous epithets at the professional on account of his habit of beautifying all sitters by means of the retouching pencil, and yet that there should now arise a school of amateur fine-art landscape photographers, backed up by some of the Judges, who, quite out-heroding the wickedness of those who fabricate facial comeliness, coolly excuse themselves by claiming that anything is fair treatment for a negative so long as the print bears no added pigment.

They remind me of the doctrine attributed to the Spartans, who considered that thieving was absolutely blameless, but severely punished any one found out for his bungling. In my opinion exactly the reverse should hold good as regards photo-faking, the more you conceal the lie the greater the evil; hence I should hold that, if there be degrees of guilt, the working up of a print rather than of a negative is the minor transgression.

But, whether print or plate be doctored, I do hope you will all raise your voices against these bastard productions being allowed to batten upon the medals and walls meant for the truly begotten children of the camera.

It would be upon my part painful to particularise which prints recently shown at photographic Exhibitions are amongst the chief offenders. Probably most of those I am addressing have for themselves taken stock of the alarming prevalence of hybrid productions. If not, I dare say I could name several experts, one of whom, upon a future occasion, would be pleased enough to enter more fully into this portion of my paper.

Meanwhile the accompanying illustrations will indicate the nature and the extent of the hand work which may be present in so-called photographs.

You will clearly understand that, so far as I know, the illustrations I refer to have never been exhibited at any photographic Exhibition. I have purposely refrained from belling the cats; once upon a time I did so, and got small thanks for my trouble. To-day, let some other take his turn and hang the jingles around pussy's neck.

Figure 1 is from an untouched print, figure 2 is from the same which has been worked up by hand.

A moment's inspection will show how a somewhat uninspired and ather monotonous photograph has been turned into a tolerably ttractive picture. But you may at once object that the foregoing s an example of the touching up of a print and not of a negative. Quite so. At the same time you must bear in mind that in many n instance the above procedure is resorted to in order to produce, ot an exhibition print, but *the negative from which such picture is rinted.*

Thus, a plate being exposed, developed, and printed—preferably y enlargement—with due regard to the end in view, *i.e.*, that the inished print shall pass muster, and not be obtrusively "painty," the hotographer sets to work to invent details and effects, here heightning, there toning down, and generally bespattering the sun picture with his own fallible mannerisms. All which being accomplished, he may proceed to make a reduced negative of this patchwork, the which being obtained, a rough-surfaced printing paper is chosen, a ow-toned print is made, and the result is voted "*quite wonderful.*" And yet not only has the actual surface of the print received no morsel of paint or of pencil, but the negative itself will be absolutely untouched.

All this is most ingenious and, under most circumstances, highly praiseworthy, for it is a method of utilising the camera which has, without doubt, great possibilities; witness, for instance, the illustrations in the *Metropolitan*, in which photography and drawing are, with much adroitness, combined to manufacture illustrations which have a certain commercial value.

The London Stereoscopic Company have also lately published a series of *genre* studies which are free and, in some cases, admirable examples of mixed methods. To all such picture-makers there is due much credit for finding fresh outlets for photographic activity; but, while we encourage this co-operation of the draughtsman and the camerist, let us see that the amateur, who would be otherwise content to work in patience for his photographs to include a full measure of accuracy and a fair measure of art, by strictly photographic means, is not impelled to give up the struggle.

Finger-post IV.

Unless pure photography is to be utterly stamped out, more stringent Exhibition regulations and sterner Judges are wanted.

My Fifth Impression

is that your Society, in common, I hope, with many another, is performing most useful, and therefore excellent, work.

Let me give you an example or two of the value of such associations as yours. From time to time all sorts of photographic materials are put upon the market, all of which I need hardly say are in some way or another considered by their makers to be greatly superior to anything else of the kind. Sometimes the real case is just the reverse. Of course, one can always take counsel of the trade journals, but unfortunately they are all of them remarkably reticent regarding the shortcomings of newly manufactured goods, due, I suppose, to excess of caution, combined with an abundance of benevolence upon the part of the editors. With a Society such as I am addressing, fortunately, caution is usually absent, and benevolence, as regards manufacturers, quite microscopic; and so it befalls that various pretensions are quickly tested, and in most cases the real truth soon becomes generally known to members; and so, if a marvellous plate is brought out, the film of which won't keep on the glass, or if a stupendously fast emulsion claims to be twice as rapid as any other, but is in reality twice as slow, the experimentally inclined member soon finds it out.

Within a week of a certain quick, but cheap, plate being put on the market, we at Croydon had snap-shots *taken in pairs* with other plates of higher price, and as rapid as could be bought. It was found that the shilling plate was at least as rapid as the others.

Sometimes, too, societies are useful in overcoming the obstruction to progress always possible where vested interests are at stake. Thus, about six months ago, being greatly struck with the collodion printing paper, I read a communication at Croydon on the subject, in which I pointed out certain respects in which collodion paper was superior to gelatino-chloride paper, which last, I need hardly say, is now rapidly losing ground.

Directly my paper was printed in the journals, a band of more or less interested obstructionists, hounded on by the acrimonious "Cosmos," did their level best to smother the arguments and experiments I had adduced. These writers, for aught I know, may all be quite unconnected with any manufacturer; but it is none the less a fact that there are powerful trade organizations which, having large sums of money sunk in machinery and works for the manufacture of older fashions of printing paper, naturally look with unfriendly eyes upon innovations which make this plant obsolete.

As far as collodion paper is concerned, several of the societies have lately taken it up. Thus, Mr. Shaw, of the Manchester Amateur Photographic Society, not long since travelled over the ground I had previously covered, and quite endorsed my conclusions, as his paper published in the *Photographic Record* witnesses. Several professionals have also, during the past few months, given us the benefits of their experiences, which are decidedly in favour of collodion as against gelatine. Those interested would do well to refer to an article on the subject in the November number of the *Photogram*, by Harold Baker, and also to The British Journal of Photography for October 18, in the leading article of which you will find a warm, although somewhat tardy, eulogium of collodio-chloride paper. This is very satisfactory, but I feel sure that, if it were not for the fact that there are a large number of societies which, as it were, force the hands of editors and others, the appreciation of collodion paper would have been very much delayed.

I have not come down here to speak up for this paper, so will say no more on the topic of its merits; perhaps, however, it may interest some of you who work the ordinary platinotype black paper to see some samples of matt-collodion paper, toned with the gold and platinum bath, by Mr. Harry Letts, a member of the Croydon Camera Club. I will only say this more, that many will find the rapidity, certainty, and evenness of toning with collodion paper are very agreeable points, which differentiate it from certain other kinds of printing papers. And now I come to

Finger-post V., and Last,

which is, that you should all for your own, each other's, and photography's benefit do what you can to keep alive local interest in your Society.

You are unusually fortunate in having upon your roll of members the names of several amateurs whose pictures and phrases command respect and attention throughout the photographic community; above all, you have a President whom, I feel, all provincial societies covet; and, judging by the programme of fixtures, you possess a Secretary and Committee which are unusually capable not only of forecasting your needs, but in supplying them. Such an organization deserves to prosper.

But, after all, no such Society can live an active and healthy life unless most of its members take personal part and interest in its affairs, and thereby back up the executive in their honorary labours. There are many ways in which this *esprit de corps* may be kept alive, and I do not propose to-night to exhaust the alternatives. But I will, as my concluding observation, say that one of the most powerful influences is the holding of an Exhibition. We all remember that, several years ago, Richmond, before your Society was founded, rather astonished us by the importance and significance of the photographic Exhibition it held. I do not suggest that you should endeavour to equal or beat this Richmond record, neither do I counsel you to do less, but have *some Exhibition*, one as good as you can arrange. And remember that what I have earlier said respecting the value to you of studying photography at our leading displays by no means applies to your townsfolk, who are not photographers, or, if so, are merely idle dabblers.

To these, many of whom have never even heard of the Salon or the Royal, a local Exhibition is an astonishing reminder, and a certain proportion of those who see it are sure to be thereby induced to take up the practice of photography as an elevating recreation, and ultimately join your Society.

One last piece of advice. In holding such an Exhibition I would counsel that you do not be led away by the critics in the technical journals to try and rival the London displays as regards new productions. Let what is not your own work be, as far as possible, the picked pictures of our leaders, and, providing such have not been already publicly shown at Richmond, let Novelty wait upon Perfection.

Hector Maclean, F.G.S., F.R.P.S.

CARBON JOTTINGS.*

As we have not yet considered the drawbacks to carbon printing, we might now just touch on a few of them.

Take blisters, for instance, which apparently do not confine themselves to this process. It has been my business, ever since I started photography some seven or eight years ago, to read the *Amateur Photographer* weekly. During that time I should not like to say, or hint at the number of letters and articles I have read *re* blisters on albumenised paper. But, strange to say, during the whole of that period, I do not think I have ever seen a blister on a silver print; at least, I cannot call one to mind. I regret to say that I cannot

* Concluded from page 743.

say the same of carbon. Of course, in this case, there is no need to trouble the *Amateur Photographer* editor on the subject, as the cause is well known and the symptoms are only too apparent. But still they come.

Should you, as you doubtless will, after hearing this paper, resolve to give the process a trial, I can guarantee to promise you as good a crop of blisters as you ever saw in your life. I could also promise you that, with ordinary care, you should not have a single one. Should you require them, my advice would be as follows: Get from the Autotype Company the tissue, and also (and mind, this is the important part) some of their prepared roughest Whatman paper. Follow out the instructions to the letter, and I will still guarantee blisters by the hundred—well, no, not by the hundred perhaps, but it will occasionally be one only; but that one may possibly include half a print.

Should you not want them, I should say, with the tissue get some of the prepared etching paper, and with reasonable care you will never see one blister.

The cause I cannot tell, the effect I know too well. I have not used much of the very rough Whatman, for this reason; but I have brought with me, this evening, one or two specimens which managed to escape the infection, or have managed to get rid of the effects. And this brings me to another point in favour of carbon, and that is the easy way in which they can be retouched.

I have one or two 12 × 10 enlarged negatives, which, if judged by looking through them, would have been thrown away after fixing, and yet these same negatives give very good and apparently perfect prints. No matter how many spots appear on the negative, so long as they print out white, they can be obliterated by the careful use of the pencil or brush. One print I have in which half the sail of a barge was lost through the bursting of a blister, but the pencil filled it up so completely, that, unless looked at sideways to the light, the defect was hardly visible. Another case was when a very good sky was spoilt by a perfect nest of small blisters. Each one was carefully gone over with the pencil, until when looked at from a short distance not one flaw could be detected. It takes time, of course, but one is apt to be more careful with plates that cost 19*s.* a dozen than with the humble quarter. And it is with large plates that I more especially use carbon. By making an enlarged reversed negative I am much more certain of getting a good result than with direct enlargement on to bromide paper, and also a more permanent one.

Another defect in the carbon process is washing up of the tissue at the edges. It is to prevent this that the safe-edge is used. I have occasionally printed without a safe-edge, but it is only safe to do so when there are no deep shadows at the edges of the picture. Where there is a thick deposit of tissue at the edges, without a safe-edge the pigmented tissue would stand up like a cliff, and the water would act against this much as it does against the seashore. By the use of a safe-edge, removed a slight distance from the film, the light act sideways through the glass, and the upright wall is converted (to use my previous example) into a shelving beach, which will resist the action of the water.

There are other defects met with occasionally, at least so we are told by writers on the subject, but as I have not as yet come across them; for their cure I will recommend you to study the Autotype Company's guide, a very interesting book.

One thing I will refer to, though, as I have come across it once. After the paper has been kept about a fortnight, it will perhaps be found difficult to strip. Should this be so, take a small strip of the paper, and place it in nearly boiling water, and, if it is still insoluble, you may safely throw the rest away, as it is useless. In damp weather, unless kept under pressure, this may occur in a less time, but, as a rule, it will keep quite a fortnight. Should it, with difficulty, have stripped all right, but does not develop easily, a good plan is to put a few drops of ammonia in the water, and the same holds good in a case of over-exposure. I have saved several prints by its use, when even boiling water would not reduce the amount of pigment. Care must be used to add the ammonia in small quantities at a time; otherwise, if too strong, it may wash the whole picture off. I once saw the bough of a tree taken clean off in this way, in the picture, of course; but, by the use of a few drops of a ten per cent. solution in, say, twenty ounces of hot water, the action takes place slowly, and a return to hotter water will finish it off.

The prints may be finished off in two ways. By the use of a mask, a wide margin may be left, and the prints will require no trimming or mounting. This gives a very finished appearance when properly masked; but, should the mask have slipped, or not have been put on the negative straight, then, of course, the lines would be out and give a drunken appearance. Or, in the case of water, it would have the appearance of going up hill, which would not improve its appearance from an artistic point of view. The other fault is the one I referred to earlier, viz., when the mask is not cut rectangular. In the case of this happening, it can only be cured by cutting off the margins and retrimming. In so doing, we make use of the second method of finishing off the print, transfer on to paper only slightly larger than the size of tissue used, and then trim and mount in the usual way. This is, after all, more satisfactory, as any portion of the negative can be made use of, and unnecessary portions of the picture removed. The trouble and difficulty of making masks for each negative is so great that I do not think it worth it.

And now I should like to say a word or two about the apparatus required for carbon work. In the *Autotype Manual* you will find a price-list of the different articles required. For quarter-plate work the price given is 2*l.* 15*s.* 8*d.*; for half-plate, 3*l.* 12*s.* 5*d.*; and whole-plate, 4*l.* 8*s.* 8*d.* Now, this alone is enough to keep many of us from working the process on the score of economy; but, after some experience, I can assure you that you may safely strike out at least three parts of these estimates as quite unnecessary, and I think the Company would have done much more good to themselves if they had omitted them altogether. Take the different items separately—mounting tray and developing tank, three trays for cold water and deep porcelain dish for alum, two autotype pressure tissue boxes, thermometer, squeegee, and squeegee board. These are the first items, which amount to 1*l.* 11*s.* 3*d.* for quarter, 2*l.* 6*s.* for half, and 2*l.* 18*s.* 9*d.* for whole-plate. Well, of these I should immediately strike out all except the squeegee, which costs 2*s.* 6*d.* for whole-plate, and will do equally well for all sizes. For the stout tin mounting tray I use my ordinary porcelain fixing dish, or, if too small, then an ordinary washhand basin. For the stout tin developing tank I use the same. For the three zinc washing trays I use my usual trays, and do likewise for the alum dish. For the autotype pressure boxes, I find that a pile of negative boxes give ample pressure, as will be found out in trying to lift them. For the thermometer, I use my hands, and find them fairly sensitive when put into water that registers over 100° by the thermometer. And, lastly, for the squeegee board, I simply turn the mounting tray upside down, and find it acts very well. The next item is 5*s.* for an actinometer, which is necessary, but any one with a fair amount of ingenuity and a knowledge of what is required could easily make one for one quarter of the price. Then come American clips, 1*s.*; bibulous boards, 1*s.*; French chalk for glass plates, 6*d.* Ordinary blotting-paper can be used instead of the bibulous boards; the clips I never use, and the French chalk will probably be in stock for other purposes. Then come three dozen packets of tissue—1*s.* 3*d.*, 2*s.* 6*d.*, and 4*s.* 6*d.* respectively. One dozen is as much as one should buy at a time, unless going in for wholesale printing. Then come the temporary and final supports and waxing solution for temporary supports. These, of course, are necessary, but will last a long while; in fact, the celluloid temporary supports will last indefinitely. Then come five ounces of transfer collodion, one yard of cotton flannel, bottle of black varnish and brush for ditto. The collodion I have never seen, an old handkerchief does for the yard of flannel, and lantern-slide binding or brown paper for the varnish, and the tongue for the brush. The last two articles are a "Hero" kerosene oil stove, 7*s.* 6*d.*; and iron trestles for supporting the developing tank over the stove, 3*s.* 6*d.* I use the hot-water tap in the bath-room instead of the oil stove, and, if that was not available, should think a 1*s.* methylated spirit lamp quite suitable, including the trestles. We shall now find that for quarter-plates our estimate would be 9*s.* 5*d.*, instead of 2*l.* 15*s.* 8*d.*; for half-plate, 10*s.* 7*d.*, instead of 3*l.* 12*s.* 5*d.*; and for whole-plate, 12*s.* 3*d.*, instead of 4*l.* 8*s.* 8*d.* I think, therefore, that you will agree with me that the Company do themselves some harm by putting down such estimates as these, which many readers might think absolutely necessary.

One other point and I will close these Jottings. Many of you may have heard that the working of this process is dangerous to health, owing to the injurious effects of bichromate on the skin. I can only say that, though I have developed a dozen prints at a time and have had my hands in both the hot and cold solutions for perhaps an hour at a stretch, I have never yet felt the slightest ill effects from so doing.

No doubt, it is a fact that some professional workers have suffered severely from what is known as the bichromate disease, but their plan of working is so different to the amateurs' that we need have no fears on the subject. In using hot water from the hot-water tap, as I have recommended, the water requires replenishing so often that it never gets saturated with the acid, and fresh water is used for each print. By using the special apparatus as recommended by the company, and keeping it up to a certain temperature by means of a stove, after developing about a dozen prints, the water must become so

saturated with acid that it is little wonder if serious danger is caused to the skin, and, should there be any cut or abrasion, it is more than likely that sores would result. I can only say, "Don't let this fear prevent you from trying the process," but, should you find it hurtful to the skin, immediately drop it, or use indiarubber gloves for development. I always make a point of well washing my hands after work, and this may perhaps have had some counteracting effect.

Before closing my jottings and showing you some of the results of my amateurish efforts, I can only regret the very poor way in which I have brought this charming process to your notice, and much regret that the shortness of the notice given me has not allowed me to clothe my ideas in more poetical language, and to marshal my facts in better array.

I should also have much liked to have given you a visible demonstration of the simplicity of the process, but the difficulties in the way were too great, owing partly to the weather and partly to the want of the necessary facilities. But, perhaps, on some future occasion, when we feel more at home in our new quarters, an opportunity may be given me to so demonstrate. So far, I can only consider that I have but very poorly described the details of a process that only wants trying to show its simplicity and its adaptability for the artistic rendering of certain subjects.

A poor negative will not give a perfect picture even in carbon, but a good negative will often not show all its beauties on white paper or glazed surfaces. Print it on the etching paper as sold by the Autotype Company, and though ignorant editors may think it looks like "the crust of a slacked-baked apple pie," and "is of equal value with the strawboard on which it is mounted," you yourself may feel that a more artistic rendering is given to the view taken, and that, though the crust may be overdone, yet there will still be something left that will be enjoyed by more artistic judges.

LESLIE SELBY.

"A BLIND LEADER OF THE BLIND." *

FOR all that has been written about the art claims of photography, it may not be unprofitable to take yet another glance at the position of affairs if only to supply some of our less thinking readers a weapon of defence when met by the thrust which custom has put into the hands of the average man, who says of any photograph you show him, as soon as he has ascertained that it is a photograph from nature, "Very pretty; but, of course, your photography can never be an art."

"Of course!" "Of course!" the dogmatic, prejudiced, utterance of the man, who has never perhaps given the matter five minutes' consideration, and could not give any reasons for such opinion beyond the statement, "The camera produces the photograph, but the artist produces the painting."

There it is—the chief factor, if it were but recognised, is omitted in his calculation, *the photographer* is not reckoned.

Nor can we blame such. It is only very recently that the photographer has apparently shown any particular interest in his work, certainly it is only recently that he has attempted to establish his own importance in connexion with his productions.

If we would patiently and seriously endeavour to judge the real extent of this "gulf," which is said to exist, we must consider the things so separated in all lights, and the following would seem to me a fair reasoning.

On the one hand we have a representation of certain objects, and appearances made by means of appliances known as photographic; on the other hand we have the production of forms which, because they represent familiar objects, suggest ideas or impressions, and these are produced by some one who is skilled in the use of such tools as brushes, pencils, &c.

Of course, the ready contention always is, that the photographer is limited to the representation of objects actually before him, and exactly as those objects appear at the precise moment of photographing them, whereas the painter may build upon the suggestions of Nature such representations as his imagination may create.

This contention is based upon an utter ignorance of the capabilities and powers of photography.

If, indeed, the photographer were in reality bound down to the representing of things as they appear at a given moment, then, verily would any attempt to establish the art claims of photography be futile, and the full measure of the critic's condemnation be well merited; but, I would unhesitatingly claim that, theoretically at least, the photographer is as able to produce, by purely and legitimate photographic means, the effects, nay, even the forms which, irrespective of fact, he may think desirable, granted it would require great skill, patience, time; but what of that?

If it is possible to conceive the photographer as able by his photography to so far modify the photographic image as to actually alter forms and arrangements of masses, shall we not, to some great extent, be investing him with creative powers? and, if it be advanced that he can only do this "up to a certain extent," I would ask, Who will be bold enough to define that "certain extent," or determine the barrier of limitation?

It will be said alteration is not creation, and, in the fullest sense of the word, such must, of course, be granted; and, in the present condition of photographic practice, I am not for a moment going to claim for it an equality with other graphic arts in the matter of creative powers. One might press the argument to an extreme by saying that, after all, if the controlled and altered photographic image is founded upon a mere mechanical copy, so also the painting is founded upon preliminary studies, or sketches, or memories, which are copies of the actual existing. But I would not attempt, at present, to press the comparison so far, but would be well content if I could but make the uninitiated understand that there are those who practise photography who hold that a photograph, be it never so perfect in production, perfect in composition (that is, selection of subject), possessing everything that judgment and good taste can contribute, as regards lighting, focussing, &c., is a photograph in a mechanical sense still! It may be a nobler and better thing than newspaper critics ever dreamed of, but the limited amount of control possible, in the production of a negative plate, does not sufficiently emancipate it from the character of a machine-made thing, a mechanical production; but it is when the photographer, holding this plate, or a simple print therefrom, in the light of a first study or sketch, and upon that allows his imagination to play, until he suppresses this light object and elevates that darker one, merges these or those lighter portions into the adjoining region of shadow, it is then that the photographer begins to exercise his art privileges and creates.

And all this can be done, *and is done*, by purely photographic means.

Note the painter before his canvas on which is a completed sketch of some scene; to the average spectator it appears a perfectly finished picture, and yet the painter continues working upon it, toning down here, strengthening there, feeling his way, as it were, to more subtle effects.

It is work of this kind that is well within the power of the photographer, and, in proportion as he exercises this power, so will he help to bridge the "great gulf" which, it is said, divides him from pictorial art. For my part, I would no more think of publishing or exhibiting as a picture a photographic print, just as the negative and the sunlight left it, than I suppose the artist (whether literary, graphic, or anything else) would part with a serious piece of work without thinking over it, bestowing a touch here and there, before sending it out into the world; but let me say I am not now referring to "faking" the photograph with brushwork.

Without being able to give actual illustrations it is not easy to make it very clear to my readers the great amount of power which the photographer may exercise in making the print, but it is by no means inconceivable that a print from a negative of a landscape under a clondless sky might, with judicious handling and by no more intricate process than simply sunning down, be converted into a scene of totally different lighting (different in general character; not, of course, in direction); shaded down in parts more or less according to one's pleasure, preserving and concentrating light on particular portions. No one who has not put such a means into actual and most careful practice can fully understand how great the power, or how striking the alteration effected—and it is just such methods of voluntary reconstruction, rightfully employed, which shall lift photography furthest out of its mechanical limitations.

Now, in the hysterical criticism of modern pictorial photography to which reference has in the foregoing been made, and in similar writings before and since, it is not so much the actual pictures shown that are criticised and condemned for this or that fault as that they are condemned because of the process or methods by which they are supposed to have been produced; it is as much as to say, They are photographs, therefore mechanical productions, and again, therefore, cannot be art.

I want to insist that photographs need not, nay, as pictures, should not, be mechanically produced, and the said critics, being convinced of this, may be less sweeping and hasty in their judgment, or at least they will be deprived of their chief weapon.

On all hands, amongst pictorial workers, the effort is being made to place in the hands of the photographer more power of control over the image, and with present knowledge it is quite impossible to

* Concluded from page 742.

say what in a little time the photographer will, or will not, be able to do. But, supposing such powers become unlimited, what will be the result? Who are the photographers who will be able to wield them? How much of the success attained by many a photographer is due to the blind, yet faultless, action of his appliances? How much, indeed, how very much? and the unfriendly reviewer of photography's higher and better attainments takes advantage of, and judges all according to the faults of some.

The true art qualities in a photograph are those which are due to the introduction of something wilfully by the photographer, and the photograph *may even be less pleasing to the public, less truthful to nature, and at the same time be more a work of art* if some of its effects, some of its suggestions, are deliberately produced by the will of the artist operator. Look round at the exhibitions of refined, intelligent photographic productions, and in how few can one feel t at beyond the selection, the choice of lighting, the suppression of excessive detail, and such, the result has been restrained, helped, or altered by the artist mind or hand.

The fault is this, the photographer is too easily satisfied; his photograph is devoid of anything which he can call a distinct error, and so he leaves it, and is well pleased that he and his machine have turned out so clever a piece of work. No, not quite so; methinks *he* usually takes all the credit, and ignores the important part played by the humble machine. He fails to understand how a correct and tasteful representation of nature can be improved upon. He says, or thinks, "It is just exactly true to the effect I saw," and rejoices that he has so far guided the process to this end, when it might easily have gone astray and failed to give the effect desired. But this is not enough. I would rather have the photograph *not* just exactly as the scene was, *but as the artist would have liked it to be, or imagined it might be*, and by purely photographic means I maintain he could make it so, or at least to a great extent.

Now, then, it is not photography that cannot be art, it is that *photographers* are not usually *artists*. They lack imagination, they are deficient in perception, they see no need to create, and hence never exert themselves to attempt it; little wonder, then, that a good deal of the most tasteful photographic work still reeks of mechanism, and is barren of higher artistic quality. Given that photographers were first artists who had striven towards using light as one might use a pencil, photography as a pictorial method had never fallen under the same amount of intolerant contempt as it has done; but this is no excuse why those who constitute themselves its judges should fail to investigate to the uttermost, should shut their ears to half the evidence, should make themselves blindfold, and cry aloud, "There is no sunlight" deceiving the sightless, "Blind leaders of the blind!" And there are none so blind as those that *will not* see.

A. Horsley Hinton.

PHOTOGRAPHERS' COPYRIGHT UNION ANNUAL MEETING.

On Friday last, November 22, the Annual Meeting of the Photographers' Copyright Union was held at St. James's Hall, Piccadilly. Mr. Frank Bishop (President of the Union) took the chair, and he was supported by Mr. J. J. Elliott (Vice-President) and the following members of the Committee: Mr. William Grove (Window & Grove), Mr. W. Downey (W. & D. Downey), Mr. Alfred Ellis, Mr. E. Frith (Frith & Co.), Mr. J. Lillie Mitchell (London Stereoscopic Company, Lim.), Mr. Louis Wilson (G. W. Wilson & Co., Aberdeen). Among the members present were Mr. H. S. Mendelssohn, Rev. F. C. Lambert, Mr. F. Turner, Count Ostrorog, Mr. H. H. H. Cameron, Mr. H. N. King, Mr. Arthur Weston, Mr. T. Fall, Mr. F. F. Weeks, Mr. F. G. O. Stuart (Southampton), Mr. R. W. Robinson, Mr. Elliott, junr., Mr. Howell (Solicitor), and many others to the number of about sixty.

The President read the following Report:—

1. In presenting the first Report of the Photographers' Copyright Union since its formation upwards of two years ago, your Committee do so with a feeling of considerable satisfaction, as in the experience gained during that time the Union has more than justified its existence.

2. It will be remembered that the inaugural meeting took place in this same room on January 9, 1894, as a result of a series of conferences which had been previously held by those most directly interested in Photographic Copyrights. At this meeting a Committee was nominated to organize and carry on the work of the Union, to draw up a set of rules for the guidance of the members, and to formulate the principles upon which the difficulties besetting photographers on the question of copyright should be dealt with. This was no easy task, but your Committee have at least the satisfaction of knowing that not only have the Rules which they made proved to be workable and useful, but these also have been adopted as the basis upon which two important Unions in France and America have been founded, of which mention will be made later on.

3. After fully considering the responsible position in which they had been placed, your Committee resolved that the leading feature of this amalgamation of photographers should be the mutual protection of the members' interests. For many years it had been customary for each photographer and photographic publisher to act entirely on his own account with regard to his publications, and thereby the unfortunate practice sprang up of allowing these to be indiscriminately copied under the impression that he was amply remunerated by the mention that "this picture is reproduced from a photograph by So-and-So." Possibly in the past, when there was a likelihood of selling thousands of a publication, this mere announcement was of sufficient value; but ultimately it was found that this gratuitous permission to copy brought no tangible benefit to the producer, and, although publicity is always desirable and to be valued, the competition thus raised between the enormous circulation of the illustrated press and the photographer's more limited opportunities of satisfying public requirements in the matter of photographs of interest soon showed itself to be to the entire disadvantage of the photographer, and that the custom of allowing the results of his technical skill, energy, and artistic ability to be reproduced for nothing was a commercial blunder and a loss. No artist, author, or designer, has ever found that he could live upon the publicity given to his name only, which is all the photographer had hitherto claimed from the user of his copyrights.

4. Your Committee therefore considered that one of the first principles upon which the Union should be established was that every member should agree to charge for the use of his copyright subjects on every occasion they were reproduced. Considering the enormous field which is open to the producer of good photographs, which are daily becoming more and more adopted by our most advanced advertisers, railway and shipping industries, manufacturers of every class of goods, the illustrated press and magazine publishers, lithographers, publishers of popular *souvenirs* of tourist resorts, Christmas-card publishers, and others, it was evident that the photographic profession were not alive to the value of their productions.

5. At the same time, having in view the amicable relations which existed between many of the leading photographers and the users of their copyrights, it was considered desirable that a very low minimum fee for reproduction should be established as a condition of membership, leaving each member at liberty to make such higher charge as he considered the value of his productions warranted. The minimum of one guinea was suggested and subsequently adopted as the lowest charge for which any picture of cabinet size should be allowed to be reproduced; but, upon the representation of some of the most active leading editors of the illustrated press, it was agreed to lower the minimum to 10*s* 6*d*. for a cabinet photograph. This became, practically, the active principle upon which the rules of the Union are built, and in its amended form the Committee are gratified to note that the majority of the users of copyrights considered that the photographers were perfectly justified in the course they had taken, and amicably accepted the new arrangement.

6. The professional photographers were then circularised, with the result that over a thousand of the principal photographers throughout the United Kingdom gave their signed adherence to the principles of the Union, and guaranteed to abide by its rules. The Committee originally appointed consisted of those whose interests were very largely concerned in maintaining the integrity of the rights of the photographic profession, namely, Mr. Frank Bishop, of Marion & Co.; Mr. Joseph J. Elliott, of Elliott & Fry; Mr. Alfred Ellis; Mr. Downey, of W. & D. Downey; Mr. Grove, of Window & Grove; and Mr. J. Lillie Mitchell, of the London Stereoscopic Company, and the object of our meeting to-night, after a period of over two years' practical experience of the rules and principles originally formulated, is to give some account of how the different resolutions have worked in practice, and of the results achieved.

7. Shortly after the formation of the Union, the members of the Committee, being all members of the Photographic Section of the London Chamber of Commerce, thought it desirable that the weight and prestige of that powerful body should be brought to bear to strengthen their position, and it is satisfactory to note that, through the courtesy of the officials, the Union is now an affiliated and official Section of the Chamber.

8. As this report extends over the working of two years, there have been, naturally, many matters of interest which have come before your Committee during that period, and it is satisfactory to be able to report that in the practical results of the working of the Union their expectations have been fully realised. It is undesirable, in a public meeting of this character, that the actual monetary figures resulting from the principles upon which they have proceeded should be disclosed, but the whole of the details are before your Committee, and they can personally vouch for the extremely handsome results which have accrued to both London and country members. Very large sums indeed have been obtained in the ordinary course of business as the result of members charging the minimum or higher fees for the use of their subjects; and the Committee would here like to express their extreme satisfaction at the courteous and reasonable manner in which the majority of the illustrated press and publishers have met the demands made upon them for the use of photographic subjects. From the business point of view it has been found that the photographer furnishes a useful class of illustrative material at a less expense, and possessing much greater technical accuracy, than can be obtained from sketches or drawings.

9. It is to be regretted that there are a number of cases on record in which the photographers' *bonâ-fide* rights have been ignored, and which have necessitated legal action on behalf of the members through the Union's Solicitors. In the majority of instances large sums have been recovered without the necessity of going into Court. In others, where it was necessary that legal action should be taken under the auspices of the Union (reports of which have duly appeared in the daily and photographic press), the results have been in each case in favour of the members, their rights being entirely vindicated and substantial penalties and damages obtained. Your Committee would point out that, through the experience of the Union's Solicitors as specialists in the question of copyright, much benefit has arisen to the members without having to resort to the expense of legal procedure.

10. The Union, originally started amongst portrait photographers, has now been greatly strengthened by the adhesion of the principal photographic-view publishers, and at a special meeting, called by themselves in their own interests at the Manchester Hotel, London, signal recognition of the importance of our Society was made by the fact that all present—over thirty in number—decided to join the Union in a body, and agreed unanimously to recommend that at the first General Meeting Rule 23 be amended to read 10*s*. 6*d*

instead of 5*s*. As the result of this meeting two representatives of the view-publishing interest were proposed as members of the Committee, namely, Mr. Wilson, of Aberdeen, and Mr. Frith, of Reigate, and were duly elected. Subsequently, in the interests of the provincial portrait photographers, the well-known Mr. Lafayette, of Dublin, was appointed, and consented to act in the same capacity.

11. It is a source of great satisfaction to know that the principles and influence of the Union have been largely recognised by others not immediately connected with photography as a business, and, upon the representation of a number of influential amateur photographers, it has been decided that amateurs shall now be freely eligible as members of the Union, all that is asked of them being that they will support its principles, and that they shall not give their artistic photographs for reproduction for less than the minimum fee which has been fixed.

12. Your Committee are further able to report that, acting upon the initiative taken by this Union, a powerful Society has been organized in America, which has adopted the principles laid down in our Rules, and agreed to work with us in maintaining and looking after the mutual interests of photographers in both countries. And still further, through the action of two members of the Committee, a special meeting was called lately in Paris of the leading Parisian photographers, at which a full translation of the Rules and principles of this Union was submitted, and an agreement was there entered into and signed by those present that a Union, on the same basis, would immediately be organized in France for the protection of photographers' copyrights, there and in other countries. Your Committee are advised that following this meeting a powerful organization has been formed under the auspices of La Chambre Syndicale, which is a Government institution, under the control of the Minister of Commerce.

13. Your Committee are so satisfied with the working of the Photographers' Copyright Union during the past two years, and the benefit derived from it, that they now propose, in order to extend its influence, that the membership fee of 10*s*. 6*d*., hitherto required, shall be abolished, the only condition of membership now being that an undertaking to abide by the Rules be signed, whereby the member agrees that he will not allow any of his photographs to be reproduced for a less payment than 10*s*. 6*d*. For the forthcoming year, at least, the Committee themselves, supported by any voluntary donations which may be made, undertake to meet all the working expenses of the Union. In view of the increasing business, they have decided to meet more frequently—not less than once a month—and, as usual, special cases will receive the immediate attention of the Secretary and Committee, as provided by the Rules.

14. Your Committee take the opportunity of thanking those who have so liberally contributed to the reserve fund, the donors including not only photographers but those engaged in supplying photographic material; and, as will be seen from the Treasurer's report, it is gratifying to find that this fund remains intact, and that all the expenses of the Society have been met out of the membership subscriptions.

The report went on to say:—

In accordance with the Rules of the Union, and in conformity with the suggestions in the Committee's Report, it will be necessary that members agree to modifications of the Rules necessitated by the proposed abolition of the Membership Fee, &c. The following are the amendments referred to:—

Rule 1 to read: The name of the Society shall be the "Photographic Copyright Union."

Rule 4 to read: Photographers who shall have given their signed adherence to the Union shall be considered duly elected, and all professional and amateur photographers and photographic publishers shall be qualified to become Members of the Union provided they be introduced by a member.

Rule 5 to read: That there be a Donation Fund.

Rule 6 to read: There shall be no Annual Subscription.

Rule 7 to read: The working expenses of the Union shall be met by voluntary donations.

Rule 13 to read: The Committee shall meet monthly on the first Wednesday in each month.

Rule 23 to read: That each member shall not allow a copyright picture belonging to him to be reproduced (whether registered or not) for a less fee than 10*s*. 6*d*. for a portrait, and 10*s*. 6*d*. for a view, but he is at liberty to charge a larger fee according to his own ideas as to its value.

Prior to discussing the amendments in detail, Mr. Mendelssohn voted that the report be approved, which was seconded by Mr. Stuart, of Southampton, and unanimously carried.

The Chairman then put the amendments to the meeting *seriatim*, beginning with Rule 6, as it affected all the other proposals. Mr. Weston, of Newgate-street, proposed the amendment, and promised a subscription of 10*l*. to the funds. It was seconded by Mr. Mendelssohn. Mr. R. W. Robinson suggested that the subscription should still remain in force. Mr. Weston spoke as to the moral support which it was desired should be obtained from the amateur and professional photographer. Mr. E. J. Wall, of the *Amateur Photographer*, approved highly of the suggestion to abolish the fee, and of the intention to admit amateurs to the Union. The Chairman asked that only members should vote on these amendments to Rules, and, on taking a show of hands, thirteen voted for the amendment and three against, the Committee not voting.

The other amendments were then dealt with.

Rule 1, proposed by Mr. Stuart, seconded by Mr. H. H. Cameron, approved unanimously.

Rule 3, proposed by Mr. H. H. Cameron, seconded by Mr. Robinson, approved unanimously.

Rule 5, proposed by Mr. Stuart, seconded by Count Ostrorog (Mr. Walery). Mr. Weston, of Newgate-street, strongly urged upon friends to assist by donations to the working expenses of the Society. The amendment was carried unanimously.

Rule 7 was put to the meeting by the Chairman without proposer or seconder, and passed unanimously.

Rule 13 ditto.

Rule 23, proposed by Mr. Mendelssohn, who stipulated that the fee should be for one reproduction only. Mr. H. H. Cameron desired that the rule should cover not only portraits and views, but also photographs of works of art. Mr. Robinson, Mr. King, Mr. Stuart, and Mr. Mitchell spoke in favour of the proposed alterations. Mr. Howell explained the legal points to be observed in granting the use of copyrights. Mr. Frith, on behalf of the landscape photographers, advocated the amendment that 10*s*. 6*d*. be the charge for a view instead of 5*s*. It was put to the meeting to read: "That no member shall allow a copyright photograph belonging to him to be copied whether registered or not, for a less fee than 10*s*. 6*d*. on each occasion, and for each different publication, or form in which it is used; but, he shall be at liberty to charge a higher fee according to his own idea of its value." The motion was seconded by Mr. Walery, and unanimously carried.

The Chairman then read letters of apology from Mr. H. P. Robinson, of Tunbridge Wells, Mr. Lafayette, of Dublin, Mr. Maskell, of the Salon, and about thirty others.

The Chairman read the Treasurer's report, which has already been published and circulated, and requested the meeting to appoint Auditors who would examine and vouch for the Treasurer's accounts. The meeting appointed Mr. H. H. Cameron, of Mortimer-street, and Mr. Thomas Bedding, of The British Journal of Photography.

A letter was read from Mr. Ernest Lambert, of Messrs. Lambert & Lambert, Bath, and the suggestion therein that members should be supplied with printed slips which they could enclose to publishers, who might request permission to copy their works, stating that they were members of the Union, and must adhere to its principles, was discussed and approved.

The Chairman, in reference to the results of his meeting with the French photographic publishers in Paris, called upon Mr. Joseph J. Elliott to detail his further work on the occasion of that visit, and much interesting information as to the organization of a Parisian Photographic Union was given.

A vote of thanks to the Chairman, Vice-Chairman, and Committee for their continuous labour on behalf of the Union for the last two years was proposed by Mr. Walery, and seconded by Mr. Downey, sen., and further spoken to by Mr. Weston and Mr. Mendelssohn, and heartily endorsed by all present.

Visitors present were invited to give in their adherence by signing membership application forms, and a very large number did so, at the same time promising voluntary donations to the funds.

EXHIBITION OF THE PHOTOGRAPHIC SECTION OF THE STANLEY SHOW.

It is too late now to enter into an inquiry as to the special connexion between photography and cycling. The Stanley Cycling Club, under whose auspices a marvellous collection of cycles and things connected therewith is brought together annually at the Agricultural Hall, seems to have discovered some such connexion, and for some years past the Photographic Section, which includes an exhibition of pictures and a display of apparatus, &c., has been not the least interesting feature of the show. It is to be regretted that the authorities could not see their way to allot to the section a more suitable position than the cheerless annexe in which the Exhibition is held. There were eight classes. The Judges were Messrs. B. Alfieri, Horsley Hinton, and Rev. F. C. Lambert, and their awards, except in one or two cases, where they appear to have given way to the eccentricity of their genus, strike us as having been well placed. The ample wall space allows the pictures to be seen to the best advantage.

Class A (Landscape and Seascape).—The gold medal is awarded to Mr. H. Esler, who has produced a picture in *A Grey Day* from very simple materials. The principal object is a birch-tree in its winter bareness, and the background, a belt of trees, appears in the mist almost to merge into the sky. The ground is sprinkled with snow, but not thickly enough to hide its raggedness, and serving rather to accentuate the path which forms the principal line in the picture. The print is in black platinotype, admirably suited to the subject. Rev. A. H. Blake's *A Grey Day by the River* is certainly a more interesting subject than that for which he has just received a medal at Hackney, and a better picture. The horizon line, cutting the picture exactly into halves horizontally, is an unfortunate mistake, and some posts, which mark the point through which a line dividing the picture vertically would pass, might be judiciously lightened on the negative. This picture is awarded the silver medal. For *A Dream of the Sea* Mr. W. Norrie has chosen a pretty and most appropriate title. An open expanse of sea, which, but for a streak of light on the horizon, would have merged into the clouds, a few boats, almost specks, which serve to relieve the monotony, and a sunset sky, with clouds, fantastic in form, and not, as is too often the case in sunset effects, too black and sombre. The print itself we cannot commend, its tone is horrid. Mr. Norrie receives the bronze medal. There are many other pictures in the class about which we

should like to say a few words in commendation or otherwise, but pressure upon our space compels us to be brief.

In Class B (Hand-camera Work) we found many pleasing little testimonies to the value of the hand camera in competent hands. Although there is much to admire in Mr. W. Thomas's *Off Scarborough*, which receives the gold medal, we cannot quite realise that, even in the dim light there represented, the sails and hulls of the vessels could have been so wanting in detail. That the land which forms the background should have appeared a quiet mass of grey we can quite understand. The composition of the picture is admirable. Mr. J. H. Gear's silver medal picture, *Sweet is Evening's Tranquil Hour*, is commendably a departure from the present fashion of representing evening as necessarily gloomy—a charming little open landscape with sheep, admirable in composition, and cheerful, though quiet. *Outward Bound*, by Mr. W. D. Welford, is noticeable for the harmony and correctness of the tones in which the sea, boat, and distant land are rendered. It is a pleasing little picture, but if we were to offer a suggestion for an improvement, it would be that a sky having a little less white in it should be substituted.

In Class C (Figure Studies and *Genre*) Mr. A. Werner's *Peasants at Work* is somewhat suggestive of J. F. Millet's work, and we are hardly surprised that the Judges have awarded it the gold medal. Their decision will probably, however, be criticised by many who are not able to understand the ideals of these gentlemen, and also by many who are able to do so. There are many admirable points about the picture, and it is certainly deserving of notice, as being something different from the ordinary run of photographic work. The silver medal is awarded to Mr. J. C. Warburg for *Blind*. This, a figure of a blind man playing a fiddle, much resembles a pencil drawing on toned paper, in which the figure is drawn with a firm hand, and the background sketched in with the lightest of touches. It is quite unlike the conventional idea of a photograph, and well worthy of the honour it has received. *Fishing for Bait*, for which Mr. W. B. Post receives the bronze medal, is a charming little harmony in greys—the figure of a man angling. This, with the mass of rock upon which he is standing, being clear and distinct, all else being grey, and serving only to accentuate the principal object. An illustration of the picture appeared in the catalogue of the Pall Mall show.

In Class D (Portraiture) Mr. R. S. Webster's *A Light at Eve* is probably as admirable as a likeness of the individual represented as it is as a portrait picture. It is sufficiently defined not to appear vague, and at the same time there is a harmonious softness, in striking contrast to the gaudy brilliancy of some of the other exhibits in the class. It took the silver medal. The Judges awarded the bronze medal to Mr. John Scott for a portrait which certainly avoids the mistakes generally made by the "photographic artist" who spends his time in turning out the conventional *carte* and cabinet portraits by the dozen; but, at the same time, although we are not surprised at the present Judges giving it a medal, we must confess that our taste is not yet educated to the point of seeing anything very great in it. It is a quiet, inoffensive little picture, which deserved a better fate than to be overloaded with the weight of the honour conferred on it.

The Beginners' Class, for those who have commenced photography since January 1, 1892, is not a very striking one, and the Judges have done wisely in withholding the second award. Miss K. G. Spink has, however, earned her silver medal for *Weary go the Feet when the Heart is Old*, a figure of an old woman toiling with heavy steps through the snow, which was exhibited at the last Pall Mall Exhibition.

The class for pictures taken by apparatus carried on a cycle is a small one, but it appears that it is not impossible to carry a camera and kit of whole-plate size in this way. The Judges have awarded two bronze instead of a silver and bronze medal, the recipients being Messrs. Howard Esler and E. Evelyn Barrow for pictures which are very similar in style. *Far from the Madding Crowd* is a pretty little picture, but the general lines of its composition are getting almost as hackneyed as the quotation which forms its title.

In Class G (for Scientific, Architectural, and other kinds of work not included in the other classes) Mr. Harold Baker receives a silver medal for one of a series of architectural studies, in which the pictorial qualities are as highly to be commended as the technical, and Miss Annie E. Blake has been awarded the bronze medal for two little studies of wild flowers in the same frame, which are simple, unpretending, and pleasing.

Class H (for amateurs who have not previously gained a medal).—Set of three prints. First prize, a hand camera. The winner of the first prize, Mr. G. V. Taylor, sends three prints, of which two are almost reproductions of one another, with the sides reversed. Mr. J. G. Patterson's three prints show the promise of still better work in the future. He receives the silver medal. The bronze-medal set, by Mr. R. H. Head, is an admirable trio of figure studies.

Among the apparatus exhibitors are the Eastman Company, whose specimens amply demonstrate that the pocket Kodak is more than a toy; Messrs. Butcher & Sons, whose hand camera and Primus gas lantern, using incandescent gas as a means of illumination, have each been awarded a medal; J. Cole, to whom a medal has been awarded for his patent rising front; G. Howe, cameras, &c.; Beresford's changing bag and focussing, and G. W. Secretan. The increasing popularity of the stereoscope is evidenced by the presence of three stalls for the sale of the instruments and slides.

Judges' Awards.

Class A (Landscape).—Gold medal, Howard Esler. Silver medal, Rev. A. H. Blake. Bronze medal, Wm. Norrie.

Class B (Hand Camera).—Gold medal, W. Thomas. Silver medal, John H. Gear. Bronze medal, Walter D. Welford.

Class C (*Genre*).—Gold medal, Alfred Werner. Silver medal, J. C. Warburg. Bronze medal, W. B. Post.

Class D (Portraiture).– Silver medal, R. S. Webster. Bronze medal, John Scott.

Class E (Beginners).—Silver medal, Miss K. G. Spink. Bronze medal (withheld).

Class F (Cycling).—Bronze medal, Howard Esler. Bronze medal, E. Evelyn Barron.

Class G (General).—Silver medal, Harold Baker. Bronze medal, Annie E. Blake.

Class A (Special).—Hand camera, G. V. Taylor. Silver medal, J. G. Patterson. Bronze medal, Robt. H. Head.

Apparatus.

Silver medal for the best cyclist's hand camera—Butcher & Sons, Blackheath, S.E., for the "Primus." Silver medal for the best photographic or lantern novelty, to James Cole, for his flexible, rising and falling camera front. Extra bronze medal, to Butcher & Sons, for the "Primus" gas lantern.

HACKNEY PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Annual Exhibition of the Hackney Photographic Society has established its right to be considered one of the events of the photographic year, as far as Londoners are concerned, and we can conscientiously congratulate the Society on including among its members so many whose works are of that standard of excellence that they would make a mark in an Exhibition of greater importance than a local society's show. The Exhibition was opened on the evening of Tuesday, the 19th inst., by the Earl of Crawford, K.T., and remained open during the two following days and evenings, a lantern exhibition being included in the evening's entertainment. The Judges were Messrs. Valentine Blanchard, A. Horsley Hinton, and Chapman Jones.

There were nine classes, of which six were restricted to the work of members; in these were included one for stereoscopic work and one for lantern slides.

Class A.—Any picture taken since the last Exhibition was a testimony to the industry of the members of the Society. It contained 112 frames, and, representing as it did one year's work only, the quality of the work must be considered a high one.

Mr. S. J. Beckett receives a gold medal, this being awarded to the best work shown in any of the members' classes. His picture, which is entitled *Waiting for the Breeze, Norwegian Fjords*, is certainly a very meritorious work, and will add to his fame. Possibly he may be able to find a printing process to suit the subject better, and certainly he might choose a mount more suitable in tone. Mr. Beckett's other pictures are all interesting, and no one can complain that he keeps repeating the same class of subject until it becomes wearisome.

Mr. J. Carpenter had five pictures, none of which will cause him to suffer in reputation. Three are subjects in which reeds and rushes formed the principal objects, and apparently all taken in the same neighbourhood, but there is sufficient difference between them to make an interesting trio. For one of these the bronze medal was awarded; but as, according to the rules of the show, no member could take more than one medal, this medal was passed on to the exhibitor of the picture next in merit, Mr. Carpenter having been also awarded the silver medal for *The Road across the Common*, an admirably selected view, extremely simple, a few bare trees and bushes and a rain-sodden path, but withal a very pleasing picture.

Mr. G. Sidney Pasco is rapidly improving in his work. The work for which he receives the bronze medal, *Chill October*, is somewhat uncommon in its style of composition, but it will find a great number of admirers. Mr. W. A. Hensler's *A Reedy Corner* has earned him a certificate, but it is not the best picture we have seen of its kind. In marshy land, such as where this picture was taken, it is difficult to avoid an immediate foreground of water; when it is so, a patch of reflected light abuts on the margin, and generally mars the beauty of the composition. This is the fault in the present picture. In Mr. Hensler's twelve exhibits there are some that would have done wisely to have kept at home.

Class B.—Pictures taken during membership.—Mr. J. J. Westcott's *Eventide* is a very small picture, a river view. There is a very pleasing air of repose about it, and, although perhaps the shadows of the middle distance are a little too dark to be strictly truthful, it is, on the whole, a charming little picture. Mr. Westcott receives the silver medal. Mr. J. Carpenter's *Heathland* is technically as good a rendering of the subject as possible; but, probably owing to the rather dim light of the gallery, the subject appears to be rather confined and wanting in relief. The picture gains for Mr. Carpenter the second place in the class, the bronze

medal being given to Mr. W. Rawlings for *Allesford*, a picture that would have pleased us greatly but for an unfortunate patch of light in about the worst place it could be placed, just on the margin of the picture. The subject is quaint, the lines fall pleasantly, and the distance is well rendered. A pretty little figure subject, by Mr. S. J. Beckett, is awarded the certificate—a little Italian maiden, gracefully posed, and with a pleasing expression. The figure might have been higher in the picture with advantage. Mr. R. Beckett's *Marshland* could not be seen at its best effect, owing to want of light, but it is a good result from an unpromising subject. We would suggest that a mount showing a greater contrast would be an improvement.

The Hand-camera Work Class contained a considerable quantity of interesting work. Mr. Fenton-Jones's *Lake Lucerne* receives the silver medal, Mr. S. J. Beckett's *Venice* is placed second, and the bronze medal and certificate are awarded respectively to Mr. F. E. Roofe, for *Sunset, Lowestoft Harbour*, and to Mr. C. A. Russell.

The Stereoscopic Class has ten entries, and the average of the work shown is very fair indeed.

In the Lantern Slides, Members' Class, Mr. S. J. Beckett's two sets were placed first and second. Mr. M. H. Hudson receives a bronze medal, and Mr. A. Barker a certificate.

In the Open Class the Judges have chosen Mr. J. A. Hodges' beautiful picture *The Day was nearly done*, for the silver medal. It is an exquisite effect of declining day, and the air of repose about it every one will appreciate. After viewing this, the Rev. A. H. Blake's picture *Low Tide*, which receives the bronze medal, appears commonplace, and as a subject it is less interesting than his other pictures.

Among the best known of the exhibitors in the class we find S. J. Beckett, J. C. S. Mummery, L. C. Bennett, J. H. Coath, S. N. Bhedwar, W. M. Warneuke, R. Terras, and W. J. Byrne.

The Champion Class could not be considered a strong one. Mr. R. Terras is awarded the gold medal for his well-known *Ghost Story*, Mr. L. C. Bennett's picture, medalled at the last Pall Mall Exhibition, *Inward Bound*, receiving the bronze medal.

There was a good display of apparatus, &c. Messrs. Airs & Co. showed specialities in optical lanterns and their appliances; Mr. E. G. Platt showed lantern and sundry apparatus; the Blair Manufacturing Company exhibited cameras and films for use with them; Mr. H. Park showed cameras and apparatus, including Mr. J. Coles's camera with patent rising front; Messrs. B. J. Edwards had a good exhibit of their well-known good things; Messrs. Hannam & Co., showed cards and mounts; Mr. E. G. Platt and Mr. W. Tyler had exhibits of lanterns and accessories; Messrs. Fuerst & Co., showed various articles for which they are agents. Messrs. Marion & Co., Messrs. R. & J. Beck, and Messrs. J. & H. Doublet had exhibits. Messrs. W. Watson & Son showed cameras and apparatus; and the local dealers in general photographic goods, Mr. E. E. Morris and W. Rawlings, gave demonstration of the fact, that the members of the Society need not go far afield to obtain their material.

We must not omit to mention that Messrs. Wellington & Ward exhibit fine specimens printed on their bromide and other papers.

JUDGES AWARDS.—*Members' Classes.*

Best Picture.—Gold medal, S. J. Beckett.

Best Animal Picture.—Silver medal, J. O. Grant.

Class A.—Silver medal, J. Carpenter. Bronze medal, J. Carpenter and G. Sidney Pasco. Certificate, W. A. Hensler.

Class B.—Silver medal, J. J. Westcott, Bronze medal, J. Carpenter and W. Rawling. Certificate, S. J. Beckett.

Class C.—No awards.

Class D.—Silver medal, W. Fenton-Jones. Bronze medal, S. J. Beckett and F. E. Roofe. Certificate, C. A. Russell.

Class E.—Silver medal, A. D. Fort. Bronze medal, A. D. Fort. Certificate, G. Guest.

Class F.—Silver medal, S. J. Beckett. Bronze medal, S. J. Beckett and M. H. Hudson. Certificate, A. Barker.

Open Classes.

Class G.—Silver medal, J. A. Hodges. Bronze medal, Rev. A. H. Blake.

Class H.—Gold medal, Robert Terras. Silver medal, L. C. Bennett.

Class I.—Silver medal, J. H. Gear. Bronze medal, W. A. Fraser.

Our Editorial Table.

THE INTERNATIONAL ANNUAL OF "ANTHONY'S BULLETIN," 1896.
Bradford: Percy Lund & Co.

MR. F. J. HARRISON, the editor of the eighth Anthony's Annual, and Messrs. Anthony, the publishers, are to be congratulated upon the beautiful get-up and the artistic and technical value of this volume. The many half-tone illustrations are of uncommon merit, although, in passing, we may point out that some of the figure studies here reproduced convince us that much has yet to be learned by our American cousins in the nice art of unconstrained grouping and posing. Among the more prominent contributors are Messrs. Valenta, Schroeder, Niewenglowski, Gaedicke, F. C. Lambert, Duchochois, Bothamley, Bogardus, Schumann, Burton. The editor says, "It may be that, before the issue of another volume, some practical method of reproducing the colours of nature . . . . will be in the hands of our readers." In the sense implied, we hardly share the optimism of our brother-editor. A lady, Miss E. Culverhouse, gives an account of a visit paid to Cadett & Neall's dry-plate factory, and thus describes the process of coating with emulsion: "The next process was coating with emulsion made from calves'-cheek gelatine, fish gelatine being not found so suitable for the purpose. There were two tons of foreign gelatine ready to be made up, English calves not being sufficiently numerous to meet the demand." The Annual is a handsome book, full of good things appealing to practical workers.

CHRISTMAS AND NEW YEAR'S CARDS.

MR. JONATHAN FALLOWFIELD, of 146, Charing Cross-road, W.C., has sent us specimens of Christmas and New Year's Cards, for photographs that he is placing on sale. They are all marked by elegance, good taste, and appropriateness. Among them may be mentioned a folding card with inside pocket for the insertion of a mounted or backed print; a folding card with embroidered edges; mounts for paste-down photographs; slip-in mounts with gold bevel edges; and the new "Stuart" mount in ivory Bristol cream with crinkled edges and square corners. Each of these bears a suitable motto, and we can recommend photographers to give attention to such excellent and refined productions. They are sure to please buyers and recipients alike.

A MAMMOTH catalogue—extending to nearly 500 pages—is that of Mr. Walter Tyler, of Waterloo-road. Scarcely a single lantern accessory is omitted to be mentioned in it, and the section of the book devoted to sets of slides for hire lays bare a bewildering selection, embracing almost every conceivable subject upon which lantern lecturers may wish to descant. It is a catalogue that every lanternist will find useful.

News and Notes.

THE North Middlesex Photographic Society's Annual Exhibition of members' work will be held at Jubilee Hall, Hornsey-rise, on December 2, 3, and 4. All communications for the Society should in future be addressed to Mr. W. Taylor, 38, Palace-road, Hornsey, who has taken over the duties of Honorary Secretary.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, December 5. Mr. Ethelbert Heary, C.E., will give a practical demonstration of the photo-keramic process. Visitors are always welcomed by the members.

BURGLARY.—The premises of Messrs. E. H. Fitch & Co., Fulwood's-rents, Holborn, were entered and overhauled by burglars on the night of Friday, November 22. Messrs. Fitch write us: "We are happy to state that our business has not been interfered with by the burglary at our factory on the night of the 22nd, and we are in a position to execute all orders with promptness."

THE DULWICH PHOTOGRAPHIC SOCIETY.—This Society was founded on October 2, 1895. At the first meeting, which took place on October 17, Mr. H. Jackson gave a demonstration entitled *The Origin and Development of Photography*, as far back as the year 1556 up to the present date, which was very interesting. At the meeting, on October 29, 1895, Mr. H. J. Ellis gave a demonstration of development with different formulæ.

THE European Blair Camera Company informs us that the issue of a circular having created an impression in the trade, and amongst their clients generally, that the right to manufacture and supply Bull's-eye cameras and film cartridges is wholly vested in another firm, the transactions mentioned in the circular do not affect the Blair Company's business in any way, as they are supplying, and will continue to supply, the Bull's-eye cameras and cartridges of improved models.

WE hear from Paris that the famous printers, Messrs. Mame, of Tours, count on the forthcoming *Life of Christ* in colour photography after the body-colour drawings of M. James Tissot, as likely—after the success of his Biblical Arab sketches at the Salon of the Champ de Mars, to which we have more than once alluded in the highest terms—to prove the most profitable venture of the modern French press. The selling price of copies Nos. 1 to 20 is to be 200*l.* a copy, and of copies Nos. 21 to 1000, 60*l.* a copy. The advertisement, containing one specimen coloured plate and some sketches reproduced in black and white, is to be sold at 60 francs a copy. There is no more curious figure than that of the author, who, after a distinguished career in Paris, and when he lived in London at about the age of thirty-four, was a sceptical, half-Communist painter of Bougival and Asnières boating vulgarities, and who, at the age of fifty, in 1886, became a religious mystic, who does all his work in Palestine.—*Athenæum.*

PROPOSED PHOTOGRAPHIC SOCIETY FOR MOSELEY.—A meeting was held on Tuesday, November 19, in the Moseley and Balsall Heath Institute, and it was proposed and carried "That a Photographic Society be formed for Moseley." Dr. Hall Edwards was voted to the chair. A provisional Committee, consisting of the following gentlemen, was then elected:—Dr. Hal

Edwards, Mr. Taylor, Captain Davidson, and Messrs. C. Williams and F. Coop. Dr. Hall Edwards proposed, and Captain Davidson seconded, the proposition "That Mr. F. Coop be Hon. Secretary *pro. tem.*" Many gentlemen then gave in their names as intending members. Future meetings will be held in the above rooms. There will be no entrance fee for gentlemen joining this year, and the subscription was fixed at *5s.* A circular will be sent round shortly, notifying the "inaugural meeting," and it is hoped that all photographers in the district will make an effort to attend.

BACTERIA ON PLATES.—Mr. C. R. Newton writes to the Editor of the *Journal of the Photographic Society of India*:—"With regard to your remarks last month on bacteria attacking plates, according to Migula's experiments, one of nitrate of silver in 12,500 is sufficient to prevent their growth, and he places this substance fourth in his list of germicides; nevertheless, some species seem occasionally to grow. Enclosed you will find two small pieces of an Edwards's film, which, if placed under a one-sixth or higher power of the microscope, will be seen to be covered on the surface with one mass of spores; these are by far the most prevalent forms seen on a fixed plate, and are probably those of a mould fungus. These latter cause far more destruction to plates than the bacilli, as their spores are so much more resistant. There is one especial sinner constantly formed on a certain brand of orthochromatic plates, but which I have not met with elsewhere. None of these attack the film of Ilford P.O.P. It, however, suffers from many diseases, but they do not seem traceable to a *contagium animatum*. It is difficult to discover colonies of bacilli on plates, as they are rarely visible in the dim light of the dark room; the mould fungi can, however, generally be seen by holding the plate at an angle with the source of light and looking along its surface, when they appear as dull spots."

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December	Name of Society.	Subject.
2	Camera Club	Smoking Concert.
2	North Middlesex	
2	Peterborough	
2	Richmond	Lantern Evening. Members' Slides.
2	South London	*Hints on the Improvement of Negatives.* H. J. Dalby.
2	Stereoscopic Club	
3	Birmingham Photo. Society	
3	Bolton Photo. Society	
3	Brixton and Clapham	Lantern Evening.
3	Exeter	
3	Gospel Oak	Cresco Fylma Demonstration. C. G. Borrett.
3	Hackney	
3	Herefordshire	
3	Keighley and District	
3	Lewes	
3	North London	
3	Paisley	
3	Putney	*The Shakespeare Country.* Mrs. Catharine Weed Ward.
3	Rochester	
3	Rotherham	
3	Sheffield Photo. Society	
3	York	
4	Camera Club	Exhibition of Science Lantern and other Novelties. Ross & Co.—Demonstration of Venus Printing-out Paper. Milne & Co. *Flashlight for Group Taking.* J. Smith.
4	Croydon Camera Club	
4	Edinburgh Photo. Society	
4	Leytonstone	
4	Photographic Club	Practical Demonstration of the Photo-ceramic Process. Ethelbert Henry, C.E.
4	Southport	
4	Southsea	
5	Birmingham Photo. Society	
5	Bradford	Enlarging Night. A. P. Rendell and J. Jackson.
5	Camera Club	*Explosives—their Use and Abuse.* Captain J. Thomson, R.A.
5	Dundee and East of Scotland	
5	Glasgow Photo. Association	
5	Glossop Dale	
5	Hull	
5	Leeds Camera Club	*On a Recent Visit to Rome.* Alderman P. Gilston, J.P.
5	Leeds Photo. Society	Annual Meeting and Lantern Evening.
5	Leigh	*Toning and Fixing.* W. R. Moore.
5	Liverpool Amateur	Demonstration on Flashlight Work. J. W. Wade.—Exhibition of Prize Slides.
5	London and Provincial	
5	Oldham	*Negative Development.* T. Widdop.
5	Tunbridge Wells	
6	Birkenhead Photo. Asso.	Lantern Lecture. Mr. Rae.
6	Cardiff	
6	Croydon Microscopical	Conversational Meeting.
6	Holborn	
6	Leamington	
6	Lewisham	*Negative Reversals, and How to Make them with Certainty.* E. Eastwood.
6	Maidstone	
6	North Kent	
7	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

NOVEMBER 26,—Technical Meeting,—the Rev. F. C. Lambert, M.A., in the chair.

Mr. VALENTINE BLANCHARD described *A Method of Carbon Printing without Transfer.* The process consisted in the immersion of ordinary carbon tissue in petroleum oil for about a minute, the paper support being thus rendered translucent, and the tissue, after the removal of the surplus oil, being placed in the printing frame with the support next to the negative, and then printed in the usual manner and developed from the front. Printing occupied about three times as long as usual, as the light had to penetrate the backing of the tissue, which was also stained a pale canary colour, in consequence of the solution of a portion of the bichromate by the petroleum. It was necessary to immerse the tissue in the oil very rapidly and without a stoppage, as any hesitation resulted in the formation of markings which could not be removed in development, and quite spoiled the picture, although the immersion did not appear to affect the gelatine in any way. This was essentially an amateur's process, for the temperature of the water used in development was quite immaterial; in fact, he had actually boiled one print, and found that the tissue did not leave its support. The use of a brush was advantageous for local development, heightening the lights, &c. Mr. Blanchard advocated the employment of paper negatives, as they could be printed from either side, and he showed several prints produced by the method he described from oiled negatives on albumenised paper which he had made some twenty years ago. For enlargements, he suggested the making of a full-sized transparency, which could be worked up as desired, and from which a dense print should be made on albumenised paper, carbon prints being made from the latter. In this case printing was effected through two thicknesses of oiled paper, the negative and the support of the tissue, and the result was a slightly diffused photograph, with a very pleasing softness, which, although unsuitable for small work, was excellent for prints of 12×10 inches and upwards. If any of the oil remained in the backing after development it could be readily removed by heat.

The ASSISTANT SECRETARY (Mr. Child Bayley) showed some prints by Mr. J. A. Sinclair, on Artigue paper—a method of carbon printing requiring no transfer, but differing in manipulation from the process described by Mr. Blanchard. It was said that this paper was very difficult to work, but Mr. Sinclair had not found that to be the case.

The CHAIRMAN thought the principal difficulty was to obtain the material. He had tried, without success, to get a supply of it.

Mr. J. SPILLER, after congratulating Mr. Blanchard on the results which he exhibited, asked whether, when the carbon tissue had been saturated with petroleum, there appeared to be any reduction of the chromate to the state of the green oxide of chromium?

Mr. BLANCHARD said he could not speak of the chemistry of the process, but there was a visible result on the wrong side of the tissue after printing.

The CHAIRMAN remarked that that would be a chromium print, and added that he had been experimenting with the same object as Mr. Blanchard, and had listened to his communication with great interest.

A vote of thanks having been passed to Mr. Blanchard,

Mr. W. ETHELBERT HENRY, C.E., proceeded to give a demonstration of *Photo-ceramics.* He said a great deal of unnecessary mystery had surrounded this branch of photography, and, although the subject had been treated of in certain French and German handbooks, the formulæ given had been so erroneous that it was impossible for any one to attempt to work with them. One, for instance, gave as an organifier a mixture of honey, sugar, gum arabic, and glucose, no mention being made of water; and as a sensitiser, bichromate of ammonia, 5 ounces, dissolved in half an ounce of water. The method which he proposed to demonstrate was that known as the dusting-on process, which he believed to be the only practical commercial means of working. A roughly polished and cleaned piece of glass was coated with the following organifier:—

Le Page's fish glue	1 part.
Glucose	4 parts.
Water	10 ,,

The plate, after drying by gentle heat, should be sensitised with

Ammonium bichromate	1 part.
Water	10 parts.

A convenient method, however, was to take equal parts of each solution, and, after filtration, to coat the plate with the mixture. The coating could be done in a subdued white light, and, when dry, the plate could be exposed under a positive transparency, when those parts of the plate which were acted upon by light would be rendered incapable of attracting moisture, and consequently of holding the powdered pigment to be afterwards applied. The transparency to be printed from should be rather more dense than an ordinary lantern slide, and both transparency and plate should be warmed before being placed in the printing frame. Time of exposure could be determined by means of an actinometer, and a ghost of an image was visible before development. After printing, the plate soon absorbed moisture sufficient to enable it to hold the colour, and pigment in the form of fine powder was then dusted on it by means of a piece of cotton-wool, very slight pressure being applied, when those parts of the film which had been protected from the action of light would retain the powder, thus producing an image in the colour of the pigment selected. An over-exposed plate would refuse to take the colour, but if kept in a damp atmosphere for about half an hour it could generally be made to yield a pleasing image. When sufficient powder had adhered, the plate was coated with collodion, and washed first in a dilute solution of sulphuric acid, and then washed to remove the bichromate, and after drying, the film was ready for transferring to the plaque. The film was easily removed with a stick from the glass to a dish of water, washed, immersed in a solution of fused borax for a few minutes, and then placed with the collodionised surface next to the plaque After heating, the plaque was placed in the muffle, and in a short time the enamel was completed. A Fletcher's muffle furnace was used for firing, and there was a right way and a wrong of lighting it; the light should be applied before turning on the gas, as an explosion would probably result if this order were reversed. The enamels could easily be made to fit lockets, &c., by means of a corundum file, first

wetting the plaque in water, and filing upwards, or a grindstone might be used. It was unnecessary to bring the furnace to a white heat, and the process of firing could be watched from time to time through a sheet of mica, which protected the eyes of the operator. A number of specimens in various stages were passed round for examination, and every detail of the process was demonstrated in the course of Mr. Henry's remarks.

The CHAIRMAN asked whether it was possible to use two or more colours for one picture; for instance, to use flesh colour for the face of a portrait and another colour for the draperies, &c., and also whether different temperatures were necessary for firing different pigments?

Mr. HENRY, in reply, said two or more colours could be used on one picture, but it was necessary to select pigments between which no chemical action took place. Browns and blacks could be used together, being prepared from the same base. The specially prepared ceramic colours fused at practically the same temperature, and were perfectly true and glazed at a red heat. It was not necessary to varnish after firing, as the image was practically part of the enamel and imperishable.

The CHAIRMAN referred to the great beauty of photo-ceramics and their absolute permanence, which rendered them well worth the trouble of production, and suggested that a series of portraits of national celebrities by the process would be very valuable as a national record for future generations. For decorative panels, &c., for furniture, he thought this method of photographic printing would be of considerable utility.

The proceedings terminated with votes of thanks to Mr. W. Ethelbert Henry for his demonstration, and to the Chairman for presiding.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER 21,—Mr. T. E. Freshwater in the chair.

Mr. Arthur Hands was duly elected a member of the Association.

A number of pamphlets relating to Mr. A. L. Henderson's dispute with the Photographic Convention were distributed, and some remarks made upon the subject.

Mr. TEAPE said it had crossed his mind that the members might perpetuate the memory of their lost President by having a portrait of him hung in the room. He should like to see it done himself, and he thought most members would agree and approve of it. He had much pleasure in proposing it.

Mr. A. HADDON had great pleasure in seconding the same, and said that Mr. Traill Taylor had been a staunch supporter of the London and Provincial, and that, of all the editors of the photographic papers, he had supported it more than any of them. He thought the least they could do was to get the loan of a negative and have a print in some permanent process.

The HON. SECRETARY said that it would be a matter of real pleasure to him to see a portrait of their old friend on the walls.

The motion was carried unanimously, and the matter left in the hands of the Secretary to carry out.

Mr. BAYSTON had recently tried one of the Cooke lenses in comparison with a Goerz on the same subject and under like conditions, and passed round the negatives for inspection.

The HON. SECRETARY, referring to a discussion at the preceding meeting, said he had brought down the picture by Alma Tadema referred to, and had marked the point of sight. His impression was that the angle included was under 45°, which was a very small angle. He stated that the point of sight had reference to parallel perspective. He had taken *Academy Pictures*, published by Cassell & Co., from 1892, and made a rough sketch of the shape of the pictures, and marked with a dot the position of the point of sight, and, out of a matter of about forty pictures, there were only about four in which the point of sight was within very close proximity to the centre. The majority of them were midway between the right or left of the centre, and either towards the top or bottom. He also instanced some cases where the point of sight was outside the picture altogether, and another where it was on the extreme margin. This he passed round.

Mr. DRAGE thought the examples had greatly helped them.

The CHAIRMAN read a question from the box: "To what tint of red are the isochromatic plates sensitive, and what bath must be used to make them sensitive to deep red?"

Mr. W. E. DEBENHAM answered that cyanine would do it.

The HON. SECRETARY mentioned that the *Photographische Correspondenz* contained an article by Hubl on the subject of colour sensitisers. He asked whether orthochromatic plates were the best for certain colour subjects containing blue, red, and yellow. Would you get the best result by using orthochromatic plates or by using ordinary plates? He thought a better monochromatic rendering would be given by an ordinary plate, and that that of the orthochromatic would be flat. What he aimed at would be to get a contrast in the monochrome suggestive of the contrast to the eye offered by those colours.

Mr. DEBENHAM pointed out that one would get the reversed contrast. The luminous yellow, would be darker and the blue much lighter.

The HON. SECRETARY said that the red and blue would be much alike on the orthochromatic plate, and the yellow lighter. With ordinary plates one would get the blue light, yellow medium tint, and red black or approaching it, and he considered that would give a better idea.

Mr. TEAPE remarked that the Hon. Secretary was aiming at effect, not truth.

The HON. SECRETARY distributed some further examples of the work produced on the photo-autocopyist on rough paper.

Mr. DEBENHAM considered that for rough paper the photo-autocopyist was superior to collotype, the printing surface being soft and yielding, while that of the collotype was hard and unyielding.

The HON. SECRETARY spoke of the new Zeiss lens, Steinheil's new orthostigmat—apparently similar in construction to the Goerz, having a six-lens system, and also of one by Wray, which he promised to bring down.

PHOTOGRAPHIC CLUB.

NOVEMBER 20.—Mr, Andrew Pringle, F.R.M.S., in the chair.

Mr. Hutton P. Smith was unanimously elected a member of the Club, and two new members were proposed for election.

Mr. PRINGLE explained that the limelight jet contest, with which he proposed to edify the members that evening, originated in a correspondence in the *Magic Lantern Journal*. The importance of the subject would be admitted. To know what was the relative value of one jet to another was all-important to a lanternist or photo-micrographer, or to any person using the jet for business purposes. Mr. C. E. Hearson, always ready to assist in elucidating a physical problem, had come to their assistance and provided an adaptation of the Bunsen photometer, so that the light value could be accurately compared without the disturbing element of the personal equation, and in a scientific manner. After all, the audience would be the real judges of the relative values of the apparatus, because, although the photo-meter tests would indicate the actual values at the moment of testing, the members would easily judge how far the lights could be maintained at full intensity for any length of time, and what amount of dexterity and personal skill would be required to maintain the light. They had a long evening's work before them, and he should set the ball rolling himself by offering to light up his jet and asking some one else who had brought a jet to do the same, and Mr. Hearson would give the light values as indicated by the photometer.

Mr. SCARBOROUGH asked if there would be a limitation to the amount of "roar" permitted, and the reply was that the audience would probably raise an objection if such a thing occurred.

Mr. FRESHWATER (Messrs. Newton & Co.) asked if fresh limes might be used, and the reply was, Certainly.

At this point Mr. Pringle left the chair and commenced to light up a mixed jet, and the meeting became of the practical order.

Mr. Newman (Messrs. Newman & Guardia) was appointed to assist Mr. Hearson in taking the readings of the photometer; Messrs. J. E. Hodd and S. H. Fry to read the amount of gas used by each competing jet; Mr. F. A. Bridge and Professor Haddon were appointed to manipulate any jet the owner of which might be nervous or not present.

After a long series of competitive testings, in which jets of all patterns and shapes, and saturators, were included, the victorious jet was declared to be one made by Otway and manipulated by Mr. Scarborough. In round figures this jet consumed about eighteen feet of the mixed gas per hour, and this consumption gave better results than other jets, some of which, but not all, used as large a quantity. Mr. Scarborough, who is an amateur lanternist, and Hon. Lanternist to the London Institution, has had a similar success with his jet at the competition held by the Lantern Society in Hanover-square. On the occasion referred to, he was successful in beating the electric arc lamp as applied to the Lantern Society's apparatus, so that he may be said to be a very experienced operator. As compared with an ether saturator, the jet was immensely superior in light-giving power, but the light given from each was in about equal ratio to the gas consumed. A saturator burning four feet of oxygen per hour was stated to be of one-fourth the power of the best mixed jet. Full figures will be given in the Club minutes after Mr. Hearson has verified them.

At the conclusion of the testings Mr. HEARSON explained the use and working of the photometer to the meeting, and stated that he had devised an alternative method of comparing the lights in the lantern by means of specially prepared lantern-slide diagrams. These he promised to show to the Club on Wednesday evening, January 22.

Ealing Photographic Society.—At a meeting of this Society, held at the Public Buildings on Thursday, November 21, there was a good attendance of members. Mr. W. T. White (Vice-President) occupied the chair. Mr. E. H. Richards and Mr. Payne Curtis were elected members. Mr. F. W. COX read a paper on the *Life of Turner*. He admitted that that the subject was not a photographic one, but expressed the opinion that a consideration of Turner's works could not fail to be beneficial to photographers. Turner was born on April 23, 1775, in Maiden-lane, Covent Garden, where his father kept a barber's shop. After his father had taught him to read, he went to shool at Brentford and Margate, where he had drawing lessons. He was a dull boy, and made little progress in learning. On leaving school he occupied himself in making copies of engravings, which were sold in his father's shop for a few shillings each. At the age of fourteen he entered the schools of the Royal Academy, was elected an associate at the age of twenty-five, and a full Academician three years later. He resided for many years at Twickenham, and also had a house in Queen Anne-street. He died on December 19, 1851, in a cottage at Cheyne-walk, whither he had secretly retired some time previously. He amassed a vast fortune, much of which was dissipated in litigation arising out of his home-made will. Mr. Cox graphically depicted the life of the period of Turner's birth and early years, with special reference to the condition of art, and gave an interesting description of the "topography draughtsman" of the day and his work. He showed how Turner gradually broke away from the traditional methods, and developed his strikingly original talent. He next passed in review the painter's principal works, formulated a carefully compiled appreciation of his character, and gave many amusing anecdotes illustrative of his extraordinary industry, his frugality, his avarice, his secretiveness, his bluntness, his ludicrous incapacity to express himself, and his rivalry of Claude. Turner was, he said, greatly interested in the Daguerreotype process of photography, and sat many times for his portrait at Mr. Mayall's studio in Regent-street. These photographs had unfortunately been destroyed. Mr. Cox showed a number of fine engravings from the various works illustrated by Turner, and, at the conclusion of his paper, he was accorded an enthusiastic vote of thanks.

Gospel Oak Photographic Society.—On Tuesday, November 19, a lecture was given in the Lecture Hall of the Gospel Oak Congregational Church by Mr. E. Galway, his subject being *A Trip on the River Ouse with Camera*. The slides, which were thrown on the screen by means of a very powerful

limelight lantern, were from negatives taken by the lecturer during a holiday on the Ouse, and the various phases of country and river life were beautifully depicted, which the audience were not slow to appreciate by the applause which the lecturer met with at several intervals during the evening. Musical accompaniments were rendered by Mrs. Glover on the auto-harp, and Mr. J. Gittens on the 'cello. The singing of Miss Randall and Mr. T. Adams were very much appreciated.

North Middlesex Photographic Society.—November 18, Mr. Beadle in the chair.—Mr. MUMMERY (the President) read a paper on the *Carbon Process*. After sketching the early history of the process, he, by means of diagrams on the blackboard, showed how the image was formed during printing and developing. He next touched upon the sensitising of the tissue, and illustrated, by means of prints from the same negatives, the different results obtained by using a strong and a weak bath of bichromate of potash, the prints prepared in the latter being much more brilliant. By this means you can suit the process to any class of negative. He pointed out the advantage of drying the tissue after sensitising, face down, on to a ferrotype plate or sheet of celluloid, which not only gave a better surface, but protected it from dust and fumes. After sensitising a piece of tissue in a five per cent. solution of bichromate of potash, with the addition of a few drops of ammonia, he developed several prints, one of which had been exposed to twenty-one inches of magnesium ribbon, and which proved fully exposed. Among other things he mentioned that an actinometer was a necessity, as the printing could not be watched. A vote of thanks was passed, and the meeting then terminated.

Richmond Camera Club—On the 18th inst. Mr. Williams presided.—Mr. HECTOR MACLEAN (President of the Croydon Camera Club) read a very interesting paper, entitled *Photographic Impressions and Finger Posts*, in which he touched upon various matters of interest to photographers generally, and more particularly to such as were exhibitors and members of photographic societies. The lecture included remarks on the two principal Exhibitions, the "Royal" and the "Ring," and on the use and abuse of Exhibitions in general, a strong condemnation of the practice of "working up" negatives and prints with pencil and brush, and sending the hybrid results to Exhibitions to compete with photographs, and a eulogy of the useful work which was accomplished by photographic societies. In the discussion which followed, Mr. DAVIS thanked Mr. Maclean for his vindication of societies and their work in view of a certain impertinent and offensive article on the subject which had recently appeared in the photographic press.

South London Photographic Society.—November 18, Mr. S. W. Gardner in the chair.—The evening was devoted to a competition of lantern slides from negatives taken at the Society's excursion in 1895. Mr. F. W. Levett, Hon. Secretary of the Brixton and Clapham Camera Club, and Mr. E. R. Bull acted as Judges. Mr. E. A. Allen, Hon. Assistant Secretary, was declared the winner. The best individual slides were shown by Messrs. Boyce and French, one producing the best technical slide, and the other the most artistic treatment of the same subject. Slides by various members were afterwards shown.

West Kent Amateur Photographic Society.—Annual General Meeting, Monday, the 11th inst., the President (Mr. Andrew Pringle), in the chair.—After the transaction of ordinary business, Mr. PRINGLE gave his presidential address on *Processes*. Having worked at times all the well-known processes, he claimed that he was able to speak of them with a certain degree of confidence. In "negative processes" the first point to settle was, Should a fast or a slow plate be used? For hand-camera work, some of which, Mr. Pringle remarked, was now extremely good, his experience taught him that a plate marked 100 (Hurter & Driffield) was quite fast enough. He found that by resting the camera upon an ordinary walking stick slightly modified, which he termed his "unipod," he obtained dead-sharp negatives with half a second exposure. For ordinary stand work the plate should be a slow one, because of the general tendency to over-expose, and because most people found it far easier to accurately count three or four seconds than one second. But a shutter accurately marked to time might very well be used. Referring to the large number of developers in use to-day, Mr. Pringle specially mentioned metol as a favourite with him. It was more tractable than amidol, and gave density more certainly. Amidol was good when the exposure had been a minimum one. Pyro, preserved with sulphite of soda or metabisulphite of potash, and used with ammonia, was hard to excel for general work, and the slight fog which it caused was, in nine cases out of ten, advantageous. Ferrous oxalate was at its best when used as a developer for scientific purposes. The following formula gave the most powerful developer known to the lecturer:—Two per cent. of metol and two per cent. of hydroquinone in a one per cent. solution of metabisulphite of potash, with equal measure of a two per cent. solution of caustic soda. Albumen printing was little used now by amateurs. Gelatino-chloride was good with delicate negatives. Platinum was somewhat unchangeable in tone. Carbon gave great choice of colour and surface. The one objection to carbon was the unfortunate soapiness of the surface of the prints. This led Mr. Pringle to refer to the new French printing process of Artigue, in which there was an absolute absence of gloss, the shadows being of the most perfect homogeneous dead black. It was apparently a variation of the carbon process. The image was brought up by the use of warm water (not over 27° C.), mixed with very fine sawdust. Enlargements were mostly done on bromide paper, and these, when toned, are excellent. A gelatino-chloride paper called Presto, when developed with eikonogen and toned with gold and sulphocyanide, gave admirable results. For lantern slides Mr. Pringle strongly recommended the dry-collodion process. Many beautiful prints, illustrative of the several processes, were shown.

Aintree and District Society of Photographers and Lanternists.—This Society's second annual Exhibition of combined work in photography, oil and water-colour paintings, and other fine-art specimens was held in the Walton Institute on Friday and Saturday, November 22 and 23. On the opening evening the result of the adjudication in the photographic competitions was announced by G. Farmer, Esq., C.C., as follows:—Society Members' Work—For six prints: first (silver medal), Mr. D. J. Neill (Hon. Treasurer); second, Mr. W. Lockier; third, Mr. John Watson. For six slides: first (silver medal), Mr. John Harris; second, Mr. W. Lockier; third, Mr. E. P. Herron. Open Competition—For six prints: first (silver medal), Mr. C. F. Inston; second, Mr. J. Earp. For six slides: first (silver medal), Mr. George E. Thompson; second, Mr. E. P. Herron. The awards were made by Messrs. J. W. Wade and Davenport, of Manchester. A very interesting lecture was given on Friday evening by Mr. George E. Thompson, entitled *Shakespeare's Home and Character*, and on Saturday evening, by Mr. George A. Ashley, entitled *A Glance Round; or, A Trip up the Mediterranean*. The Exhibition was a very successful one, as manifested by the crowded attendance on both occasions.

Leeds Camera Club.—Mr. Alex. Keighley, the President of the Bradford Photographic Society, favoured the members of the above Club with a most instructive address on *The Principles of Art as Applied to Photography*, at the Camera Club's fortnightly meeting on Thursday, November 22. Mr. Keighley is recognised as a master of the artistic side of photography, having gained medals at almost every recent photographic exhibition in the kingdom and he has shown himself not only capable of producing such work, but also of showing others how it may be done—which does not always follow as a natural sequence. Confining his subject almost exclusively to landscape photography, the lecturer explained the principles of composition, showing what parts of the picture the more important objects should occupy, the necessity of "support," or "balancing-spot," for the lines forming the view, and the advisability of working out these lines upon some definite plan, whether the diagonal, pyramidal, radial, circular, or diamond form of composition be most suitable; pointing out how the introduction of parallel lines detract from the beauty of the picture. Chiaroscuro and the values of light and shade and proper contrast were fully dealt with, the lecturer throughout illustrating his remarks with carefully executed limelight views, many of which were reproduced from his own negatives. Several of Mr. Keighley's works are now on exhibition at the "Black and White" Exhibition in the Art Gallery, and are all excellent examples of art and photography. On December 5, the ex-Mayor (Mr. Gilston) will deliver a lecture *On a Recent Visit to Rome*, which will be illustrated with limelight views from his own negatives. Members will be provided with tickets for friends, the large room at the Club's headquarters (Brayshay's Restaurant, Bond-street) having been engaged for this evening.

Liverpool Amateur Photographic Association.—On Thursday evening, the 21st inst., a most interesting and instructive demonstration was given in the Society's rooms by Mr. E. BANKS upon the new acetylene gas, principally with regard to its use for photographic purposes. Mr. Banks treated of the constitutents and manufacture of the gas and its various properties in a very lucid manner, and pointed out that it could not strictly be called a new gas, as it had been known to chemists for many years, but it was only recently that its manufacture, upon anything like a commercial scale, had been made possible. The gas was afterwards manufactured by the lecturer in some apparatus kindly lent by Messrs. Sharp & Hitchmough. The brilliancy of the light produced in a No. 0 union jet Bray burner (the smallest obtained at the time) was astonishing to those who had not seen it before. The light is only in its experimental stage at present, but photographers and others requiring an intense light would do well to keep it in view. It is hoped that, when a more suitable burner can be obtained, the gas, which can be made as it is used, may, amongst other things, be adapted for use in the optical lantern for small exhibitions in private houses, schools, and in place of, and as an improvement upon, the three or four-wick oil lamps now so frequently employed. Owing to arrangements for the demonstration having been completed on Thursday afternoon, it was not possible to notify the members; consequently there was not as large an audience as could have been desired.

Llandudno Camera Club and Lantern Society.—November 21, Lantern Night, Mr. Elias Jones, J.P., in the chair.—There was a good attendance, and a number of slides by Messrs. J. Dean, W. G. Jones, A. H. Hughes, and E. Deacon were passed through the lantern; also about thirty slides of Venice were exhibited and described by Mr. A. H. Hughes, to whom a hearty vote of thanks was accorded, bringing to a close a most enjoyable evening. Subject for Thursday, December 5, *Lantern-slide Making*.

Glasgow and West of Scotland Amateur Photographic Association.—November 18.—Mr. NAHUM LUBOSHEZ, from the Eastman Company, demonstrated the development of the Company's platino-bromide paper; also the process of toning the resulting prints with hypo and alum. In the course of the demonstration he gave many valuable hints on the use of the paper for printing and enlarging. Mr. Luboshez afterwards lectured upon portraiture, showing the fallacies of lighting as usually practised, and pointing out methods by which likeness can be better obtained. An exhibition of lantern slides followed.

FORTHCOMING EXHIBITIONS.

1895.		
November 29, 30	...	*Stanley. Walter D. Welford, 59 and 60, Chancery-lane, W.C.
,, 29, 30	...	*Leytonstone. B. Harwood, 110, Windsor-road, Forest Gate.
December 2–4	.....	North Middlesex Photographic Society.
,, 18–20	.....	Blairgowrie and District Photographic Association J.C. Gorrie, Hon. Secretary.
,, 20, 21	.....	*Nottingham Camera Club. W. Edgar, 123, Clinton-terrace, The Park, Nottingham.
1896.		
March	.....	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 21,979.—"Improvements in Stands for Displaying Photographs and other Pictures or Objects." J. G. HALL.—*Dated November*, 1895,

No. 21,989.—"Means for Producing Photographs resembling Engravings." Complete specification. H. E. MENDELSSOHN.—*Dated November*, 1895.

No. 22,136.—"Improvements in Photographic Cameras." J. H. THORNTON and E. PICKARD.—*Dated November*, 1895.

No. 22,138.—"Improvements relating to the Preparation of Coloured Plates for Photographic Colour Printing." A. BAUMGARTNER.—*Dated November*, 1895.

No. 22,186.—"Certain Improvements in Portable Apparatus for Making Photographic Lantern Slides." E. UNDERWOOD.—*Dated Noveember*, 1895.

No. 22,187.—"Certain Improvements in Combined Time Exposure and Instantaneous Shutters for Photographic Cameras." E. UNDERWOOD.—*Dated November*, 1895.

No. 22,282.—"Improvements in Optical Lantern Slides." W. BUTCHER, W. F. BUTCHER, and W. J. SPURRIER.—*Dated November*, 1895.

No. 22,301.—"An Improved Photographic Shutter." W. THOMSON and H. SMITH.—*Dated November*, 1895.

No. 22,414.—"An Automatic Indicator for Photographic Magazine Cameras and Changing Boxes." S. J. LEVI and A. J. JONES.—*Dated November*, 1895.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PROPOSED MEMORIAL TO THE LATE J. TRAILL TAYLOR.

To the EDITORS.

GENTLEMEN,—I note in THE BRITISH JOURNAL OF PHOTOGRAPHY that you have received numerous letters "expressing regret at the death of Mr. J. Traill Taylor." I think it would be very fitting to erect some memorial to his memory. My absence from England will prevent me from taking an active part in the realisation. I would suggest that a bust should be modelled in marble or terra cotta, and placed in the rooms of the Royal Photographic Society; and should any kindred society desire copies they could have them at reduced prices. It might be better that the memorial should be of a national character. I will be pleased to add my mite towards the expense.—I am, yours, &c.,

A. L. HENDERSON (the late Mr. Taylor's oldest London friend).

Hotel Belmont, Montreux, Suisse, November 23, 1895.

[Several suggestions of the nature of that put forward by Mr. Henderson have already reached us, and we are in a position to state that a meeting will shortly be held in London to decide upon the form the proposed memorial to the late Mr. Taylor shall take.—EDS.]

ORTHOCHROMATIC PHOTOGRAPHY WITH ORDINARY PLATES.

To the EDITORS.

GENTLEMEN,—Mr. Punnett, of the Seed Dry Plate Company (page 735), states that he has not obtained satisfactory results with a naphthol yellow and chrysoidine screen. If not, it is because his naphthol yellow was not sufficiently deep for the purpose.

Naphthol yellow alone, if sufficiently deep, is far more effective than aurine with ordinary plates, because it more completely cuts out the dark violet and ultra-violet rays. All ordinary plates are hundreds of times more sensitive to the blue and violet spectrum rays than to the orange and red, and with such plates an orange screen that does not completely cut out the dark violet and ultra-violet rays is likely to be worse than useless. I thought that I sufficiently emphasised the importance of using a *deep* naphthol yellow screen by showing, in my illustration, that a lighter one did not cut out all of the violet and ultra-violet rays.

Mr. Punnett is also mistaken in his assumption that the Seed plates are unique among ordinary plates for colour-sensitiveness. The Stanley plates of some years ago gave almost exactly the same results, and some other makes are nearly as good. In my experience the only extremely rapid plates that were notably inferior in this respect contained a very large proportion of iodide of silver, which, as is well known, is itself always practically insensitive to the less refrangible rays.

The picture of a bouquet of flowers referred to by Mr. Punnett did not, in my opinion, prove anything.—I am, yours, &c., F. E. IVES.

London, November 19, 1895.

PROCESS WORK: A HINT.

To the EDITORS.

GENTLEMEN,—It is probable that the defective mechanical condition of the copper plates used in process work, either half-tone or photogravure, is one of the general stumbling-blocks to success. Now, what is to prevent a surface of pure copper being deposited upon the plate? a simple matter in itself, and any degree of hardness of deposit can be obtained by regulating the current and other well-known conditions of electro-deposition.

This deposited surface would enable an inferior grade of metal to be used as a base, so that the ultimate cost of the plate would be about the same as now.

This regular deposit would at once do away with any unequal density on the surface, due to rolling or planishing, and form a certain basis for the photo-chemical processes.—I am, yours, &c., FRANK MIALL.

13, *Sandgate-road, Clapham Junction.*

RE "A BUSINESS TOPIC," *PEARSON'S WEEKLY*, &c.

To the EDITORS.

GENTLEMEN,—The apathy shown by photographers generally on these and kindred matters is appalling. It is my privilege to know a number of photographers, and a more kindly, courteous, and deserving set of men one could not wish to number among their friends. Can nothing be done to arouse them to look after their own interests? Individual effort is of little good, united effort might do much.

Among existing societies the National Association of Professional Photographers seems to be the only one fitted to deal with the purely business aspect of photography. Its leaders—men such as Messrs. Fall, Barry, and Draycott—could and would do much if sufficiently backed by their professional brethren.

A great deal could be said, but my desire is to call the attention of older and abler men than myself to subjects of such import, and I would suggest that THE BRITISH JOURNAL OF PHOTOGRAPHY should open its correspondence column, so that these things should be thoroughly discussed.—I am, yours, &c., R. W. HOWES.

East Dereham.

To the EDITORS.

GENTLEMEN,—*Re* "A Business Topic," which was published in the JOURNAL of November 22. I take it for granted that Mr. Randall's firm of cheap photographers is doing a large coupon trade, with branches in all parts of London; if so, the scale of charges is correct, so also are the takings estimated by Mr. Randall.

I was in the employ of this firm for a few months as a retoucher, and I also was surprised as to the amount of trade done (but still more surprised at the treatment the assistants received). The takings at "my branch" on certain days during the week was from 10*l.* to 14*l.*, with an average of 61*l.* per week. It will, no doubt, be new to Mr. Randall and others that this firm is now turning out, in large quantities, platinotypes at 12*s.* per dozen. The work, I must admit, is fair. The demand for this cheap class of work, I have no doubt, would soon go down if the public who patronise this firm once "got ear" of the manner in which the assistants are treated.

Fancy, gentlemen, a firm making over 16,000*l.* per year paying a retoucher from 20*s.* to 25*s.* per week, for which he has to retouch over thirty negatives per day, from 9 a.m. to 8 p.m., having the audacity to stop 4*s.* 2*d.* for being absent a day through illness; such is the generosity of this firm. Had I stopped twenty years, I should not be entitled to a day's holiday, but all hands must slave on all Bank Holidays. Dustmen employed by the vestries receive better treatment than this. I must pass over the bullying, the assistants are getting used to it now, so I am told; but I have heard the operators grumbled at for doing no business on wet and dull days. But here, gentlemen, is the keynote of this firm, in the following notice, printed in bold type, and exhibited in a prominent position in all the dressing and reception rooms: "Notice, in case of any incivility by assistants, or dissatisfaction with photographs, all customers are requested to send all complaints by letter."

The above notice is an insult to all the assistants in the firm, and leads "customers" (good word, "customers") to expect incivility. It would be interesting to know if such a notice is exhibited by any other firm.

In conclusion, gentlemen, one cannot expect any other treatment from a firm, as Mr. Randall puts it, who "cuts wages down to a starvation level" to swell their own profits.—I am, yours, &c., A RETOUCHER.

London, W., November 23, 1895.

REPORTING AT PHOTOGRAPHIC SOCIETIES'.

To the EDITORS.

GENTLEMEN,—If reports of meetings of photographic societies are to be of any value, they ought to give a reasonably full account of the transactions, and, when instruments are exhibited or mentioned at all, they ought to have fair play. The hand camera shown by Mr. Brothers at the meeting of the Manchester Photographic Society of last Thursday week was lent by us at his request, and, in addition, we supplied one which had the side removed to show the mechanism.

The instrument is mentioned in the report of that meeting in a most

offhand manner, and the report will have a misleading effect, as it is stated to have, as specialities, "simple changing and magazine."

As the specialities named comprise only two out of several absolute novelties included in the camera, you can understand our chagrin, especially as we know that Mr. Brothers is well qualified to describe the instrument, he having used one of them with success.

We do not want a free advertisement, but we ask you to allow us to enter our protest against the treatment dealt out to us in this instance.

We enclose one of our new descriptive books for your kind perusal, and in justification of the position we have taken in the matter of this meagre, miserable attempt at reporting.—We are, yours, &c.,

THOMPSON & Co.

4, *Bull's Head-yard, Manchester, November* 25, 1895.

[We insert Messrs. Thompson's letter, not because we believe that any intentional injustice was done to their camera by our Manchester friends, but in the hope that it will convey to photographic-society secretaries generally a hint to make their reports as full and clear as possible.—EDS.]

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & Co., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon.*

PHOTOGRAPHS REGISTERED:—

James Robinson, 65, Grafton-street, Dublin.—*Photograph of Madame Ella Russell, as Elsa in "Lohengrin."*

Robert Charles Whitehouse, 59, Piccadilly, Manchester.—*Group of National Association of Master Plumbers of Great Britain.*

James McGowan, 4, Heaton-street, Wigan.—*Photograph of bottom of shaft, Alexandra Pit, belonging to the Wigan Coal and Iron Company, Wigan.*

LT. FRANK RENNICK.—You will find the Goerz lens fulfil your requirements.

SANNAH.—Your query is unintelligible. What sort of stripping plates do you mean—what process?

B. L. E.—Marion & Co., Fallowfield, Adams & Co., and similar houses, doubtless, supply what you require.

J. CHESTER JERVIS (Nice).—The Venus paper is obtainable of Milne & Co., 1A, Ramsden-road, Balham, S.W.

WALTER BENINGTON.—1. Probably the colour used is the cause of the trouble, as it is most likely a compound of mercury. Use some other pigment in future. 2. Two names for one and the same meaning.

R. C.—Your friend is quite right. The collodio-chloride is not at all a new process; indeed, it is one of the oldest printing methods. It was introduced some thirty years ago, and, what is more, it has been in constant use, though on a limited scale, ever since.

W. ADAMS.—There need be no trouble in the matter in your case, as we believe Carter, Paterson, & Co. make no difficulty in the carriage of charged cylinders. They, we know, deliver in your suburb. Write to the compressors; they will give you every information.

ALBERT G. WHITE (Italy) writes: "Captain Abney, in his *Instruction in Photography*, describes a gelatino-silver bromide *separator*. I should like to get one like it. Please let me kindly know to whom am I to apply."—Write to Watson, Laidlaw & Co., Glasgow. They are the makers.

STAFFS.—We can do nothing in the matter, of course. If the photographer persists in selling and exhibiting the portrait, though forbidden by the sitter, place the matter in a solicitor's hands, or take proceedings yourself in the County Court. The law will give redress, as the photographer will find to his cost.

S. A. G.—If either metol or hydroquinone be used as a developer, instead of ferrous oxalate, no acid clearing solution is necessary. Therefore the danger you imagine of acid in the prints when they are put into the fixing bath will be avoided. Some papers, however, work better with the iron than with other developers.

SODA.—We do not know the brand of plates that the correspondent wrote about. But any brand might produce similar results if not properly used. All the lantern plates that we have tried yield results that leave nothing to be desired. If you cannot get good results on the commercial plates, it is certainly not their fault.

A SCOTTISH READER.—The material alluded to has not been put on the market, and, if it had been, it would not answer your purpose. It is very annoying, after going to the expense to find the supply of gas stopped. We know of no apparatus for making gas economically on so small a scale as for six burners. We should advise you to adopt one or other of the improved lamps for burning mineral oils.

T. HOYLES.—1. The carbon paper in question is not, so far as we are aware, procurable in this country, hence you must get it direct from the maker. 2. Boxwood dust may be obtained from any of the dealers in jewellers' materials in the neighbourhood of Clerkenwell. 3. Finely ground lamp and other blacks are supplied by artists' colourmen. The ordinary colours of the oil shops are useless for the purpose.

T. J. W.—Gum arabic is far preferable to dextrine as a mountant for photographs, as the latter, as met with in commerce, is almost invariably acid, and would act injuriously on the prints. Good gum arabic, when used freshly made, is by no means a bad mounting material, though it is said to have a bad reputation. Some of the oldest photographs we have were mounted with gum, and they have not suffered from the mountant.

S. E. REED.—For the size screen you require to illuminate, a blow-through jet will do quite well, and that we should advise you to use, and for two reasons. First, the light will be ample; and, secondly, because, as it is your first essay with the limelight, you cannot meet with an accident. When you have gained some experience, if you wish to show on a much larger screen, then we should recommend you to use the mixed jet, and not till then.

A WELLS.—A series of lantern slides of rural scenes would be very interesting if they were of artistic merit. But we rather question whether they would prove a commercial success unless they possessed some interest beyond being "rustic bits." They ought, in addition to being excellent, to be of interesting and well-known spots or places, to prove remunerative. The only thing we can suggest is to submit the pictures to some of the publishers of lantern slides.

LONDON W. C.—The condenser should not be less than four inches; but, if you require the lantern for enlarging purposes as well, that size will not be large enough for quarter-plate negatives. To enlarge from that size if the whole of the subject has to be included, the condenser should not be less than five and a quarter inches. This size will entail a loss of light if used for the ordinary lantern slide. We should advise you to have the lantern made so that it will take both size condensers, using the one or the other as required.

NIMROD.—In all probability you will fail, unless you use a lens that can be used with a much larger aperture than *f*-22, to obtain a good photograph of huntsmen and hounds in full cry at this time of the year. In some respects the difficulty will be less, as you will be moving with the "field;" but it will be increased by the fact that the camera must move with the horse. The only chances of success are: a lens that will work with a large aperture, quick plates, a very rapid exposure, and, most important of all, a good light—the greatest difficulty of all during the hunting season.

H. BLACK writes: "I should esteem it a great favour if you would enlighten me on the following questions, viz.:—1. In making bromide enlargements, is the vignette card adjusted between lens and paper, or how, to secure best results? 2. Is any preparation needed for bromide opals and paper that are to be worked up in black and white—if so, what? 3. What colours are needed, and how prepared, for working in black and white? 4. Is brush or stump used for face?"—1. Between the lens and paper. For the best effects, the mask should be kept moving during the exposure. 2. No. 3. Ordinary water colour. 4. A brush, unless chalks are used, then a stump, for softening, is required.

*** OWING to the great pressure on our space, we are compelled to hold over several interesting articles and other communications.

CONTENTS.

	PAGE
OUR FORTHCOMING ALMANAC	753
THE DEFENCE OF PHOTOGRAPHIC COPYRIGHT	753
DEVELOPING ORTHOCHROMATIC PLATES	753
PHOTOGRAPHIC IMPRESSIONS AND FINGER-POSTS. By HECTOR MACLEAN, F.G.S., F.R.P.S.	755
CARBON JOTTINGS. By LESLIE SELBY	757
"A BLIND LEADER OF THE BLIND" By A. HORSLEY HINTON	759
PHOTOGRAPHERS' COPYRIGHT UNION ANNUAL MEETING	760
EXHIBITION OF THE PHOTOGRAPHIC SECTION OF THE STANLEY SHOW	761
THE EXHIBITION OF THE HACKNEY PHOTOGRAPHIC SOCIETY	762
OUR EDITORIAL TABLE	763
NEWS AND NOTES	763
MEETINGS OF SOCIETIES	764
FORTHCOMING EXHIBITIONS	766
RECENT PATENTS	767
CORRESPONDENCE	767
ANSWERS TO CORRESPONDENTS	768

THE BRITISH JOURNAL OF PHOTOGRAPHY.

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THE ALMANAC.

The British Journal Photographic Almanac for 1896 is now published. It consists of 1364 pages, and is the largest yet issued.

The frontispiece is a portrait of Sir Henry Trueman Wood, M.A., President of the Royal Photographic Society, the negative having been taken by Mr. W. J. Byrne, and the prints made by contact on gelatino-bromide paper by Messrs. Morgan & Kidd, of Richmond.

The editorial articles are respectively devoted to *Miscellanea on the Cognates of Photographic Optics*, a series of eighteen chapters dealing with points of optical theory and practice, and *The Wet Collodion Process*, which is fully described in sixteen chapters.

Among the contributors to the volume are Mr. W. B. Bolton, Mr. Redmond Barrett, Mr. R. Child Bayley, Mr. Thomas Bedding, Mr. Thomas Bolas, Mr. C. H. Bothamley, Mr. R. H. Bow, Mr. W. Brooks, Professor W. K. Burton, Mr. Francis Cobb, Mr. E. W. Foxlee, Mr. A. Haddon, Mr. A. L. Henderson, Mr. J. A. Hodges, Mr. Chapman Jones, Rev. F. C Lambert, Dr. R. L. Maddox, Rev. T. Perkins, Mr. H. S. Starnes, Mr. W. J. Stillman, Mr. J. S. Teape, Mr. G. Watmough Webster, Mr. C. Ray Woods, and over a hundred others.

It should be stated that the lamented death of the Editor of the Almanac, Mr. J. Traill Taylor, took place after the work was completed and was passing through the press.

CARBON PRINTING WITHOUT TRANSFER.

But for the "transfers"—one or two—the carbon process would, probably years ago, have been the universal photographic printing process; not alone on account of permanence, but by reason of its extreme simplicity. If the transfer operations could be dispensed with, and the image developed—provided the gradation of tones were perfect—direct on the pigmented paper, the carbon would be the simplest and most easy of manipulation of all the printing methods.

In the very earliest days of the carbon process it was pointed out by Burnet, Blair, and others, that in order to obtain prints with a perfect range of tones, from the highest lights to the deepest shadows, the image must be developed—that is to say, the unaltered gelatine washed away—from the reversed side to that which was exposed to the light. The method first adopted to attain this end was to coat one side of fine and thin paper with the pigmented gelatine, and then make the exposure through the paper and wash away the unaffected coating from the other side; but, as might have been expected, the finished picture left much to be desired, as the fibre of the paper showed conspicuously, and very materially interfered with the sharpness of the image. At that time sharpness and crispness of the image was a more important *desideratum* than it is with many at the present time. To get over this difficulty, various materials were used as supports for the gelatine instead of plain paper, such as tracing paper, waxed paper, talc, collodion, &c.; but, as a little consideration will show, with all of them there were drawbacks which rendered the process unsuited for general every-day work, and, moreover, it was necessary, if the image was to appear as in nature, that a reversed negative—that is, reversed as regards right and left—was imperative.

The carbon process only became practicable on a commercial scale when Mr. Swan introduced his process by which the exposed print was transferred from its original support to another of a temporary character for development. That, of course, involved two additional operations, or a reversed negative in the case of a single one. If the reversed negative could be dispensed with, the carbon process by single transfer would be far more generally employed than it is, both by professionals and amateurs. It is the reversed negative, or the double transfer, that has always been the *bête noire* of the carbon process.

At the last meeting of the Royal Photographic Society, Mr. Valentine Blanchard described a method of carbon printing without transfer. The method is to render the paper support of the carbon tissue temporarily translucent, so that the translucency disappears when the print is finished.

The system is this. The sensitive tissue is immersed in a petroleum oil until the paper is saturated, the gelatinous coating being unaffected by the oil. After the superfluous oil has been removed, the tissue is exposed behind the negative, with its paper side next it. The exposure is necessarily long—three times that required when the tissue is exposed in the usual way—because the light has to pass through the paper, and that is stained by the bichromate to a non-actinic colour. It was mentioned just now, in reference to the earliest carbon work, that in printing through paper, whether translucent or otherwise, its texture must show in the pictures, and the finest detail in the negative be lost. This Mr. Blanchard pointed

out the other night, and and told the meeting that the system was only adapted for broad effects, and not for small work or where fineness of detail is necessary. But that will be an advantage rather than otherwise with the majority of the "impressionist school" of photographers.

Our older readers will doubtless remember that, some five-and-twenty years ago, the late Mr. Wm. Blair, of Perth, a pioneer of carbon printing, and one of the first to point out the necessity of exposing on the one side and developing from the other, devised a method of making the paper of the tissue temporarily translucent in such a way that it regained its normal state by the time the picture was completed. The method was published in a pamphlet Mr. Blair issued on pigment printing shortly before his unfortunate death. It was this. The tissue was made on thin and fine paper. It was sensitised by floating the gelatine side on the bichromate solution, so that the paper itself was retained as white as possible. When dry, the paper was saturated by brushing with turpentine or other volatile oil. After blotting off the superfluous turpentine, the tissue was ready for printing, the paper side being placed next the negative. By the time the print was developed and dried, the turpentine had evaporated and left the paper in its pristine condition. Full details for working the method, taken from Blair's pamphlet, will be found on pp. 293-4 of our volume for 1869.

The system received no practical application at the time, principally, perhaps, because nothing but the finest detail was then tolerated in a photograph, and that it was impossible to obtain under that method of working. The case is, however, somewhat different now, and maybe it will prove useful in the production of carbon pictures in which broad effects rather than fineness of detail are the chief considerations. It must be borne in mind, however, that the system of printing through the paper backing does not avoid the necessity of a reversed negative. That is as essential with this method of working as it is with the single-transfer process of carbon printing.

THE REVERSED NEGATIVE PROCESS IN PRACTICE.

Our recent allusions to the reversed-negative process have brought us a considerable number of letters from those who, trying the method for the first time, are surprised that they do not succeed at the very outset. We have all along said that the development of the image—the first image—in this process requires a good deal more judgment, and is a far more "ticklish" operation, than is the case with an ordinary negative, for the simple reason that the ultimate result is in no way represented by what appears to the eye, at least not in the direct manner that it is in ordinary development. We cannot therefore say we are at all surprised to hear of failure on the part of those who have taken up the task under the impression that it is in no way a departure from usual practice except so far as concerns the simplest part, the solution or removal of the reduced silver after the first development.

We may take one correspondent's case as a typical one, although he differs from the majority in being willing to attribute his failure rather to himself than to the process. From his letter it appears that he prepared a special bromised collodion, containing sufficient bromide in each ounce to fully convert fifteen grains of silver nitrate. As a photographic film for ordinary purposes, he says, nothing could possibly be wished better in the way of delicacy, gradation, or density, with an absolute freedom from any tendency to fog or veil; in fact, he found it practically impossible, even under forced development, to fog the shadows; but, on applying it to the reversal process, he failed entirely. A full exposure was given, and the development was pushed far beyond the ordinary point of sufficient density; in fact, until the shadows and half-tones were completely merged one into the other, and only the high lights, represented by perfectly clean bromide and the most delicate gradations were distinguishable. The development was continued until the picture began to be visible at the back, but it was impossible to force it far enough to show the half-tones and finer gradation. After removal of the first image, the plate had the appearance of an undeveloped one, and only on holding it up to a good light was any trace of an image visible, but with a layer of bromide of silver in the deepest shadows quite thick enough to form the high lights of a negative. We have before us as we write one of this correspondent's attempts, and it fully bears out his description of it, reminding us more than anything else of the porcelain transparencies in vogue forty years ago for decorative purposes.

The explanation of this failure is very simple. The film, a more than ordinarily "robust" one, even for ordinary purposes, is far too rich in silver for a process that requires a rather thin and delicate one, depending as it does for success upon the tolerably approximate adjustment of the proportions of silver, reduced and unreduced, in the formation of the first image. The ideal film would be one of such a thickness that the high lights—or what will eventually give way to form the high lights—just reach through to the glass under the action of ordinary development; but such an ideal will never be attained until our subjects present a uniform and unvarying series of gradations. As it is, the nearest approach we can make to the ideal is to provide a film that, for the ordinary range of half-tone subjects, requires not much forcing to carry the action of the developer through the whole thickness, so as to leave clean glass when the image is removed. In ordinary work the thickness of the film beyond a certain necessary point is a matter of no moment, as all excess of unreduced bromide is removed from lights and shadows alike; but in the reversal process it is just this excess that forms the most important part of the film's contents. As a rule, it will be found preferable rather to err slightly in the direction of too thin a film, as even in half-tone work—we are speaking now of natural, not "process," half-tone—any want of density in the final image can be made up by intensification. For "process" work or subjects in black and white the use of a thin film removes every difficulty, as there are no half-tones to study, and all that is requisite is to carry the blacks right through to the glass, and, however thin an image—in moderation, of course—is left after treatment with the iron or acid solution, it can be intensified afterwards.

The specimen sent by the correspondent referred to above illustrates clearly how small a proportion of the silver bromide contained in an ordinary film is actually concerned in the formation of the image; for, although, as has been stated, a more than usually dense image has been removed, there still remains in the thinnest portions of the plate a sufficient layer of silver bromide to produce, under proper treatment, an absolutely opaque image. Those who are familiar with the working of this reversal process too will bear us out in saying that the thinnest and most delicate-looking images, when in the bromide-of-silver condition, are capable of conversion to any degree of density; in fact, one of the first difficulties of the process is to disabuse one's mind of the idea, that in order to

get a dense final image a thick layer of silver bromide is required.

In actual use with the bath, it is not advisable to exceed the strength of bromising mentioned by us recently, namely, three grains of bromide of ammonium and four of bromide of cadmium to each ounce of collodion, though, as we there stated, these quantities may be advantageously reduced. Using, however, the full quantities named, each ounce of collodion is capable of converting a very little over nine grains of nitrate of silver, so that it will be seen that our correspondent's collodion, with a converting power of fifteen grains, is really about twice as thick as it should be. Even in the case of an emulsion in which the constituents of the film are not so fully submitted to the powerful action of free silver, and which, consequently, does not so readily "run to density," the above proportions of bromide are ample, and here also, for easy working, we should prefer a somewhat lower strength. In applying these remarks to a bromo-iodised collodion, it must be borne in mind that the iodide is comparatively useless, and the calculations must be based entirely upon the quantities of bromide used.

Now, as regards development, from something that has been said, the idea appears to have taken root that it is absolutely necessary to carry the action of the first development to the stage of fog, that is to say, that the development cannot possibly be sufficient if the image remains visible and clean. Nothing of the sort; if it be necessary to fog the plate, that is, to produce a layer of reduced silver on the surface in order to carry the development through to the glass, it is only evidence that the film is too thick, presuming, of course, the exposure has been sufficient; and, in thus fogging the plate, we are taking off from the surface some of the excess of silver that cannot be removed from the under side. As a matter of fact, with a film of proper thickness and correct exposure, the development is precisely similar to that of an ordinary negative, and presents no greater difficulties; these only come with an over-dense film and with considerable errors of exposure. Under-exposure, under any circumstances, curtails the depth to which the light, and consequently the developer, can penetrate, while over-exposure has a precisely contrary effect and tends to generally thin the image.

What we would say with regard to fog in the first development is that it does not necessarily detract from the good qualities of the negative, and in some circumstances may improve them; but, like everything else, it must be used with judgment. If the film is known to be rather thick, then the development may, with advantage, be continued until the surface is considerably veiled; but this gives rise to the difficulty, that the final judgment is left practically to guesswork, since, from the comparative transparency of collodion films, the fog so mixes itself up with the rest of the image that it is almost lost, and neither from back nor front, nor by transmitted light, can any really accurate measurement of its value be drawn. With a gelatine plate, although fog may hide the surface image, the general progress of development may be gauged either by looking through or at the back of the plate; but not so with collodion. Hence we lay stress upon the avoidance of fog as far as possible.

To sum up the requirements for the practice of the reversal process, a thin film is required in the first instance; that having been arrived at by careful trial, the rest will be easy, and development will prove almost as easy as under ordinary negative circumstances.

Some of our correspondents complain of the slowness of action of the iron alum, and prefer nitric acid. A week or two back we should have scouted the idea as nonsensical, since we have always found the action as rapid as fixing, that is, nearly instantaneous. But only a few days since we received a fresh sample of potash iron alum. This, at best, is a very unstable compound, and may be so much oxidised as to have very little solvent action left. Ammonia-iron alum is the agent to employ, being both more stable as well as more energetic. A sample we have had for some years, when used, sixty grains to the ounce, clears the plate almost instantaneously.

Photography and the Planets.—A scientific contemporary remarks, on this topic, that "The photographic method of searching the celestial vault has made great strides in recent years, and when all the photographic telescopes are in use we may expect that the map of the heavens will present some features which would have astonished the astronomers of bygone days. In the last five years over 100 planetoids have been added to the list, mainly by the aid of photography."

The Rupture of Glass Surfaces by Gelatine.—We have, on a previous occasion, noted the effect of a gelatine coating upon the surface of a sheet of glass; a film of a certain thickness being placed upon it, dried, exposed to a gentle heat, the gelatine exercises such a pull, by its contractile action, that portions of the vitreous surface are pulled away, leaving behind a variety of arboraceous patterns. It is now suggested to treat a portion of the surface only in this manner, and leave a pattern of clear glass behind. It is evident that very beautiful arrangements could be devised for combining with photographic transparencies these fernlike borders or designs.

A New Test for Platinum.—It may be remembered that, some little time ago, a well-known experimenter stated at a photographic society's meeting that no platinum whatever was discoverable in a print on P.O.P. toned by platinum. It is possible, however, that if he had been in possession of a test described at the Chemical Society by Mr. Edward Sonstadt a different result might have been obtained. Mercury, when agitated with a solution of a platinum salt, precipitates the platinum, as it does also many other metals. Perfectly pure mercury must be employed, so pure that it leaves no stain when volatilised from a white porcelain surface—the interior of a crucible, for example. The mercury should be agitated for a time with the solution of the salt, and the whole gently heated to drive off the moisture. When a greater heat is applied, the mercury is driven off and the platinum left behind. So extremely delicate is this reaction, that one part of platino-chloride of potassium in three million parts of water may be detected.

The Metric System.—It would seem as though the metric system of weights and measures was in measurable distance of coming within the range of practical problems. A large, powerful, and representative deputation recently waited upon the First Lord of the Treasury to express their views on this subject. They were not content with stamping with their approval the universally permissive employment of the system in this country, but they would have it compulsory—more than that, almost immediately compulsory. Their recommendation was that it should be made the national and only legal system of weights and measures to be employed in Great Britain and Ireland. Now, a well-known proverb instructs us to the effect that a preliminary walking accomplishment should precede practice in running, and it is impossible to believe that in two years' time the public could be so initiated in what to the majority of them still is the mystery of decimals, as to be able to make use of metrical weights and measures without a far longer preliminary walk in the subject than a two years' preparation. Meanwhile, if all publishers of formulæ, plate-makers, and others

were universally to make a practice—as already a few do—of giving duplicate metrical equivalents, they would be making a step in advance, and aid in paving the way to the introduction of the inevitable. It has many grave disadvantages, and some of our own units are more convenient; but, as we cannot hope to invent a new system that has the slightest probability of superseding that adopted by so many Continental countries, we may as well conform, and adopt that which has so many undoubted advantages.

Unbreakable Glass.—Very little is now heard of glass toughened by the De la Bastie process, though such vessels as beakers, that may be dropped upon the floor without injury, are obtainable at the dealers in photographic and chemical apparatus at a price little above that asked for the ordinary frangible kind. But much more recent has been the introduction of glass vessels still more resistant to rough usage through the use of varieties of Jena glass. We are familiar with the use of this material of various characteristics for optical purposes, but from a recent report by Dr. Schott, we find that a variety of articles are now made of combinations of two or more layers of Jena glasses, melted together as it were. He finds that of two layers of glass with different expansive powers after cooling, that with the greatest expansion will be in a state of tension and the other in a state of compression. Further, he notes that when advantage is taken of this property by making vessels of this double glass, that glass with the greater compression being the outermost, a great increase in the power of resisting mechanical action and sudden changes of temperature is brought about. Every one is familiar with the damage a flask is liable to when partly filled with liquid a naked flame plays upon it; too often a breakage results. But with the double Jena glass flasks most of this danger is obviated. They may be heated to 184° C. and then sprinkled with cold water and yet come unscathed from the ordeal. Thermometer tubes are also made in a similar manner, normal thermometer glass being autogenously soldered, as it were, to an aluminous sodium borosilicate glass, the coefficient of expansion of the latter being only about two-thirds that of the former.

WHO IS THE INVENTOR OF THE KINETOSCOPE?

The kinetoscope is a scientific toy, with which most persons are now acquainted, if not familiar. It has been extensively exhibited for some time past, not only in London but in all the leading provincial towns throughout the country; and wherever it has been shown for the first time the newspapers have set their busy pens to work upon it, and Mr. Thomas A. Edison has again been deluged with eulogistic ink. But is Mr. Edison entitled to this praise? Doubt has frequently been cast upon his credit as the originator of some of his alleged inventions. In the present case I think I shall be able to show that, if he really lays claim to priority in the invention of the kinetoscope, he is most decidedly sailing under false colours.

For the benefit of those who have not made acquaintance with the kinetoscope, it may be said that by means of it photographs of moving objects can be viewed, as it were, in motion. The way it is done is as follows:—By means of the kinetograph (which forms part of the invention), a number of exposures of some moving object, say a person running or dancing, are made per second. Each picture, as in the old wheel of life, differs slightly the one from the other. Thus, in taking a single step, the person may have been seized by the photographic lens in ten or more slightly varying positions. From these negatives transparencies are printed on a long strip of celluloid. When this strip of pictures is passed rapidly in front of the eye, with a slotted disc moving in the contrary direction, the blending of the pictures is such that the figures depicted have every appearance of moving. Indeed, when looking at the combination, it is difficult to realise that one is not watching the actual scene itself, so real is the effect produced.

Such is the combined kinetograph and kinetoscope, the idea of which, Mr. Edison informs us on his bills, was conceived by him some four years ago. It is quite possible that Mr. Edison worked this out for himself, as said, within the last four years; but the fact remains that a well-known London photographer, Mr. W. Friese Greene, in October, 1889, patented an instrument which produced a similar effect. It was commented upon at the time in the *Optical Magic Lantern Journal*, in the November of that year, and from thence notices appeared in many of the London and provincial dailies.

The article in the journal above named contained the following passages:—

"It would also appear curious to have a street scene depicted on the screen, and for the spectators to witness the various horses and vehicles running past in all directions, persons walking to and fro, and dogs running along, all at varying speeds and with lifelike motion, and not go past in a gliding manner—all this, not as silhouettes, but with all detail.

"Strange as all this may seem, it is now an accomplished fact, and the optical lantern will shortly be considered a *sine-quâ-non* as a recording instrument.

"Imagine the sensation that would be produced if the whole of the recent Lord Mayor's show were to be presented upon a screen exactly as seen by a person stationed at one particular point looking across the street. . . . .

"This instrument is pointed at a particular moving object, and by turning the handle several photographs are taken each second. These are converted into transparencies, and placed in succession upon a long strip, which is wound on rollers and passed through a lantern of peculiar construction (also the invention of Mr. W. F. Greene), and by its agency projected upon the screen."

Amongst other newspapers the *Daily News* (November 15), and *The Photographic Art Journal* (December 2), quoted from and commented upon the above article in the *Magic Lantern Journal*, which, in a subsequent number (April 1, 1890), gave further particulars of the invention, with diagrams.

Mr. Greene's provisional protection was applied for on June 21, 1889, and was granted on October 12 in the same year. In his provisional specification the patentee says: "Our invention has for its object the formation of photographic pictures, and relates chiefly to the production of such pictures as are necessary to illustrate and register the movements of animals, insects, or moving objects, either taken singly or in masses as may be desired. For this purpose we construct an apparatus by which, with a single camera and lens, a rapid series of such pictures may be taken, and by which a series of fresh photographic sensitive films, or portions of such photographic films, may be substituted for those which have been exposed to the action of light with sufficient rapidity for the desired end." The complete specification for this invention was accepted May 10, 1890.

In the interval between this date and the end of 1893, Mr. Greene's mind was busy with a further development of this idea, and on November 29 in that year he applied for a provisional protection for "Improvements in Apparatus for exhibiting panoramic, dissolving or changing views, and in the manufacture of slides for use therewith;" and in the further description of his invention the patentee says: "My invention relates to that class of apparatus which is adapted to throw, by means of suitably arranged lenses, enlarged representations of photographic or other transparent pictures upon a screen or background, and the primary object of the invention is to produce street or other scenes (including particular scenes that change, either by the movements of objects or by alterations of colours or tints), at the back of the stages of theatres, that is to say, to produce by means of reflected light artificial scenery to take the place of the ordinary scenery or background."

The specification further says: "When it is desired to represent a street or other like scene with the continually changing effects due to the movement of persons, vehicles, or other objects, the slide, band, or strip, will bear a series of transparencies taken from an actual street, or the like, in rapid succession. Each photograph of the series will represent a complete picture, but each photograph will differ in some slight detail from the one preceding and following—depending on the interval which is allowed to elapse between the exposures. This series of photographic transparencies can be thrown on to the screen so as to represent the continuous changes in its appearance.

"The continuous slide, or band, or strip of transparencies is caused to travel intermittently through the lanterns, and may be unwound from a roller and wound upon another roller, or it may be an *endless band*, so that view after view can be exhibited for as long a time as may be desired, and the intermittent movement should be given to the band when one of the cylinders before described completely shuts off the light."

The complete specification for this "improved" invention was accepted November 29, 1894.

The instrument which does all that is here described is in reality a combined camera and lantern, the same thing as Mr. Edison's kinetograph and kinetoscope. In outward appearance it is not unlike an American organette—handle and all—about a foot square.

When a band or film has been filled with pictures—I have seen such strips of moving scenes in Hyde Park and on the river—it is taken out and developed, and transparencies taken from it. It may then be reinserted on rollers in the instrument, and by means of the

ectric or other light its successive pictures thrown upon a screen nlarged to life size if necessary), by the simple movement of the andle.

It is a curious fact, and negative proof, at least, of Mr. Greene's riority of invention, that Mr. Edison has not protected his invention n Great Britain. A. T. STORY.

COLOUR (?) PHOTOGRAPHY.

[American Journal of Photography.]

AMONG the hackneyed subjects that form the stock in trade of the ensational journalism of the present day, none is more frequently called pon for duty than the announcement that colour photography is now an ccomplished fact, and that Mr. So-and-So or Dr. This-and-That lately lemonstrated the fact before the Solar Tripod Club, or that Professor Gotitall was awarded a premium of a million lire for his experiments before the Imperial Academy, and so on. It is always the same old story, only that the names and locality are varied occasionally. So common has the announcement become of late, especially in the "Sunday papers," that persons who have any knowledge of photography pass it over without further notice.

As a general rule, the photographic press both at home and abroad has handled these periodical announcements with great discretion and care so as not to mislead the general public

During the past month, however, an exception has been noted, and, strange to say, it appeared in our esteemed contemporary, the staid Anthony's *Bulletin*, wherein we are told among other things that:

"The dream of Daguerre is at last realised. Both he and his partner-inventor, Nicephore Niépce, wasted the best portion of their lives in the vain endeavour to fix the beautiful colours of nature seen on the ground glass of the camera. . . . . The problem has at last been solved, and what was considered impossible but so few years ago is now in practical use."

Now, this startling announcement certainly sounds very well, but who is the inventor and where are specimens to be seen? Has a company been formed as yet to work the process commercially? If so, where can any stock be had, and at what figure? Would the inventors or controllers of the process be willing to let a few members of the photographic press in on the ground floor? All of which are pertinent questions in view of the great value of the heralded discovery. Personally, we would like to "catch on" and get in before the door closes, as we have a family dependent upon us and the winter is close at hand.

During war times, way back in the sixties, whenever a startling announcement of a victory was made, conservative papers would supplement their headlines with one less prominent, "*Important if true.*" The same applies to the announcement made by our esteemed contemporary.

Now what are the facts of the case? How much foundation is there in the above positive statement? Not a particle, so far as the solving of the colour problem is concerned.

As a matter of fact, we are as far from solving the problem of colour photography (or, to be properly understood, the permanent fixation of the image as it appears in its concentrated colour on the focussing screen) as we were the first day when Daguerre demonstrated his process, on August 13, 1839. Now, why deliberately attempt to deceive the public? A photographic periodical should be the last to stoop to such unwarranted statements.

Thus far the colour problem has not been solved. It appears just as impossible as it ever was, nor is it in practical use, as stated in the *Bulletin*.

Triple projections by aid of a lantern are by no means "colour photography," and even in the best of these the colours are a great way "off," and it is a disputed question whether the same view can be projected twice in succession with the same shadings of colour. Then, the triple impressions made with three tints on the printing press are certainly not "colour photography." It is chromo-typography, pure and simple, no matter what fancy name is given to it. Then, again, there are certain difficulties that present themselves to the colour printer with our present inks that are hard to overcome. No matter how great care is taken, either in the preliminary photographic work or in the presswork, so uncertain and accidental are the results obtained by this three-colour process, that, according to the best judges, only about *one* out of a thousand impressions* meets all the requirements of a faithful reproduction of the original colours. This is apparent in the specimen which forms the frontispiece to the current number of the *Bulletin*. It is a pretty chromo, but the cow with a purple face is certainly not in the colours of nature, and yet, so far as the photographic part is concerned, the writer knows of no one who can surpass Mr. Stewart at making the preparatory triple negatives.

This specimen, we acknowledge, is as fair a one as can be made with half-tone plates and triple impressions, yet it falls far short of the chromolithographs such as Prang's, which are produced without the aid of photography.

A few words on the Lippmann process. Interesting as his results may be to the scientist, plates that have to be viewed through a prism to obtain any idea of colour, and then either complementary or inferential, was by no means colour photography. A diligent search by the writer in Paris, London, and Germany failed to bring to light either a specimen or even a living witness who was willing to declare that he had seen a "Lippmann" specimen that came anywhere near fulfilling the requirements of colour photography.

No; the colour problem is by no means solved, nor is the solution of the problem even in sight. JULIUS F. SACHSE.

* *Photographisches Archiv*, No. 774, p. 220.

DOINGS AT THE CAMERA CLUB.

IN our last *Doings at the Camera Club* we noted that Mr G. P. Newman was down for *The Struggle in the Dark Room.*" What a grand title for a melodrama. We could imagine Mr. Newman attired as a bandit, with a belt full of pistols, and with his luxuriant crop of hair deftly curled. We can imagine this struggle to the death, possibly with a brother bandit, in the darkened room, and can almost hear him saying, "Aha, this is the forty-second time he hath attempted my life, I begin to think he means me mischief." But this was not the case by any means. The only thing at all blood-curdling about the paper read by Mr. Newman was the title; all the rest was as innocent and nice as curds and whey, butter-milk, junket, syllabub, or any of those mild libations which are associated with an unruffled pastoral life.

Mr. Newman was evidently rather dissatisfied with the title of his paper, for he amended it, when he began to read his manuscript, by adding the words, "and elsewhere," from which it would seem that Mr. Newman is engaged in a continual struggle against fate. In one sense he is, for his daily occupation is the copying of oil paintings—in sunshine and in rain, in fog, as well as that aggravated form of mist known as a "London particular," he must be up and doing, at work either at the public galleries, or at painters' studios. As the negatives and pictures he showed were exhibited by permission of Messrs. Dixon & Son, of Albany-street, we assume that Mr. Newman has the care of that part of their business which relates to the reproduction of oil paintings. To Messrs. Dixon is the credit due of first showing the public the value of isochromatic plates for copying pictures in colour. Year after year, at a time when the ordinary photographer was quite ignorant of the use of the colour screen, Messrs. Dixon showed at Pall Mall how such pictures could be reproduced by photography with their colours expressed, as a good engraver would endeavour to do—that is to say, with the blues as shades of grey, the yellows nearly as bright as white, and the reds a far lighter tint than an ordinary photograph could achieve. The Dixons were indeed pioneer workers in this important field of photographic work, and they deserve every credit for what must have been, in those days, uphill work which was only appreciated by the few. We gather from Mr. Newman's remarks that they have about as much of this kind of work now as they can well undertake. They certainly have earned success.

At the end of March, said Mr. Newman, there are the Academy pictures to get through. From studio to studio he goes, many days before the "cards to view" are printed, a privileged spectator of those works which all London will be criticising a few weeks later. If the weather be clear and bright, the work is pleasant enough, no doubt, but, when London puts on its yellow, smoky mantle, a gloom also settles upon the heart of the picture-copier. He uncaps his lens, reaches for the nearest chair, and the best thing he can do is to go to sleep. There is no fear of over-exposure under such conditions, and the light is so yellow that one can almost dispense with the screen of that hue. All this is, however, preliminary to the "struggle in the dark room," which did not turn out to be a very serious encounter after all, unless it refer to the large size of the plates used by Mr. Newman, who balances a 20×16 or even larger negative, on his finger tops as easily as an expert cook tosses a pancake of half that area. Mr. Newman invariably makes two exposures of each subject, so as to be on the safe side, and one is given a quarter more time than the other. If one of them is correct, he manages by judicious development to make the other negatives equal to it. He uses pyro and ammonia, and, in spite of what others have written and said, he argues that he can get any amount of control over his results by ringing the changes on the quantity used of these two agents. As an example of his procedure, he showed four negatives. The first three were developed with one grain, one and a half grains, and two grains of pyro to the ounce respectively, the same amount of bromide and ammonia being used in each case. The three negatives were very different in appearance. The fourth of the series was developed quite differently, and he claimed for it a peculiar delicacy of gradation which was absent from the others. In this latter case he used half a grain of pyro to the ounce of developer, and gave the plate a long soaking in the mixture, which had bromide added to it. The alkali (ammonia) was then added in very small doses, with the result stated. The exposure on a dark day must be a matter of mere guesswork, and he regretted that Messrs. Hurter & Driffield had not yet devised a fog-meter. He was careful to keep all solutions at the same temperature, and did not believe in mechanical development, unless the exposure was exactly right. This is really the gist of what Mr. Newman said, and barring a certain tendency to grandiloquent digression, his paper was a useful one.

As is often the case, the discussion was as interesting as the paper

itself. Mr. Haité, who is well known as a rising artist, not only as a painter, but as a worker in black and white, made a very interesting speech, and quite agreed that no one should attempt to photograph pictures unless his colour sense was educated. He pointed out that, although parents were careful to train the minds of their children in every other way, no attention was paid to the important matter of colour. As a result, it was difficult to find three persons who could agree as to the hue represented by any particular shade of colour; but, when Mr. Haité entered into the matter of dark-room struggles, he was altogether at sea. He owned that he had never taken a photograph, so that there is some excuse for him. He praised Mr. Newman's work, and seemed to think that that gentleman had obtained, by education of his colour sense, a control over the development of a plate not possessed by others, and spoke of suppressing certain parts of a landscape negative, and bringing out other parts in a manner which is certainly impossible during development, whatever may be done in the way of manipulating the negative and modifying the results it gives by judicious printing. The Rev. Mr. Lambert, who occupied the chair, also enlarged upon the importance of cultivating the colour sense, and remarked upon the futility of the old-fashioned tests with coloured skeins of wool. Mr. Newman, senior, very well summed up the whole matter by observing that the arts of colouring chiefly consisted in appreciating the difference in objects of the same colour when occupying different planes with layers of air between them. Mr. Storey, A.R.A., in a pleasant little speech, gave zest to the discussion by an anecdote. He was once called upon to see what was described as a genuine Correggio. He saw at once that the picture was a copy, and a very bad copy, to boot. He called the owner's attention to a particular yellow in the picture, and said to him, "What colour is that?" "Yellow," was the reply, "and a dooced good yellow too." "Ah," said Mr. Storey to him, "if this had been a genuine Correggio, you would not have been able to say what colour that was." After this anecdote Mr. Storey humorously pointed to a picture of his which stood on an easel in the Club-room. It had been brought there for comparison with photographs of it exhibited by Mr. Newman. "Look at that bit of red in my picture," said he. "That's not a pure red; it has a lot of raw umber in it." And so, with a few remarks from the lecturer and the usual vote of thanks, the proceedings closed.

On November 4 the Club forsook its photographic mood and gave itself up to melody and harmony, and it should be recorded that the smoking concert organized by Mr. Webster for that evening was a thoroughly enjoyable one, from the opening song, by Purcell—the bicentenary of whose death occurred in the middle of the month—to the more humorous items of the programme. But this is a photographic journal, and a more detailed report of proceedings having relation to a sister art is barred by a fear of editorial displeasure.

We have already noticed that Captain Abney's lectures on *Light* have been greatly appreciated, and, when the last one was given, on Monday, the 11th, every one regretted that the end had come so soon. We have also pointed out what a picture was formed by the darkened room and the gorgeously coloured light with which the lecturer was dealing, and recorded the fact that an artist attached to one of the weekly journals was present on the occasion to which we referred. The labours of this gentleman have since borne fruit in the shape of a picture which appeared in the weekly *Graphic*—a picture of the Club-room, *An Evening at the Camera Club* is its title—and a very good picture it is. The artist has taken the moment when Captain Abney was performing a very pretty experiment, an imitation sunset. His sun was a spot of light thrown by the electric lantern upon a small screen, and he interposed in its beam a tank of hypo, to which a few drops of acid were added. As the mixture gradually clouded, the imitation sun became yellow, orange, and red in turn, until, at last, it disappeared as we have hundreds of times seen the real orb of day hide itself in banks of accumulated vapour.

The last lecture of the series was not quite so successful as the others, for somehow the experiments did not go off as they should do, and they seemed like unto damp fireworks. This was to be regretted; but, as the poet says that the best of things "gang oft agley," without attempting so explain why they do so, it can hardly be expected of us that we should know better than such an authority; so we merely place on record the fact that Captain Abney's experiments did on that occasion "gang agley." And they seemed to do so out of pure cussedness, for the Captain had two assistants, and had evidently been put to no small trouble in the arrangement of his apparatus. His subject was *Interference*, and, after giving on the blackboard a demonstration of the laws governing the phenomena, he proceeded to experiment with a soap film, and endeavoured to show how such a film reflected the most brilliant colours as it became thinner and thinner, until it burst. Unfortunately, the soap film did not enter into the spirit of the thing, and insisted upon bursting prema urely. Again and again did the lecturer, with admirable patience, draw the liquid over the space prepared for the film, but w/ether it was the tobacco smoke, or a wandering draught of air, or the state of the weather, or the semi-panic on the Stock Exchange, the oft-renewed film was determined to strike, and no work would it do. Captain Abney thought that it would be soothed perhaps by the charms of music, and he produced a penny whistle, upon which he performed a kind of interlude. The film was visibly disturbed; Captain Abney said it was owing to the sound-waves which beat against it; but it exhibited every evidence of extreme torture, and finally burst, as before. The Chairman, Mr. Machel Smith, expressed a hope that Captain Abney would continue to practise on the penny whistle, and would some day promise the members to perform at a smoking concert. He also expressed the hope, in which all present joined, that the Captain would give another series of lectures.

Mr. Lyonel Clark's series of lectures on *Optics and Lenses* have not been so well attended as they might have been, possibly because few can afford the time for two series on technical matters, and Captain Abney's subject was the more attractive one. It is noticeable, too, that the audience was principally made up of the older members of the Club, a thing easily accounted for, however, when it is remembered that the young folk nowadays are so awfully clever, and know everything. Lenses are, of course, necessary to beginners, but they are quite above optics, and so Mr. Clark obtained only scant attendance for his lectures. Perhaps it is the fact, too, that members of the Camera Club hate the blackboard like poison. Captain Abney hinted as much when he began to chalk it the other evening, and Mr. Lyonel Clark was dependent upon that lecture-room appliance for his illustrations. Elementary optics does not admit of much that is new, or of anything one cannot find in the text-books, but it is always interesting to note a lecturer's treatment of even an old, old story, and Mr. Clark's efforts were thoroughly appreciated by those who heard him.

One of the most successful evenings of the month was that of November 21, when Mr. J. H. Knight discoursed of *Mechanical Carriages*, Sir David Salomons occupying the chair. Mr. Knight knew his subject well, and was introduced by the Chairman as one who had recently rendered himself notorious by appearing in a police court. He had been "run in" on the charge of running on the public high road in a self-propelled carriage without limiting his speed to three miles an hour, and without having a pampered menial in advance of him, bearing a red flag. He was fined half-a-crown for this breach of the law, and is now confining his petroleum-driven excursions to his back garden, which is a meadow. "Not a photographic subject?" said Mr. Knight. Perish the thought! Why, at the end of '96, the members of the Camera Club will be driving all over the British Empire in vehicles which will carry cameras of any size, and photographing more than they ever photographed before; the millennium will have arrived when each man will not only sit under his own vine and his own fig-tree, but will drive his own "puff puff." Mr. Knight made a steam carriage more than twenty-five years ago, so that his brain has been haunted by this subject for a long time. He told us what had been done in the past, and what were the prospects for the future. Then the Chairman took up the thread. The lecturer had to leave early to catch a train, having, for fear of police interference, left his *petriolette*, or whatever he calls it, in the aforesaid meadow. Therefore Sir David would open the discussion instead of closing it, as is the custom of one in the chair, and what he said, illustrated by lantern slides, really proved to be the most interesting feature of the evening. He showed photographs of the elegant carriage which he drives round about his home at Tunbridge Wells, and told his hearers of its conveniences and certain disadvantages which he was getting remedied. He owned that he was an enthusiast in the new method of carriage-propulsion, and believed that it had a wondrous future before it. The matter had brought upon him a voluminous correspondence, and some of the letters were of a most amusing description. There was, for example, an application from a Bible-reader, in whose particular line business did not seem very brisk just now, for he wanted to become agent for some petroleum carriage manufacturer. His idea was that, while leaving a tract, he could also secure an order for an "autocar," together with a little commission on the transaction for himself. This little story about the Bible-reader of commercial instincts was, of course, received with a roar of laughter. The discussion which followed the reading of this paper was long but interesting. It had, however, but little bearing upon photography, and probably, if it were here reported, the editorial scissors would make short work of it.

ON A METHOD OF PHOTOGRAPHY IN NATURAL COLOURS.*

[Nature.]

In 1861 Clerk Maxwell described a method of colour photography, based upon his experiments on the theory of colour vision, and made the following experiment. Three photographs of a coloured object were taken through three several coloured solutions, giving images which separately represented the object as it would be seen by each of the three sets of colour nerves postulated by Young. When these were superposed the original colours of the object were reproduced, save for the defect that the red and green components suffered from the insensitiveness of the photographic plate of Maxwell's time to the longer wave-lengths. Maxwell added the remark that when the photographic plate was improved as regards sensitiveness to the less refrangible rays, the representation of colour would be improved.†

Since Maxwell's day the colour blindness of the plate has been

* Abstract of a paper read before the Royal Dublin Society.

† "On the Theory of Three Primary Colours," *Collected Papers*, page 449.

almost completely remedied, thanks to the discovery of Vogel, and it is now possible, proceeding on the lines laid down by Maxwell, to produce by triple projection upon the screen a picture which may be illusively like nature. For the application of modern resources and the suggestion of photographing to the colour vision curves by special colour screens, we have to thank Mr. Ives.

Composite colour photography deals with the subjective reproduction of all visible wave-lengths in two stages; a photographic analysis and an optical synthesis. In the first operation the several wave-lengths are caused to produce three separate photographic images, according to their physiological activity in exciting the supposed fundamental red, green, and violet sensations. That is, if the image bears, for example, a yellow colour (suppose such a yellow as the spectral yellow near the D line), one of the plates must record an image of the object having a density of silver deposit corresponding to the degree in which this wave-length can excite the red-seeing nerve, and a second must acquire a density corresponding to the degree in which this same wave-length can excite the green-seeing nerve. The third plate records no impression, for the wave-lengths near D excite no violet sensation; but this yellow sensation is the resultant of two physiological effects only, a red and a green sensation in certain proportions obtained by colour measurements effected upon normal colour sight. We have now obtained three negatives possessing densities of silver deposit corresponding to the degrees in which the three several fundamental colour sensations are stimulated. These degrees of density will be interpreted as degrees of transparency in the positives. The first positive, if backed with a red glass, will transmit a quantity of red light corresponding to the intensity of the physiological excitation of redness in the "red" nerves; the second, backed with green, similarly represents the stimulation of the "green" nerves by the yellow colour of the object; the third positive is backed with blue-violet glass, but is quite opaque, and no violet light is transmitted through it. The projection now of all three images superposed upon the screen forms the second stage of the procedure; the optical synthesis of the original colours. The eye regarding the superposed image receives, in fact, the same amounts of red and green sensation, and experiences the same absence of violet sensation which would have attended the formation of the image of the original object upon the retina.

This process, if accurate reproduction of colour is sought, necessitates the use of two distinct sets of colour selective screens; for the analysing screens will by no means possess the tints ultimately required in the optical synthesis. This is evident, since the measurements on colour vision reveal that the wave-lengths near D are more strongly stimulative of red sensation than are the purely red exciting wave-lengths near C, and the wave-lengths again diminish in their power of producing stimulation of the "red" nerves on the more refrangible side of D. Hence, in order to photograph the wave-lengths of the spectrum, we require to produce a greater photographic effect by the D wave-lengths than by the C wave-lengths, and a photographic effect diminishing above D in the same degree

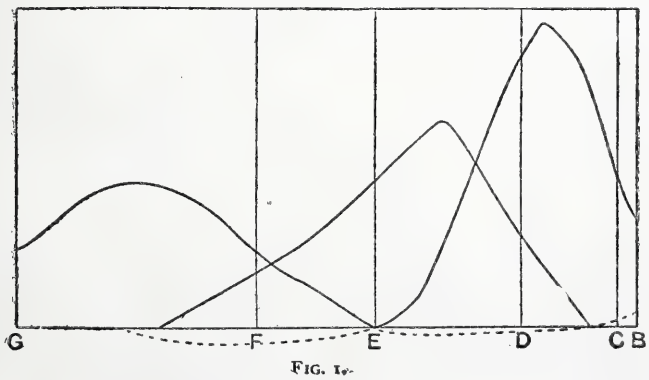


FIG. 1.

as the power of the waves to excite the fundamental red sensation diminishes. To effect this analysis of the light, a screen transmitting as predominant wave-length, a wave-length near D, must be used for obtaining the image which is to represent the appreciation of light peculiar to the "red" nerves. Such a screen has a yellow-orange colour, which is not the sensation excited in or transmitted by the "red" nerves. In the optical synthesis this must afterwards be represented by a C red colour. The same remarks apply to the other screens.

Maxwell's curves (fig. 1) are not colour sensation curves (Abney: "Colour Vision," *Tyndall Lectures*, 1895), and it is misleading to speak of the foregoing method as effected on colour sensation curves. Maxwell's curves represent, in fact, the subjective synthesis of spectrum out of three chosen wave-lengths—a red, a green, and blue-violet. The question as to how far one or all these chosen wave-lengths may excite more than the one set of nerves remains over, and indeed can only be gone into by examination of abnormal colour vision. In Kœnig's curves of colour vision, colour sensations are plotted. These are shown in the named curves of fig. 2.

If, from the knowledge afforded by Kœnig's curves of the compound nature of the green sensation, Maxwell's curves be examined with reference to their suitability to serve the purposes of the photographic method, it will be found that, assuming Maxwell's E green to excite the proportionate amounts of red and violet sensation revealed by Kœnig's curves, a correct synthesis of the F green by Maxwell's curves is impossible. Although such a comparison is not strictly allowable owing to the red and violet curves of Maxwell being based on different wave-lengths to those used by Kœnig, the fact of grave inaccuracy is certain. This fact will appear if the

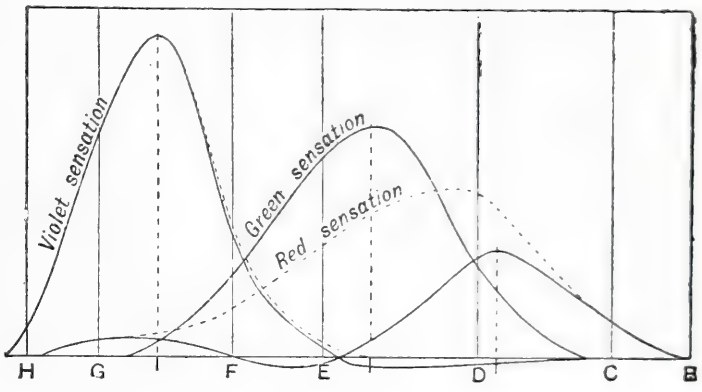


FIG. 2.

spectrum is photographed according to Maxwell's curves. The blue-green will then be found to be reproduced too yellow in tone.

In order to apply the colour sensation curves of Kœnig to the photographic method, we have to find by trial examinations of his curves the green most suitable for backing the "green" positive; for we see that the several green wave-lengths excite very different amounts of red and violet sensation. We find as suitable a wave-length a little to the left side of the E line, about 550 $\mu\mu$. If we take this colour to back the green positive, we must, in order to find the correct red and violet curves which are to control the densities of the red and violet images, replot the red and violet curves with allowance for the proportionate amounts of red and violet which will be carried to all those points where in the image of the spectrum the green curve operates. The red and violet curves must be lowered by amounts obtained by ascertaining from the height of the green curve at any point the amount of red and violet sensations excited by the amount of our selected green present at that point. The final curves are shown in the slightly altered violet sensation curve, the original green sensation curve, and the considerably lowered red-mixture curve (as it may be called); the full line in all cases representing the applicable curves. It is seen that the amount of negative colour (which cannot be realised) is small. Although it is possible that the compound nature of our green sensations will deny absolute accuracy to this method of colour photography, still my own results on the curves just described, and the results of Ives and others on modified Maxwell curves, appear to show that a degree of accuracy baffling the criticism of the ordinary untrained eye may be attained, and that in the reproduction of the most complex tints.

The symmetry of the derived curves renders their application easy. The transmission of light through a pigment is not limited generally to a small group of predominant wave-lengths, but falls off uniformly at either side in the directions of longer and shorter waves. If we choose the pigments used on the analysing screens so that their predominant transmissions are at three points in the spectrum indicated by the axis of symmetry of the three curves, these being nearly symmetrical, very accurate results are obtained. The positions of these axes of symmetry are shown by the vertical dotted lines. Accordingly, I make the colour of the red-taking screen that of the spectrum at a point displaced to the red side of D by about one-sixth the interval D to C; for the green and violet-taking screens the correct tints are found in the same manner by scaling from the figure. Good results are thus obtained, but I do not assert that these details of procedure are final.

Any method of photography in natural colours must possess the characteristics not only of accuracy of colour rendering, but also of

convenience of application and permanency of colour, if it is to possess value as a scientific method. For use under the various circumstances of travel, the naturalist requires a method no more cumbersome than the present dry plate. In the method of composite colour photography, as described, the ordinary camera will not serve. The cumbersome necessity of obtaining three images remains, and subsequently no concrete image in natural colours is actually obtained. One can only be realised by triple projection upon a screen, or by using some optical contrivance which, by the aid of reflectors, enables all three images to be simultaneously projected upon the retina.

I now proceed to describe a mode of applying the foregoing principles which is free of the objection of cumbersomeness, and which enables us to realise a concrete image in transparent colours. A plate is finally produced which may be held in the hand, regarded against the light, and which bears an image of the object in natural colours, or such as are so nearly accurate as to seem so to the eye. In this new method there is but the one image photographed. The ordinary camera, lens, and backs, &c., are used without modification. The first-class isochromatic plates in the market, which are sensitised down to the C red, will give very good results.

In the new method the idea is to carry the application of physiological principles still further, and divide up the plate like a hypothetical subdivision of the retina, so that all over the plate there should be minute regions uniformly distributed wherein the sensitive silver salt is excited to become reduced to the "photogenic" material in the same degree in which the sensations of redness, greenness, violetness, would have been actually excited in the several nerves of the retina had the image been formed upon it. Development builds upon this photogenic material the denser silver deposit, and ultimately in the positive the amounts of the sensations are registered in the degrees of transparency of the successive regions. The lined screen which can bring about this I can show you in the microscope. It consists of closely ruled adjacent lines in orange, green, and violet tints. This screen, applied closely to the sensitive surface, analyses the image in the camera. The screens I have used hitherto are coarse, about 200 lines to the inch, and even with this coarseness will show plainly, I regret to say, the imperfections of the only apparatus at my command in preparing these screens. I may observe, in passing, that the colours are ruled on in pigments made up as inks in gelatine and gum arabic or dextrine, and upon plates coated with a preliminary layer of gelatine. Such lines may be put on so close as 800 or 1000 to the inch. With between 300 and 400 to the inch, however, the eye is no longer annoyed by the structure of the plates. The lines may also be ruled on celluloid or on translucent paper.

The appearance of both negative and positive obtained is interesting. One would hardly at first sight distinguish between them and the ordinary images. But a lens readily shows the difference. Recalling now that the lines upon the positive register in their degrees of transparency the degrees in which the three-colour sensations would have been excited, it becomes apparent that to complete the physiological parallel we must convert these degrees of transparency to quantities of the red, blue, and violet colour sensations. This is done by a second screen, which carries red, green, and violet lines to the same gauge as the taking screen. We apply this to the positive, and as we move it over the image, waves of every tint of colour appear till that position is reached where the red lines fall over the lined areas recording red sensation, and so for the others. The picture now suddenly appears in vivid colour and with all the realism and relief conferred by colour perspective.

A picture of wallflowers taken through a dichromatic screen, the red and green sensations only being photographed, is of interest as realising the appearance of the object to a violet-blind eye. The rich reds and browns appear unaffected; the greens are, however, somewhat unnatural. A photograph of the spectrum shows the range of colour from the C red to the H lines. The blue-green is, however, defective. It was taken according to Maxwell's curves. Photographs of burnished metallic objects, as a brightly lacquered microscope, reproduce the metallic lustre; and one of an uranium glass bowl, reproduces the characteristic dichroism and fluorescent appearance of the glass when seen by daylight. That every shade of colour can be reproduced, however complex, is shown by two portraits, one from life, and one a copy of a water-colour drawing boasting very æsthetic shades of brown and olive. A great variety of bright sunlit colours appear in a view at the Trinity College athletic sports, wherein the scarlet uniforms of the military band, the green of the grass, and the blue sky, recall the vivid appearance of the image on the ground-glass screen of the camera. The colour perspective in such pictures adds greatly to the reality and relief. The faithful reproduction of texture, as in the case of some pansies, where the velvety browns and purples of the originals reappear, or as in the case of the wallflowers, reminds us how much is inferred from the most subtle differences of light and shade in the colours of objects, in association with previous experience derived through other senses. The picture is always an optical illusion; and this additional illusiveness conferred on the photograph by the method invented by Maxwell on the basis of the three-colour theory of vision, is surely a strong confirmation of that theory.

These results are attained by no new photographic operations. It is necessary to use good orthochromatic plates sensitised into the red, and also to have affixed in the lens an orthochromatic screen cutting off the ultra-violet light in the usual manner. The exposure is somewhat longer than the ordinary exposure, for we can of course only use visible light, and of this a part is stopped by the taking screen. The ordinary backs may be used. The displacement of the sensitive film from accurate register with the ground-glass camera screen, owing to the presence of the taking screen in front of it, may be corrected (if thought necessary) by simply reversing the surface of the ground-glass camera screen, turning the muffled side outward. This secures that the image will be accurately focussed in the plane of the sensitive surface. Negatives and positives may be used as ordinary negatives or positives till it is desired to recall the original colours. Thus, for those who wander with the camera, the possession of but the one seeing screen to test results is sufficient, and of course the one taking screen suffices to take an indefinite number of plates.

These considerations lead us naturally to observe that the registration of colour being really carried in the silver image, which with very little care in manipulation may be made permanent, secures that the colours are permanent. A faded screen may at any time be made good by a fresh screen; the colours in all cases being spectroscopically chosen, we are assured of the reproduction of the original colour. In this aspect the necessity of the detached colour screen is no disadvantage, but rather a necessary safeguard against the inevitable fading attending most pigment colours.

J. Joly, F.R.S.

NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Seventh Exhibition of this Society was held at Jubilee Hall, Hornsey-road, N., and was inaugurated by a *conversatione* of members and their friends on Monday evening, December 2.

Presentation to the late President, Mr. J. W. Marchant.

At nine o'clock the President, Mr. J. C. S. Mummery, said that he wished to have the attention of those present for a few moments. He thought that there would be no question but that the Exhibition was an advance on its predecessors. That advance was the result of the years that had gone, and during those years the Society had been fortunate in the possession of so amiable and capable a leader as Mr. J. W. Marchant. They had accordingly taken advantage of that occasion to ask Mr. Marchant to accept a small piece of plate as some slight token of their appreciation of his able advice and leadership.

Mr. Marchant, in reply, said that the announcement came upon him as a surprise. He could only say, with Hamlet, "Beggar that I am, I am even poor in thanks; but I thank you." He had done no more than his duty, but in doing so he had been ably seconded by both of the former Honorary Secretaries, Mr. McIntosh and Mr. Gosling.

The Awards.

The judging at most exhibitions gives rise to dissatisfaction, but this year it seems to have been more than usually erratic. Certificates are awarded to Mr. B. J. Addison for a portrait (No. 10); Mr. P. E. Spencer for *Sketchley Farm in Drear November* (No. 30); Mr. J. C. S. Mummery for *While Deep'ning Shades obscure the Face of Day* (No. 31); Mr. Charles Briggs, *Twilight on the Fjords* (No. 34); Mr. W. Brame Goodwin, *By the Winding Brook* (No. 51); Mr. C. H. Dawkins, *Autumn Reeds* (No. 102); Mr. H. Walker, *Where Moorland Stream draws near the Sea* (No. 131); Mr. S. E. Wall, *The Slow-winged Storm along the Troubled Skies spreads its Dark Course* (No. 135); Mr. A. J. Johnson, *Brunetta* (No. 146). Mr. S. E. Wall also takes a certificate for a lantern slide *Low Tide Below Bridge* (No. 163). The Judges have made a report containing the following observations, with which all who have seen the Exhibition must agree:—"Taking the Exhibition as a whole, we are very favourably impressed with the general excellence of the work shown. The standard is decidedly high, and several workers show conspicuous artistic taste. A few prints are not seen to the best advantage, owing to an unsuitable choice of mount and frame." It is only right to say that while there are some glaring examples of what not to do in the way of mounting and framing, the Exhibition gains much this year by the great general improvement in these important matters.

The Pictures.

No. 1, *On Crymlyn Barrows*, by Mr. S. E. Wall, is one of the most striking photographs in the room, depicting as it does a wild sand-swept expanse, something similar to Wilkinson's *Sand Dunes*, but beneath a brilliant sky, with small floating masses of cumulus here and there in it. The whole print is full of sunlight, and prompts inquiry as to why this one of Mr. Wall's is passed over in favour of No. 135, which is interesting rather as a startling and uncommon cloud effect. Mr. H. Smith exhibits a number of photographs, the subjects of several of which are to be found in the beautiful Vale of Dedham, Constable's country. Dedham, by the way, appears to be quite a favourite haunt of the North Middlesex Society. A number of figure subjects represent Mr. C. Beadle's contribution to the Exhibition. As a series they are very good, but not quite even. "*Don't Tell*" (No. 44), two girls, one of whom has evidently imparted some secret to the other, is one of the best. Of the exhibits by Mr. Briggs and Mr. Spencer, which take awards, the most conspicuous feature is gloom. This is, of course, appropriate, as one represents *Drear November* and the other *Twilight*. Mr. Briggs has been very fortunate; either of Mr. Spencer's other works seem more worthy of recognition. *Slowly Dying Day* (No. 119) and *A South Devon Estuary* (No. 109), by H. Walker, are examples of delicate workmanship and of great taste; in the former the cloud effect, and the long wedge of light reflected from the water, and the wet shore, help to make a very striking view. Mr. A. J. Golding, whose work here one always looks forward to, is represented by but the two exhibits he showed at Pall Mall. They are far from doing justice to his undoubted ability, but it is only fair to him to say that sickness and other causes have interfered with his photography during the past year. Next year let us hope he will live up once more to his reputation. Mr. Mummery, the President, is represented by a number of characteristic photographs, of which No. 18, "*Will it Mend?*" we have already noticed at Pall Mall. There is some striking architecture, to which both Mr. W. Taylor and Mr. Marchant contribute, while Mr. C. O. Gregory sends a frame of four interiors of great delicacy and faultless technique. Mr. Pither's *Sentinel of the Forest* is interesting, but No. 227, *The Picturesque in Building*, by the same worker, bears unfortunately much very aggressive hand work, which detracts from what is otherwise a remarkable photograph.

Space will not permit of the mention of any more of the many excellent pictures on view. Unlike several of its contemporaries, the North Middlesex Photographic Society is content to confine its annual show to the works of its own members, and if by so doing a few exhibition-worn works of merit are excluded, the general aspect of the room is fresher, and the remarkable strength of the Society in the better class of workers is manifested. This year the number of exhibits is a little smaller, but the reduction has taken place from the last ranks, the general average of the Exhibition being a very high one. The Society wisely has determined to give no medal to its members, a plain certificate being the form taken by the awards, and in this, as well as in other matters, sets a good evample. The catalogue of the Exhibition is a neat little work, tastefully printed, and free from errors. Altogether, the Society is to be congratulated on the result of its labours and on the high level attained in this, its seventh Exhibition.

EXHIBITION OF THE LEYTONSTONE CAMERA CLUB.

The Leytonstone Camera Club is doing useful work in its neighbourhood, not only in popularising photography, but in demonstrating the possibilities of photography in the production of pictures of artistic merit. The fourth annual exhibition of the works of the members of the Club and others, which was open to the public on the evenings of Thursday, Friday, and Saturday, the 28th, 29th, and 30th, was fully as successful as its predecessors as regards the pictures shown and their excellence, and those who are responsible for the organization of the Show deserve great praise for the thorough manner in which all the arrangements were carried out, even to the getting up of the catalogue, which was commendably complete in its information.

The nine classes comprised six for the work of members and three open classes, and it is a testimony to the popularity of this Exhibition amongst photographers generally that the latter classes were so strongly supported.

We should like to point out that one of the Rules of the Exhibition appears to act unsatisfactorily as it is at present administered. It is provided that an exhibitor can only take one medal of each value, that is to say, that an exhibitor having received a silver and a bronze medal, however worthy his work may be in another class, it is passed over without comment. This should be modified, so as to allow the Judges to make the awards to the best pictures in each class, irrespective of whether their producers can actually receive the medals or not.

The Judges were Messrs. Lyonel Clark, A. Horsley Hinton, and J. A. Hodges.

In the Members' Class for Landscape and Seascape, A. E. Bailey is awarded the silver medal for *Day is Dawning, and the Sun is Low*, one of five little pictures which are all characterised by considerable feeling, and in which there is commendable variety in the subjects and in their treatment. C. A. Russell, who receives the bronze medal for *Shades of Evening*, is an industrious and conscientious worker; we expect him to improve rapidly. J. H. Barrat's contributions are neat, but the white skies would spoil anything. In *The Roving* he has a good subject, but he has not made the best of it. H. P. Hood has not succeeded in making a picture of *Flatford Bridge* by leaving an abnormal amount of sky, and by employing a printing process for his picture, which seems to emphasise the defects of his negatives, he has placed himself at a disadvantage. M. D. Kerr's pictures have unfortunately been skied; they seem to have deserved a better position. C. Andrews' exhibits are careful work, and they show some appreciation of pictorial value.

In the Class for Architecture, A. E. Bailey's *View from the Choir, Ely Cathedral*, should certainly have been placed highest in the class. His disability to receive the silver medal undoubtedly has obliged the Judges to place his picture second, and award him the bronze. The picture is wonderfully brilliant yet harmonious, and the effect of light and shade charming. The silver medal goes to J. H. Barrat for *St. Paul's from the Choir*.

The Class for Portrait (Figure and Animal Studies) is not a large or a strong one. *Le Cœur brisé*, by A. Hands, has the merit of being a subject which is not a hackneyed one, and it is treated with a considerable amount of feeling as well as technical skill. It is awarded the silver medal. The bronze medal falls to *A Portrait*, by W. J. Battell, which has few claims to special notice. C. Andrews has, among his three exhibits, one which might not unreasonably be described as the portrait of a young lady of considerable personal attractions, overwhelmed with the importance of having a fern growing out of her head, and slipping out of the picture. A. E. Bailey's pictures are landscapes with cattle rather than animal studies.

In the Class for Enlargements, the silver medal is awarded to W. R. Fasey. His *On the Orwell* is a good enlargement, and the subject is pleasing, but the black cloud introduced is eccentric, both in position and feeling. *Hoar Frost and Mist*, by W. E. Hall, is technically a very good enlargement; the relative tones of the original have been well preserved, and it is a pleasing subject—bronze medal. C. A. Russell's *Left by the Tide* is not an improvement on the original.

The silver medal in the Instantaneous and Hand Camera Class has been awarded to J. H. Gear for *A North Sea Fishing Boat*, which has many good qualities for a direct instantaneous picture of so large a size, but is not particularly interesting. *On the Highlands*, by C. Andrews, bronze medal, is one of a series of capital hand-camera views. W. R. Fasey's groups of figures are good, but are of human rather than pictorial interest.

The Judges have awarded two silver medals for lantern slides. They are given to C. A. Russell and F. W. Wates, both of whose series contain work of a very high class. A. E. Bailey is again unfortunate in being passed over; in his magnificent series of architectural slides we should have considered him *facile princeps*.

In the Open Classes, the gold medal of the Champion Class is awarded to Mr. G. Lafayette for *A Study*, the merit of which, as a picture, we cannot deny; but we cannot avoid making a protest against the printing process chosen and the frame in which it appears, and, if Mr. Lafayette wishes to retain his reputation for artistic work, he would do well to refrain from exhibiting that example of the worst kind of artificiality that photography has lent itself to in the past—*Springtime*. Our old friend, Mr. R. Terras's *Ghost Story*, receives another silver testimony to its charm, and Mr. F. W. Wates adds distinction to the Leytonstone Camera Club, as well as to himself, in gaining the bronze medal for his admirable picture, *Ships that pass in the Night*.

The General Open Class was a good one, both as regards quantity and quality. Amongst the well-known exhibitors were Mr. E. Scamell, Mr. E. C. Hertslet, Mrs. A. E. Blake, Rev. A. H. Blake, Mr. H. Tonkin, Mr. H. E. W. Claringbell, Mr. J. H. Coath, Mr. F. Marsh, Mr. G. Lafayette, Mr. W. S. Aston, Mr. G. Hankins, Mr. J. C. Warburg, Mr. A. Jane, Mr. C. Job, Mr. H. Esler, Mr. J. Gunston, Mr. R. Penlake, Mr. S. N. Bhedwar, Mr. J. H. Gear, Mr. A. Debenham, Mr. R. Terras, and Miss Curle. A silver medal was awarded to Rev. A. H. Blake for *The Last Gleam*. Mr. S. N. Bhedwar also receives a silver medal for *From Door to Door*, a weird study of Eastern life. *Gorse and Bracken*, for which Mr. A. J. Jeffreys, is awarded a bronze, is a delightful picture of the class of subject which its title indicates; and *The Ebbing Tide*, by Miss Curle, which receives another bronze medal, is a simple study of breaking waves, admirable in composition and skilful in treatment.

The Apparatus Section included exhibits by Messrs. W. B. Whittingham & Co., R. & J. Beck, the Great Eastern Supply Stores, Mr. E. G. Platt, and Mr. J. Cole, and to Mr. W. E. Lyon was awarded a silver medal for a non-slipping tripod.

Awards:—Class A (3), *Shades of Evening*, C. A. Russell, bronze medal; (27) *Day is Declining and the Sun is Low*, A. E. Bailey, silver medal. Class B (44), *St. Paul's, from Choir*, J. H. Barrat, silver medal; (46) *View from the Choir*, A. E. Bailey, bronze medal. Class C (65), *Le Cœur Brisé*, A. Hands, silver medal; (74) Portrait, W. J. Battell, bronze medal. Class D (80), *On the Orwell*, W. R. Fasey, silver medal; (81) *Hoar Frost and Mist*, W. E. Hall, bronze medal. Class E, (96) *North Sea Fishing Boat*, J. H. Gear, silver medal; (101) *On the Highlands*, C. Andrews, bronze medal. Class F (104), C. A. Russell, silver medal; (106) *Sheep*, F. W. Wates, silver medal. Class G (122), *A Study*, G. Lafayette, gold medal; (131) *Ships that pass in the Night*, F. W. Wates, bronze medal;

(133) *The Ghost Story*, R. Terras, silver medal. Class H (148), *The Last Gleam*, Rev. A. H. Blake, silver medal; (250) *From Door to Door*, S. N. Bhedwar, silver medal; (265) *Gorse and Bracken*, A. T. Jeffreys, bronze medal; (277B) *The Ebbing Tide*, Miss Curle, bronze medal. Class J (278), E. Dockree, bronze medal; (280) *Reredos, Salisbury*, E. R. Bull, bronze medal; (283) *Lake Como*, E. R. Ashton, silver medal; (290, No. 4) Seascape, J. Ward, silver medal. Apparatus, Non-slipping Tripod, W. E. Lyon, silver medal.

Our Editorial Table.

"Amateur Photography: How to Become a Successful Amateur."

By Fred. Hall. London: George Bell & Sons. Price 1s.

Mr. Hall, in a series of clever sketches, some of which are printed in colours, narrates with much unction the experiences of Dallmeyer Ross Jones, Esq., as an amateur photographer. Jones is first inspired with a craving for a camera by reading the *Change and Smart*, and, having obtained possession of the coveted set, passes through quite a photographic purgatory, the ultimate effect of which is the insertion of an advertisement in *Change and Smart*, offering his apparatus for sale on account of the owner being ordered abroad through ill health. Mr. Hall's sketches are not only full of fun—some of them being, like the play of *Charley's Aunt*, "enough to make a cat laugh"—but, by reason of the author's evident knowledge of the artless ways of amateurs, do not miss either the humour or the point of the grotesque photographic doings of poor Mr. Dallmeyer Ross Jones, who, for instance, in his wild attempts to photograph a baby will evoke quite wide sympathy.

Wratten's Ordinary Plates.

Wratten & Wainwright, 38, Great Queen-street, W.C.

An announcement published in the Almanac informs us that as and from January 1 next considerable reductions will be made in the prices of Messrs. Wratten's well-known brand of "London" plates. So excellent are these plates that they are sure of undiminished popularity. Recently we were given an opportunity of using, for transparency purposes, some of the firm's "Ordinary"—a plate that for something like eighteen or nineteen years has been a great favourite with many good photographers. Its rapidity, 14° Warnerke, fits it alike for slow negative work as well as transparency making, for both of which purposes the beauty, richness, and, so to say, body of image it yields are all that the fastidious could desire.

Fitch's Matt Celluloid Films.

E. H. Fitch & Co., Seldon House, Fulwood's-rents, E.C.

Stereoscopic workers who prepare transparencies from their binocular negatives will thank Messrs. Fitch for introducing these films, samples of which have been sent us for trial. The backs of the films have been matted, that is, given a fine ground-glass-like effect, so that when the positives are developed, all that is required is for them to be mounted up, masked, between two plain glasses, and the transparency is complete, the use of ground glass being thus rendered unnecessary. This is a very happy idea. Needless to say that the quality of the emulsion with which the films are coated is excellent.

Mawson & Swan's Photo-Mechanical Plates.

Mawson & Swan, Soho-square.

Quite recently Messrs. Mawson & Swan showed us some negatives of fine line subjects, taken on their photo-mechanical plates, which might fairly be said to rival wet collodion in the purity, detail, and vigour of their qualities. They have also given us the opportunity of using some of the plates, which easily yielded perfectly clear lines and great density with normal exposure and development. Pyro-ammonia is the developer recommended. We should judge that, for the great majority of reproduction subjects, Mawson & Swan's photo-mechanical plates will fulfil all requirements, as their capacity for maintaining clearness and transparency of extremely ne lines is remarkable. Photo-mechanical workers will undoubtedly ppreciate the plates.

News and Notes.

Royal Photographic Society.—Ordinary Meeting, Tuesday, December 10, at 12, Hanover-square, at eight p.m. *The Recording of High Temperatures by Photographic Means*, by Professor W. C. Roberts Austin, C.B., F.R.S. *A New Form of Apparatus for Measuring the Densities of Photographic Plates*, by Chapman Jones, F.I.C., F.C.S.

The Photographic Club.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, December 11. The business of the evening will be Members' Open Night. Mr. James Cole, of Watford, will show and explain his new patent camera. Mr. James A. Sinclair will show negatives made by Goerz, Cooke, and "Wray Platystigmat" lenses. Visitors are always welcomed by the members.

How Longfellow was Photographed.—In an article dealing with the late Mrs. Cameron's photographic work and that of her son, in the December *Windsor Magazine*, the story of how the late Poet Laureate brought Longfellow to be photographed is told. "Tennyson was constantly in the little studio. One morning Mrs. Cameron was seated at breakfast, when there came to her her friend and nurse, with the information that Mr. Tennyson and a strange gentleman were at the door and wanted to speak to her. She hurried out, to find Tennyson and Longfellow awaiting her coming. 'I have brought you a great man, who will let you immortalise him,' growled the poet. 'This is Longfellow; you know him by name, now you know him in the flesh. I will leave you now. Longfellow, you'll have to do whatever she tells you. I'll come back soon and see what is left of you.'"

Printers' Corporation.—We are informed that an effort is being made by the Council of this Corporation to raise a sum of ten thousand pounds with which to permanently endow the Printers' Almshouses. The latest addition to the Almshouses, which are situated at Wood Green, Middlesex, was opened by Her Royal Highness the Duchess of Albany, and Her Majesty the Queen and His Royal Highness the Prince of Wales have become patrons of the Institution. The buildings present a pleasing elevation, being quite an ornament to the locality in which they are situated, and have been constructed to afford every comfort and convenience to the inmates. We have much pleasure in recommending the cause of this excellent Institution, which has now been in active operation for nearly seventy years; and we have been asked to notify that contributions are urgently solicited, and will be publicly acknowledged, and gladly received, by W. Clowes, Esq. (Treasurer), Duke-street, Stamford-street, S.E.; F. J. E. Young, Esq. (Chairman of Council), New-street-square, E.C.; or by J. S. Hodson, F.R.S.L. (Secretary), Gray's Inn Chambers, 20, High Holborn, London, W.C.

A curious little incident occurred the other day, which goes to prove what I have always contended, viz., that, however "wooden" the postal authorities are in their every-day transactions, they seem to save themselves up for special feats which are outside the common ruck. A gentleman connected with this paper spent some days on the East Anglian coast last June, and promised prints from some of his negatives to certain of the fishermen who figured in the pictures. A week ago, when these prints were packed up for transit, he discovered to his annoyance that he had lost both the name and address of the man to whom he had arranged to send the prints for distribution. After a fruitless search for the address, he resolved upon an experiment. Taking one of the prints, he cut out the figure of the individual whose name he had forgotten, and pasted it on the outside of an envelope, added the name of the village, together with the somewhat vague information, "Fisherman near the gap in the cliff!" He enclosed a note stating the facts, and, asking that the name and address might be forwarded, posted the envelope. Two days afterwards, to his pleasant surprise, he had a letter from his fisherman friend, stating that the note had safely reached him, and enclosing his name and address.—*East London Advertiser.*

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 22,647.—"Improvements in Photographic Shutters." W. Fleming.—*Dated November*, 1895.

No. 22,682.—"Improvements in and connected with Photographic Enlarging Apparatus." F. I. Ricarde-Seaver and L. Pernot.—*Dated November*, 1895.

No. 22,683.—"Improvements in Photographic Cameras." F. I. Ricarde-Seaver and L. Pernot.—*Dated November*, 1895.

No. 22,692.—"Improvement in Light-proof Coloured Positive Paper." G. Koppmann.—*Dated November*, 1895.

No. 22,757.—"Improvements in Drying Photographic Negatives and the like." A. Musker.—*Dated November*, 1895.

No. 22,794.—"Improved Appliances adapted for Use in conducting Photographic Dark-room Operations." C. Raleigh.—*Dated November*, 1895.

PATENTS COMPLETED.

Improvements in Apparatus for Developing Photographic Plates.

No. 22,552. Emile Poulenc, 92, Rue Vieille du Temple, Paris. *November* 2, 1895.

My invention relates to apparatus for developing photographic plates.

According to my said invention, I construct a portable developing box, in which photographic plates can be developed at any spot in full light. By my improved apparatus, which is not much bulkier than an ordinary dark slide, I

an develop, and, if necessary, fix immediately after the exposure and in full light and away from any dark room.

This apparatus has the general form of a frame. It is constructed in such a manner that the photographic plate may be easily introduced into the same without risk of being exposed to the light, and when once in the box the photographic plate is perfectly visible from the outside through sides of coloured glass, which enable the progress of development to be followed with the greatest facility, while the photographic plate is kept protected from chemical rays.

The improved box can be easily dismounted, and can therefore be cleaned interiorly in all its parts, which is an essential condition for the success of the operations. At the same time precautions are taken for ensuring complete tightness, although the sides of glass with which the box is provided are removable; this removableness facilitates the cleaning, and permits of the rapid replacement of the glass plates which may break.

By suitably arranged devices, the developing box can be rapidly filled and emptied in succession with different liquids if desired, so that I may not only effect the development and the washing of the photographic plate, but also the fixing of the same without taking it from the developing box.

For the introduction of the photographic plate into the developing box, I make use of a special auxiliary frame, into which is caused to pass, after the exposure, the photographic plate contained in the negative frame; this last operation is effected below any black cover with which the whole is surrounded, without any necessity for passing into a dark room. This auxiliary frame, which constitutes a kind of intermediary gate between the dark slide and the developing box, is arranged so as to fit upon a removable part placed above the developing box and forming an automatic shutter, and when it is once in this position the photographic plate may be caused by a very simple movement to drop rapidly into the developing box.

This special frame can, moreover, be so arranged as to serve as a dark slide, thereby obviating the before-mentioned manipulation.

In carrying my invention into practice, I provide a developing box proper, an auxiliary frame and an intermediate part which serves to adapt the frame upon the said box. This part also serves as an automatic safety shutter for preventing the access of daylight to the plate which has fallen into the box, if before withdrawing the frame I have forgotten to close the shutter with which the developing box is provided.

The developing box is constituted by a rectangular wooden frame, into which are inserted two sides of red glass. The space between these two glass plates constitutes the developing chamber proper. The photographic plate is introduced into the same through a slit, and the reagents through a funnel having a cock. A hole is provided for the outlet of the air during the filling, and a tube having a cock serves for the emptying.

When the photographic plate is in the developing box, its lateral edges engage with grooves, so that it cannot stick agalnst the glass plates, and that it will always be bathed properly by the liquid.

As before stated, I have arranged the developing box so that it can be very easily dismounted, in order to facilitate the cleaning and also the replacement of the broken glass plates.

For this purpose the wooden frame is composed of three parts, which fit together by tongues and grooves, and to receive between them in rebates the aforesaid glass plates. In order to ensure tightness, the glass plates are provided on each face with indiarubber borders, against which the edges of the parts of the frame exert a pressure when I tighten the nuts, which are screwed upon bolts traversing the three thicknesses of the frame, and it is sufficient to remove them for completely dismounting the developing box.

For giving strength and rigidity to the whole arrangement, the outer faces of the outer parts of the frame are covered with the sheet-metal strip upon which presses the nut or the head of the said bolts.

One of the outer parts of the frame may have a groove, into which I may introduce a supplementary plate of red glass, held in its place by a small latch.

If it is desired to remove this glass plate in order to more easily follow the development, it is sufficient to turn the latch, so as to free the slit through which the glass plate has been introduced.

The second of the two outer parts, like the first, may also be provided with a groove for the reception of a second additional plate of red glass.

I provide the developing box with a shutter for obturating the slit through which the photographic plate to be developed is introduced.

This shutter consists of a small plate of ebonite placed in the slit of the second outer part, and adapted to engage with a slit of the middle part. Small indiarubber bands, fixed with their extremities upon the second outer part of the frame, and passing through holes in the shutter plate, constantly tend to pull this plate outwards. Turned buttons hold the shutter plate in its interior position in which it closes the aforesaid slit, but if the turn buttons are turned the shutter plate, under the action of the indiarubber bands, slide to the outside and free the slit.

At its upper part the developing box presents a guide for the reception of the intermediate part, which is caused to slide in one direction in order to put it in its place, and is stopped in this place by a tail piece with which the said part is provided.

A spring catch is arranged at its opposite extremity, is hooked upon the frame of the box, and prevents the intermediate part from leaving as long as it is not raised by hand.

The intermediate piece is pierced with a vertical slit, which forms the prolongation of the aforesaid slit for enabling the photographic plate to fall into the box.

This vertical slit is kept closed by a safety shutter as before stated. The said shutter is constituted by a small sliding plate ordinarily held by springs upon the slit. But the shutter automatically uncovers this slit when the auxiliary frame is put in its place by the intermediate part. For this purpose the frame is provided with a metallic plate placed in a corresponding slit of the intermediate part. During this movement the inclined edge of the plate encounters a pin fixed to the shutter, and by acting upon this pin pushes the obturator sideways, overcoming the action of the before-mentioned springs so that the slit will be automatically opened.

When the frame sliding has arrived in the position which it must occupy upon the intermediate part, it is stopped by its projecting part encountering a shoulder on the cover plate for the slit.

The frame presents a cavity for the reception of the photographic plate, which is introduced into the same through the slit which prolongs this cavity to the outside, and which is directly above the before-mentioned slits when the frame is in its place upon the intermediate part.

The photographic plate is retained in the frame by a shutter plate, which can close the said slit. This shutter plate is carried by one side of the frame, which is mounted by a hinge or articulated at its upper part in such a manner that its lower part can approach or recede from the opposite slide; when it is near the same, the said plate prevents the photographic plate from leaving, the first-mentioned side being retained in this position by the engagement of a small bolt with a stop plate; but, if I raise this bolt above the stop plate, springs will push this side and the shutter to the outside, thereby allowing the introduction of the discharge of the photographic plate.

All the details of construction having been described, I will now set forth the mode of employing the apparatus.

The first operation to take place is to put the photographic plate in the auxiliary frame. For this purpose, the auxiliary frame being separated from the remainder of the apparatus, I raise the aforesaid bolt so as to cause the shutter to move away sideways; then I take the photographic plate from the dark-slide, and introduce it through the said slit into the cavity of the frame. Next I press upon one of the sides in order to push it inwards, and the bolt, which is submitted to the action of a spring, takes behind the stop plate, so that the cavity containing the photographic plate will be closed.

Of course, this operation of charging the frame must take place so as to keep the photographic plate protected from the light, and for this purpose it is sufficient to effect this manipulation in a kind of sleeve of dark fabric, into which I introduce the arms through suitable openings. The manipulation is easily effected by feeling, without the aid of the eyesight.

If it is desired to obviate this transport of the plate which has been exposed into an auxiliary frame, it is sufficient to employ the said frame as a dark slide. For this to be possible, I replace the fixed side by a movable blind.

When the frame has been charged and closed, it is taken from the sleeve and slid into its place upon the before-mentioned intermediate part, thereby causing the opening of the shutter; then I open the shutter by turning the button. Next, I raise the bolt in order to free the slit, whereupon the photographic plate falls into the chamber; then the shutter is closed again, being pushed by hand inwards, while the said button is brought to a suitable position.

It will be readily understood what remains to be done in order to develop the plate, and to wash it and even to fix it if desired. The sides of non-actinic coloured glass enable the progress of the operations to be followed without danger of fogging.

When the apparatus is to be cleaned, I remove the intermediate sliding part and unscrew the nuts for the complete dismounting.

The apparatus may be constructed for photographic plates of large size, and yet serve for plates of small size if necessary. It is sufficient for this to introduce into the developing box and into the frame so-called intermediaries, as in the similar instances for ordinary frames.

To this end I remove one of the outer parts of the frame from the box, and bring the right-hand lateral edge of the intermediary, which is thinned to form a tongue, into a lateral groove in the middle part, putting a spring under tension. When the latter subsequently expands, it causes the left-hand edge of the intermediary, which is likewise thin to form a tongue, to pass into the left-hand groove of the middle part, the intermediary being thus firmly secured in the two grooves by the pressure of the said springs.

It is then only necessary to put the outer part back in its place and to tighten the bolts.

Of course the upper side of the intermediary presents a mortice, which enables the plate to fall into the box, its edges engaging with two lateral grooves, which retain it and prevent it from being applied against the glass plates.

Holes are provided in the intermediary opposite the before-mentioned conduits in the box for permitting the access of the liquid to the plate, the outlet of the air, and the emptying of the box.

Another intermediary may be placed in the frame in the same manner as the first intermediary is placed in the box.

The lower side of this intermediary is pierced with a slit to allow the passage of a plate, which is retained in a suitable position for being exposed while bearing upon the extremity of a plate spring fixed to the movable side. When the latter moves away to the outside, owing to the raising of the bolt, the extremity of the plate spring passes from below the said plate, at the same time that a strip uncovers the passage, so that the plate which has been exposed can fall into the intermediary of the box.

Although the above-described apparatus is preferably employed, I do not limit myself strictly to the details set forth. Thus I may construct the developing box not only of wood, but of any other appropriate material. I may, moreover, dispense with the intermediate part, and fasten the frame directly to the box, which may then be provided with one or both of the shutters hereinbefore described. I may also modify the mode of tightening the frames upon the glass plates, and make other modifications of the same kind [illegible].

It is, moreover, evident that my apparatus may be employed irrespective of the process of development, and whether negatives or positives are to be developed upon glass or any other material.

An Improved Method of Producing Negatives for Photographic "Process" Engraving.

No. 23,052. Augustus William Key Bryan, Leicester House, Spotland-road, Rochdale.—*November* 2, 1895.

The improvements relate to screens employed in photographic "process" engraving, and have for object to screen sensitised plates prior to their use in the camera, and thereby to obtain greater facility in the production of screened negatives.

To accomplish this, and to effect my improvements, I provide a special negative of glass or film, which I cause to be reticulated by transparent lines on an opaque ground to form a screen.

These reticulations may be formed upon the special negative by hand, or they may be developed thereon by photography from lace, muslin, or other reticulated objects or surfaces, or by other means, as may be found most suitable.

This special screen is then placed in any convenient manner upon or close to an unexposed sensitive plate, which plate is required ultimately to form the screened negative desired, and the screen thus covering the plate is afterwards exposed to the light, by which means (light being enabled to penetrate to the sensitive film of the photographic negative through the transparent lines only) a partial exposure of the sensitised plate, acting in the form of the recticulated lines, is effected.

The sensitised plate is then employed in the camera in the ordinary manner, the result being that a photograph is taken upon a reticulated or screened plate in lieu of the plate which is sensitive over its entire surface.

By this means a screened negative is produced without the employment of gauze or other like screens in the camera, and greater facility in operation is thereby obtained.

Variations in detail, such as the manner of reticulating the negative screen, together with the form of the reticulations, may be made without departing from the peculiar character of the invention.

The claim is: In the production of negatives for photographic "process" engraving, a special reticulated negative for the purpose of producing reticulations by exposure upon the surface of the photographic sensitised plate in manner substantially as herein set forth.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
9, 10	Birkenhead Photo. Asso.	Photographic Exhibition.
9.....	Camera Club	*Enlarging by Artificial Light.* Dr. C. S. Patterson.
9.....	Lantern Society	
9.....	Norfolk and Norwich.....	
9.....	North Middlesex	
9.....	Oxford Camera Club	*The Moselle.* J. B. Wilson.
9.....	Richmond	*The Making and Use of Collodio-bromide Emulsion.* G. Ardaseer.
10.....	Birmingham Photo. Society ..	
10.....	Brixton and Clapham	*Gelatino and Collodio-chloride Papers.* A. Whittaker.
10.....	Hackney	
10.....	Manchester Amateur	
10.....	Newcastle-on-Tyne & N. Counties	*Light.* J. S. B. Bell.
10.....	Paisley	
10.....	Royal Photographic Society ..	*The Recording of High Temperatures by Photographic Means.* Professor W. C. Roberts-Austen, C.B., F.R.S.—*A New Form of Apparatus for Measuring the Densities of Photographic Plates.* Chapman Jones.
10.....	Stockton	
11.....	Croydon Camera Club	Lantern Night: Members' Slides.
11.....	Ipswich	
11.....	Leytonstone	
11.....	Munster	
11.....	Photographic Club	Members' Open Night.
11.....	Southport	
11.....	Stockport	
12.....	Bradford.....	*Photography in Relation to Art.* Alex. Keighley.
12.....	Camera Club.....	
12.....	Cheltenham	
12.....	Glossop Dale	
12.....	Hull	
12.....	Leicester and Leicestershire ..	
12.....	Liverpool Amateur.....	Annual Meeting. Exhibition of Competition Slides and Prints.
12.....	London and Provincial	
12.....	Manchester Photo. Society	
12.....	Oldham	
12.....	West London.....	
12.....	Woolwich Photo. Society	*The Delineation of Microscopic Objects by Photography.* Charles H. Oakden.
13.....	Bournemouth	Lantern Exhibition of Slides, *Animals you Know.* H. M. Roberts.
13.....	Bristol and West of England ...	
13.....	Cardiff.....	
13.....	Croydon Microscopical	*A Comparison of the Spectroscopic and Photographic Examination of Artificial Dark-room Illumination.* A. Roods, F.S.I., and J. H. Baldock, F.C.S.
13.....	Halifax Camera Club.....	
13.....	Holborn	
13.....	Ireland	*Normandy.* Messrs. Keogh & Goodwillie.
13.....	Maidstone	
13.....	Plymouth	First Exhibition of Members' Work.
14.....	Hull.....	

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

NOVEMBER, 28,—Mr. Hodd in the chair.

The HON. SECRETARY said Messrs. Wray had placed one of their new lenses at his disposal, and he had made a few trials. It was a five-inch quarter-plate lens, made of the new Jena glass, and composed of doublets of triple cemented lenses. He showed negatives taken with *f*-8, *f*-16, and with the smallest stop, all being pretty free from astigmatism; also one, exposed to gaslight, of a newspaper sheet, reduced to about one-eighth of the original size. He was very well satisfied with the lens, and mentioned that the whole of the negatives were on plates about seven years old. Referring to the decision of a former meeting to obtain a portrait of the late Mr. Traill Taylor, he had heard that Mr. Hay Taylor would be pleased to send an enlargement for the Society.

Mr. T. E. FRESHWATER announced that he had been at work for a considerable time on the production of stereoscopic pictures on the screen, and at an early date hoped to show the Association the results of his work. With regard to his process, he had nothing to say at present.

Lantern slides by Messrs. Ashby, Freshwater, Kellow, and Teape (Shrewsbury Convention) were shown on the screen.

The HON. SECRETARY announced that, owing to difficulties in respect of the hire of their meeting room, it was desirable to get other quarters, and a small sub-committee was formed for that purpose.

PHOTOGRAPHIC CLUB.

THE usual weekly meeting was held at Anderton's Hotel, Fleet-street, E.C., on Wednesday evening, November 27, Mr. Troup in the chair.

Mr. W. Scarborough was duly proposed and seconded as a member of the Club.

Mr. HAES, one of the trustees, brought up the question of "Ladies' Night," upon which he desired to take the opinion of the meeting, but the matter was felt to be one with which the Committee could deal satisfactorily, and it was decided to leave it in their hands.

The business of the evening was a collection of slides of the last Convention, and about seventy members and friends attended, and amongst them many prominent conventioners, notably Mr. H. P. Robinson, who was warmly welcomed.

Mrs. Catherine Weed Ward's set of slides were first shown, and comprised excellent pictorial representations of the Old Mint at Shrewsbury, the house where Darwin was born, and of Ludlow Castle and many others. Mrs. Ward's work was particularly even and good.

Mr. F. W. Hindley showed an interesting series—all made upon celluloid films in the Facile hand camera. Snap-shots of Professor Haddon, Mr. Liesegang, Mr. Montefiore, Mr. Sturmey, Mr. Mason, the "Convention swell," and the "late" member in his shirt sleeves, were all appreciated, and were a very interesting set.

Mr. Hepworth showed a set few in numbers, but of well-chosen subjects, and Mr. J. B. B. Wellington showed slides made upon his new stripping films, which he hopes to place before the public commercially early in the new year. Mr. Wellington has forsaken his old love—collodio-bromide—for slide work, and now uses his stripping films specially prepared for the purpose.

Mr. Lawson, a visitor from Shrewsbury, Mr. Greatorex and Mr. Naunton, both of that town, and Mr. W. Edgar, of Nottingham, had excellent work upon the screen, and Mr. Seaman, of Chesterfield, was likewise represented by some very excellent slides made from negatives of the "lunch" at Ludlow.

Mr. Teape's set, all made on "backed" whole-plates, were of his usual good character.

Mr. Welford showed a good set, and Mr. Greatorex a set on collodio-bromide emulsion, some of them being from negatives, by Mr. M. J. Harding, of Eaton Hall.

The aggregate of slides was 220, and it was suggested by Mr. Robinson that the slides might be kept together as a Convention set. He also drew attention to details of the next Convention, which is to be held at Leeds. The district will be excellent for excursions and picnics, and the Leeds people are already in the thick of their arrangements.

Mr. Bridge and Mr. E. J. Wall manipulated the lantern.

Brixton and Clapham Camera Club.—At the meeting held on Tuesday, November 19, Mr. W. T. WILKINSON gave a working demonstration of the collotype process. The plates consist of glass, about three-eighths of an inch in thickness, and are prepared by rubbing two together, between which moist flour emery is placed. An even grain is quickly obtained. After washing, the plates are coated with a suitable substratum, and afterwards sensitised with gelatine containing potassium bichromate. After drying in the oven, the plates are ready for printing upon. Reversed negatives, provided with a safe edge (usually of tinfoil), are necessary. The progress of printing can be seen by an examination of the back of the plate, and may take a day in the shade. When printed the plate is well washed, dried, and then covered with the so-called "etching solution," the object of which is to swell the gelatine in proportion as the light has not made it insoluble, *i.e.*, those portions representing the whites absorb the most glycerine, and so on in proportion to the deep shadows. After the solution has acted sufficiently (care being taken to keep the plate in a horizontal position) the excess is removed with a cloth, and the plate fixed in the printing press, a mask of waxed paper being used to cover the margins of the plate. Two rollers are used for inking, the first a leather one, the second of a gluelike composition. The ink is a good quality lithographic ink, thinned to working consistency with lithographic varnish, and adheres only to the parts of the plate affected by light, the glycerine moisture preventing adhering to the whites. A piece of paper is now placed upon the inked plate, pressure applied, and a copy thus obtained. Either a rough or a smooth-surfaced paper can be used, and the ink may also be of any desired colour. In reply to questions, Mr. Wilkinson sad that about 1000 copies were usually obtained from each plate. The process did not necessarily require an expensive outfit; an amateur could obtain what was requisite for three or four pounds. A proper collotype press cost 10*l.* or upwards, but was not indispensable, a very efficient substitute being obtained in one of the machines with rubber rollers supplied for domestic purposes at a cost of fourteen or fifteen shillings, and a drying oven can easily be made at small expense by the exercise of a little ingenuity. Mr. Wilkinson's demonstration was closely

followed by an attendance of nearly fifty members, and a unanimous vote of thanks awarded him at its termination.

NOVEMBER 26, Mr. J. W. Coade (President) in the chair.—Mr. W. THOMAS addressed the members on *Some Lessons from the two Photographic Exhibitions*, describing the noticeable features of various exhibits recently shown at Pall Mall and the Salon, illustrating his remarks either by reproductions or by rough charcoal drawings to show the pictorial arrangement. Dealing first with the Salon, Mr. Thomas said one experienced a feeling of gloom on first entering the Gallery, due probably to the sombre decorations of the room and quiet style of framing generally adopted. This feeling, however, soon passed away, and many delightful hours could be spent in examining the beautiful work there shown. It was remarkable that many of the pictures which attracted notice at first were not those which seemed to improve with further acquaintance, while pictures which had perhaps been entirely passed over at a first visit seemed to grow upon one's fancy the more you saw of them. This, he thought, was a good test for a picture. Both at Pall Mall and the Salon there was this year an element of moderation. The majority of the pictures were neither objectionably sharp nor ridiculously fuzzy, and the framing, in many instances, had been conducted with excellent judgment. He severely deprecated the mere imitation of paintings by photographic means. A photograph should stand or fall on its merits as a photograph, not as an imitation of something else, or a mixture of photography and paint, which gave results false alike to art and photography, equally objectionable being the spirit which leads to mere copying of successful work. If a picture receives unusual attention on account of its originality or fine treatment, very soon imitations are exhibited. Perhaps the printing method or the frame is peculiarly adapted to this particular picture, and we have immediately a run on this process of printing or class of frame for subjects totally unsuited to the same treatment; or it may be a landscape, containing some landmark easily recognised, dependent for its success not upon any noticeable feature in the view itself, but upon its well-managed light and shade. We have at once numbers of views taken from the same position, in many cases with very commonplace results, the one being an expression of the individuality of the artist, the others mechanical productions without interest or merit; whereas, had a study of the few simple principles governing all pictorial work been made, we should realise it was not the subject, but the treatment of it, that had made the success, and by applying the same principles equally brautiful results were to be obtained from any of the material lying around us everywhere in unlimited profusion. Let us be original, above all things; study the broad principles which underlie all successful art composition—light and shade, &c. When these are understood, it will be unnecessary to roam over Europe in search of subjects, exposing plates on everything on the chance of one or two turning out a success, we shall then realise that pictures may be made equally well near home, pictures of every-day subjects from commonplace material, pictures the result of careful intelligent design, a lasting pleasure to ourselves and others.

Croydon Camera Club.—The meeting on Wednesday, the 27th ult., was devoted to the improvement of negatives after development, Mr. JENKINS explaining and showing a number of ways in which a negative may with advantage be treated. His main reliance was placed in the uranium intensifier applied locally, and in some cases in part removed with a weak solution of ammonia and water. In the discussion, Mr. HECTOR MACLEAN (the President) considered more consideration should have been accorded to the use of reduction, combined with intensification, and explained, by means of diagrams, how such treatment is advantageous. He also referred the meeting to a series of intensifiers which he had drawn up, founded in part upon Mr. Chapman Jones's experiments. In this the amount of resulting intensification was arranged in regular order, so that the photographer could readily choose an intensifier which would give the precise addition of vigour which his negative lacked. Mr. PUSEY considered that the uranium intensifier was undesirable, as very greatly prolonging the printing. Messrs. J. Smith, J. Allbright, Jackson, Watson, Holland, and others also took part in the discussion, the meeting according Mr. Jenkins a cordial vote of thanks for his demonstration. A striking enlargement of a flashlight group, which was made during the previous week at the Club rooms with the newly acquired enlarging lantern, was placed in charge of Mr. Jenkins for mounting. Messrs. Percy D. Penn and J. Noaks exhibited prints, the latter showing an instructive series of views from the same quarter-plate negative, varying in size from 12×10 inches to $1\frac{1}{2}\times1$ inch. Mr. Smith also showed an interesting flashlight "parlour group," illustrating the efficiency of the system for home portraiture, &c. Mr. Edward Costa was elected a member.

Hackney Photographic Society.—November 26, Mr. William Rawlings presiding.—It was agreed, on the proposition of Mr. W. Fenton.Jones, seconded by Mr. R. Beckett, to send a letter of sympathy to the friends of the late Mr. Traill Taylor, who was an honorary member of this Society. Mr. HILLSWORTH inquired what was the object of adding sulphuric acid to the ferrous-oxalate developer for bromide paper. In reply, Mr. R. BECKETT said that the addition of the acid prevented the formation of the ferric salt, which, unlike the ferrous salt, was a destroyer, and not a developer, of the image. He mentioned that old used developer could be greatly restored by placing in the sun. A book of specimens of Messrs. Butcher's cloud negatives was handed round for inspection. Mr. J. O. GRANT protested against the use of bought cloud negatives for competitive work, and urged that it was unfair. Mr. HENSLER showed a print from a quinol-developed negative, which was insufficiently dense to allow the faint details to show in the print. He inquired whether the negative could be stained in some way to help the weak details. Mr. R. BECKETT advised staining the negatives in a solution of pyro and ammonia. Mr. GRANT said that, if the character of the negatives was to be altered, a transparency should be made, and then from this another negative developed to the right point. The rest of the evening was devoted to a discussion concerning the recent Exhibition.

North Middlesex Photographic Society.—November 25.—Mr. Mummery (the President) in his opening remarks, called attention to the Annual Exhibition to be held on December 2, 3, and 4. A series of Scotch slides, kindly lent for the occasion by the South London Photographic Society, were then shown, and were much appreciated by the audience. A few slides by the members were afterwards put through the lantern.

Richmond Camera Club.—At the meeting on November 25, Mr. Purcell in the chair, Mr. RAMSAY, of the Eastman Photographic Materials Company, lectured on *The Uses of the Eastman Platino-bromide Paper*, explaining fully the advantages of the paper and the mode of using it for contact printing and enlarging, and demonstrating its manipulation by developing a few prints with ferrous oxalate, which he considered gave better results than any of the newer developers. A number of specimen prints were afterwards passed round and greatly admired.

Bradford Photographic Society.—November 28, Mr. W. C. Ramshaw in the chair.—Mr. C. C. VEVERS, the author of that well-known handbook on *Photographic Optics*, gave an interesting and demonstrative lecture on *Elementary Photographic Optics*. The question of lenses and the study of optics is one to which the average amateur gives but little attention, hence the many so-called difficulties that continually crop up. Optical literature is generally so dry as to be unpalatable to the reader, so that if he does not have the whole thing put to him in a feeding bottle, as it were, he is unable to digest it. Amateurs of Bradford, on this particular night, had the good fortune to have the question of lenses served up in a very tasty manner. Mr. Vevers dealt with his subject in a very workmanlike way. He thoroughly explained the theory of light, the passing of it through various media, the action of lenses, spherical and chromatic aberration, achromatism, and many other technical points. The various forms of lenses, from a pinhole to a "baby" portrait, were explained, their definition, angles, &c. Mr. Vevers has the whole thing at his finger-ends, and the way in which he serves it out gives him great credit. By aid of specially made apparatus and diagrams many "tough" problems were solved. Mr. Vevers alluded in pathetic terms to the late Mr. J. Traill Taylor, who, he said, with his ever-ready goodness, had helped him out of many of his initial difficulties with optics. A splendid case of lenses, in all stages of manufacture, was kindly lent for the occasion by Messrs. Ross & Co., of London. At the close a vote of thanks, proposed by Mr. W. Booth and seconded by Mr. P. R. Salmon, was carried unanimously. A goodly number of the Leeds Society were present.

Liverpool Amateur Photographic Association.—November 28, the President (Mr. G. B. Newton) in the chair.—Mr. F. ANYON gave a lecture on *The English Lake District*, illustrated by a number of lantern slides, principally the work of the lecturer. The lecture was greatly enjoyed by a crowded audience, and a hearty vote of thanks was given to Mr. Anyon. Mr. Wormold then exhibited a number of photographic novelties, and demonstrated the use of the incandescent gaslight as an illuminant for the optical lantern.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—Special Meeting, November 26, Mr. J. P. Gibson (President) in the chair.—Before a very large muster of members, Mr. LUBOSHEZ demonstrated the use of the Eastman Company's platino-bromide paper, followed up by a talk on *Art in Portraiture*. Both lecture and demonstration were highly enjoyed, as also were the specimens shown by the lecturer in illustration of his remarks.

Oxford Camera Club.—The meeting on November 25 was devoted to a lecture on *The Modern Hand Camera and its Capabilities*, by Mr. F. O. BYNOE, of Messrs. R. & J. Beck, Limited. He showed the characteristics of the successful hand-camera worker to be similar to those of the good sportsman, including readiness of conception and promptness of execution. Valuable hints were given as to the best position for holding the camera steady, a "stand-at-ease" position being recommended, the trigger to be released by a *squeeze* (not push) by a free finger, the thumb not to be used; the exposure preferably to be made after one has "expired" (not finally, but momentarily). There were many good hand cameras on the market, some taking plates and some films. Films, though now as reliable as plates, were not so till recently, a great impetus having been given by the introduction of the Frena, for which in its first year three-quarters of a million films were issued. Various devices for changing films were mentioned, some answering perfectly till introduced to the public. The whole difficulty was due to the thinness of the films, only $\frac{1}{100}$ of an inch. The Frena film-changing mechanism was then shown and illustrated by ingenious mechanical slides, as also the principle of the fixed-focus lens and the use of supplementary magnifiers for focussing near objects. The advantages of a swing back over a rising front were pointed out, the latter requiring a lens of much greater covering power. A number of slides from Frena negatives followed, which were much admired. A hearty vote of thanks was given to the lecturer for his interesting and successful lecture.

Rotherham Photographic Society.—A special meeting was held on Tuesday, November 19, to witness a demonstration on *Development of Negatives and the Use of the Brush*, by Mr. T. G. Hibbert, of the Sheffield Photographic Society. There was a good muster of members. Mr. E. Isle Hubbard, M.S.A., Vice-President, occupied the chair. Mr. Hibbert developed two negatives, an interior, and a portrait, the contrast in each being considerable. By the skilful use of a ten per cent. solution of bromide of potassium or of accelerator, applied by means of camel's-hair brush, he was enabled to produce very harmonious results. The developer was pyro-soda, and a weak solution was recommended at the beginning, additions being made as necessary. Prints from negatives which had received similar careful treatment were handed round. On the proposition of Mr. J. Gibbs, seconded by Mr. G. T. M. Rackstraw, Mr. Hibbert was cordially thanked. The lantern was afterwards brought into operation, and a number of slides, including a good contribution by Mr. Hibbert, were exhibited.

Brechin Photographic Association.—The monthly meeting of this Association was held in the rooms, Park-road, on the evening of Wednesday last, the 27th ult., Mr. J. B. Terrace in the chair.—A lantern lecture, entitled *Up Glenesk in a Four-in-Hand*, illustrated by upwards of seventy slides, was given by Mr. MACKIE. Not a few of the slides, which were all made by the lecturer from his own negatives, were exceptionally good. Mention may be

made of the following as being specially admired :—*Black-faced Mutton*, *The Birks of Ardoch*, *The Village Smithy*, *Tarfside Chapel* (interior), *A Tiny Cascade*, *Sunset on Loch Lee*, *A Glen Cottage* (interior), *The Queen's Well*, and *Falls of Unich*. On the motion of the Chairman, a hearty vote of thanks was accorded to Mr. Mackie for the excellent exhibition he had given.

Kilmarnock and Ayrshire Photographic Society.—The usual monthly meeting of this Society was held in the hall of the Young Men's Christian Association, High-street, Ayr, on Saturday last, Mr. J. Mack Wilson, Seabank, Prestwick, presided.—Mr. NAHUM LUBOSHEZ, the representative of the Eastman Company, gave a demonstration of platino-bromide paper and a lecture on *Portraiture*. Mr. Luboshez, who is a Russian by birth, spoke the English language fluently, and greatly delighted the audience by the excellent way he dealt with his subject. We must congratulate the Eastman Company on having retained the services of such an excellent artist. The following were admitted members: Dr. McGregor, Miller-road, Ayr; Alexander F. Reid, Bonshaw, Stewarton; and Messrs. Havill Garvie, T. H. Milloy, and George Pitcher, Kilmarnock. The Council appointed Mr. Robert Johnstone, 38, St. Andrew's-street, Kilmarnock, Treasurer of the Society, the Secretary having discharged the duties *ad interim*.

FORTHCOMING EXHIBITIONS.

1895.		
December 18–20	Blairgowrie and District Photographic Association	J. C. Gorrie, Hon. Secretary.
,, 20, 21.....	*Nottingham Camera Club.	W. Edgar, 123, Clinton-terrace, The Park, Nottingham.
1896.		
March	*Cheltenham Amateur Photographic Society.	Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

FREE TRADE.

To the EDITORS.

GENTLEMEN,—Under the Excise laws, I pay a licence for the sale of adulterated methylated spirit specially "prepared for retailing" under official regulations, which also restrain me from selling more than a gallon at a time. It is deliberately rendered useless as a cheap spirit, for many of its most important scientific and trade purposes, by becoming milky upon the addition of water, because a few foolish people make a bad use of it, and do so still.

Under the Weights and Measures Acts I have been fined for pioneering the metric system in compounding preparations from modern science books.

Under the Explosives Act I have been fined for having in stock coloured fires, which are only *combustible* like coal, wood, or paper, and which would be useless if explosive.

Under the Pharmacy Act I have been deprived of the proper use of my mother-tongue in the use of the title "chemist," which word has been legally monopolised by the druggists as their "trade mark," without any reference whatever to their *chemical* qualifications.

Under the same ridiculous Act I am now restrained from following an important part of my calling, though I possess a "competent knowledge" of *my* business, and have been engaged in an absolutely safe retail trade in poisonous chemicals for thirty years.

Notwithstanding that red tape, bureaucratic routine, bad chemistry, and keen trade union interests are responsible for these repressive and oppressive measures, I still believe that we in this country enjoy the greatest freedom, and that in time such measures as these shall be amended through force of public opinion when their inconvenience to the community is sufficiently known and felt.

You mention that "proceedings against photographic dealers have been far more rife since the 'duly qualified' have taken to vending cheap photographic apparatus."

Of course, we all know it is the trade they covet, and not the "interests of the public," which they would fain have us believe they are called upon to protect.

In this connexion it has been suggested to me that a grave public danger arises through druggists taking up the sale of photographic and other poisonous "chemicals," not drugs, the properties of which, in the majority of cases, they do not understand. The consequences of filling up and labelling "To be shaken before taken" an insufficiently washed intensifier bottle, for instance, might be very serious.

In fact, poisonous "chemicals" are quite out of place in a drug'shop. A solution of potassium cyanide sent out in a round bottle duly labelled "William Hume, Scientific Instrument-maker and Technical Chemist, Edinburgh, has never all these years been mistaken for medicine, or caused death "by misadventure," but the same solution sent out in a *flat* bottle labelled "D. Gregory, Family Dispensing Chemist, Seltzerville," might readily read "Family Disaster," and *is* at the present moment a public danger.

Of course, I frankly admit that murderers and suicides could formerly have obtained poison here, as they can now from one "duly qualified," by making, like the Pharmaceutical Society's emissary to me, a false declaration, the only one I ever knew of here.

Have your readers noticed that there is in the pharmaceutical journals a standing column for inquests upon fatal poison cases? On October 5 there are twenty such cases reported in one week.

The enclosed is one of many letters of "indignant sympathy" I have received; but I have abundant ammunition ready for action, which I may publish later, should any organised movement be contemplated.—I am, yours, &c., [WM. HUME.

Edinburgh, *November* 29, 1895.

THE COUNTY COUNCIL AND PHOTOGRAPHING THE LONDON BRIDGES.

To the EDITORS.

GENTLEMEN,—I see by your last issue that nobody took the trouble to confirm your opinions in regard to the action of the Bridges Committee of the County Council. This indifference serves to illustrate my remarks as to the apathy of photographers to their trade interests. All photographers must admit that the policy of the Council, in placing its photographic work in the hands of a person vaguely described as "the chemist," is decidedly to its disadvantage.

The Council ought quickly to be rid of that very prevalent idea, that anybody with a camera and lens and a few chemicals is competent to produce work equal in quality to that of the most experienced photographer. A 24 × 18 direct negative needs in its manipulation a skill not readily acquired; and what qualifications can a man possess who is not specially trained to handle plates of so large a size?

The work required by the Council is the most difficult in photography, and could only be efficiently carried out by firms who make a speciality of such work.

It would be interesting to learn how "the chemist" can take 100 direct 24 × 18 pictures for 102*l*., whilst the lowest estimate from professional men is 121*l*. 3*s*. 6*d*.

Will the London County Council, when it builds the new municipal hall, give the painting of the portraits of its past celebrities into the hands of the famous painters of Hammersmith Bridge? Yet their present action is not less ridiculous.

I certainly think that, if it is not too late, a memorial should be presented to the Council, pointing out the folly of giving their photographic work to other than professional men. The difficulty is to find a body of men representative enough to speak for photographers.—I am, yours, &c.,

JOHN A. RANDALL

118, *Cregoe-street*, *Birmingham*, *November* 30, 1895.

COPPER PLATES FOR PROCESS WORK.

To the EDITORS.

GENTLEMEN,—As I am not an electro-typer, I cannot say whether Mr. Miall's suggestion, in current number, of coating a copper plate of low grade with purer copper would answer, but think that the surface would be too rough for practical purposes. I can tell him, however, that an electro reproduction of a smooth surface, backed with type metal in the usual way, forms an excellent substitute for copper plates when etching with ferric chloride. The reason I do not use it myself is that I cannot get it so cheaply as copper. I enclose a first proof from a block so made.—I am, yours, &c. J. A. C. BRANFILL.

25, *Rosendale-road*, *West Dulwich*, *S.E.*, *December* 2, 1895.

POWERFUL LIMELIGHT JETS.

To the EDITORS.

GENTLEMEN,—I quite agree with Mr. Thompson that, if reports of Society meetings are of any value, they should be accurate and not misleading. Take, for example, the report of the meeting held at Anderton's Hotel by the Photographic Club, on November 20th, as it appeared in your JOURNAL of the 29th inst., *re* "limelight jet contest." I don't know who wrote it, nor do I care much; but I do like facts. Why was my name bracketed with Newton & Co.? They had nothing whatever to do with the jet testing; they were neither asked nor did they send any one to represent them. Again, I am reported to have asked the silly question, "Might fresh limes be used?" What I said was, "Were the same limes to be used on the jets?" Probably the reporter did not know that there was any difference in the illuminating quality of different limes; if so, I would suggest that he bought a few of the various makes and try them, he would most likely learn something. Another thing, Why were the two principal gentlemen's names left out in the

pointed referee? Again, Why were the various readings left out? Mr. Scarborough, with a great flourish of trumpets, is declared the victor; nothing is said about "jet," I think No. 8. Four readings were taken; two were higher, one a tie, and the fourth the gas gave out before the reading could be finished—at no time during the testing of this jet could enough gas be got to supply the enormous consumption.

I should much like to add a few of the various comments I heard that night, but perhaps I had better not.—I am, yours, &c.,

45, *Torriano-avenue, Camden-road, N.W.* T. E. FRESHWATER.

To the EDITORS.

GENTLEMEN,—The report sent you of the "competition" at the Photographic Club is erroneous, and also gives a character to the proceedings which is scarcely just to many of the jets represented.

The chief error affects myself. I had certainly no idea of challenge or "competition;" but, for the sake of photometrically testing a new idea, joined in the affair with a rough experimental jet of my own. Four readings were taken between this jet and Mr. Scarborough's, with the result that once his beat mine, once mine beat his, and twice they were a dead heat. Figures are needless, since Mr. Hearson's are to be published; but it should be added that on the occasion mine was beaten the gas was failing rapidly, and actually fizzled out of the cylinder the very moment the reading was announced. The other jet would suffer also, but obviously such a reading is worthless. For either to be "declared victor" (which was not the case while I remained) upon such readings is unaccountable. As some bystander remarked that "such an immense nozzle" as mine *ought* to give a good light, I may say that the nozzle was gauged as nearly as possible to another jet of Mr. Ottway's, which was beaten. Mr. Hearson's figures will show that I used no more than the other.

Next, as to "competition," and how I come to have anything to say to it. The immediate origin of it was a challenge between Mr. Pringle and another gentleman, whom I will only call Mr. A., since his name was ignored. Mr. A., then, desired me to act *as his referee* in the challenge, Mr. Hearson to be Mr. Pringle's. With some reluctance, I consented, and should not have been present, except in the belief that this arrangement was to be carried out. However, at the meeting both Mr. A. and myself were quietly ignored, probably for the reason that Mr. A.'s jet, Mr. Scarborough's and Mr. Pringle's best one were found to be all Mr. Ottway's. Hence it was (as I presume) that the affair became simply a rapid test, under very loose conditions, of such jets as were offered. Before such is exploited for any particular optician, others ought to be specially invited to do their best, under much more definite conditions, including *identical limes* for all, and gauging of the bores, which I had myself stipulated for between the original competitors, but which were taken no account of. Most of the jets beaten were such as their makers supply for average use; and all good makers are fully capable, if required, of supplying jets which can give far more light on occasions where light is of every importance and gas is none. Twelve jets were "tested" in an hour and a half, and of two which were fellows one conclusively beat the other.

How I came to try a jet was simply thus:—When Mr. A. called on me about the affair, I told him I had got Messrs. Newton and Co. to make for me lately a rough experimental jet (it has no lime adjustment or check action) to test an altogether new idea, which I had not yet been able to try in any way, and asked permission, *after the challenge should be determined*, to avail myself of the apparatus to see if I was on the right track or not. He was perfectly willing, and as his nozzle proved much larger than the one made for me, courteously allowed me to take its gauge, to which Messrs. Newton hurriedly made another nozzle upon my new plan. To a preliminary meeting at Mr. Hearson's, for inspection and approval of his admirable apparatus, I took this jet, and it was tried for a few minutes, behaving so well that Mr. Hearson and Mr. Pringle were desirous of seeing it tried. It is the first and only one yet made, though I hope not the last; and that few minutes at Mr. Hearson's, and the trial at the club, are *the only occasions on which I have ever yet tried it at all.* It would be madness to have entered into avowed "competition" under such unknown circumstances, but I did want to find out something definite about it.

Some who know my interest in this problem, may like to be told that my jet consists essentially of a new form of nipple, designed purely from theory, according to an idea which struck me when considering the physics of gases in connexion with another matter. It is designed with the simple and express purpose of seeing *how much gas it is possible to burn* from a given aperture without noise. That is the whole and only secret of more light, with same limes; so long as you can burn more gas *perfectly and silently*, the more light there will be; and there are cases where gas is no object. The workman did not follow my design precisely, but pretty nearly so for practical purposes. My only trials yet are as above, and I was deeply disappointed not to be able to find out its real power, for the simple reason that, while its whole idea is to *burn gas*, it was not possible, from the one cylinder and regulator supplied, to get *nearly enough oxygen* for the coal gas available, with the tap full on. Mr. Scarborough may have been short also. I could only get enough to burn ten feet of coal gas per hour, whereas I had cherished hopes of burning fifteen. I must therefore make further experiments, but am, for one, fully convinced that there is little to be gained from public "trials" in comparison with working out results patiently with the best competitor one can find.

I trust this will not be misunderstood. Mr Ottway has a good right to be proud of his jet, and Mr. Scarborough of his skill. The latter is an old friend of mine, and knows what I think of that skill; but he is the very last man not to desire that any previously untested new "idea" of his friend should have justice, and his last word to me was that we two must have another trial by ourselves "to see which was the best."

Apart from all these matters, two interesting facts emerged. Both my experimental jet and Mr. Scarborough's used, I believe, one tap *full on*, without any noise. This is not usual, and seems to show that both are near the highest possible maximum of efficiency. They stood all the gas we could get with bores approximately $\frac{1}{10}$ inch, without hissing.

The other point is, that both were almost certainly above 1000 candles—how much is doubtful. A certain "saturator" used, certainly had a very small bore; still, neither maker nor operator would be content to put it less than 250 candles, and 300, I think, would be nearer the mark. But it was beaten *four to one;* and other comparative readings, through jets known to be fairly good, lead to the same conclusion. Such facts are of general interest to lanternists.

I will only repeat, in conclusion, that I should neither have written this letter, nor been present, or had anything to do with the matter, had I received notice that the arrangement was altered by which I was one of the referees. I did not know this till the chairman had finished his introductory remarks.—I am, yours, &c., LEWIS WRIGHT.

REPORTING AT PHOTOGRAPHIC SOCIETIES.

To the EDITORS.

GENTLEMEN,—I should like, as a member of the Manchester Photographic Society, and who was present at the meeting when Mr. Brothers showed the McKellen latest hand camera, to say that the report did ample justice to what was done and said about the camera by Mr. Brothers.

Messrs. Thompson & Co. are correct in stating they sent a complete camera and also one to show the mechanism and these Mr. Brothers took in hand and only briefly explained them, and then handed them round to the members present, the whole description not lasting more than five or eight minutes.

Messrs. Thompson & Co. also state, that they know Mr. Brothers is especially qualified to describe such an instrument. Well, perhaps it is good THEY do know this, for Mr. Brothers did not show any of these special qualifications in his description, nor did he bring or show any *results* of his qualification or of the camera he was describing; and, with all due respect to Mr. Brothers, to the best of my knowledge his work with a hand camera has never been seen at this Society's meetings.

Messrs. Thompson & Co. state they do not want a free advertisement, but it appears to me to be the only thing they do want, and I consider that the report did justice to the description, and that the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY would not have cared for more.

In conclusion I may say, that had I been reporting this meeting, I should have pointed out what I think was a novel feature, the finder. In using this finder you are required to hold up the camera before your face to find the picture, and in most classes of work in which the hand camera is used for, it would make the user look like a fool with a toy he wanted every one to see.—I am, yours, &c., A MEMBER.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange six-chamber revolver pistol for interior background.—Address, DOBBS, Bridge-street, Hindley.

Wanted, an A daylight Kodak in exchange for a first-class combined developing sink (lead-lined) and cupboard.—Address, ANDREW WEIR, 29, Grey Friars-lane, Coventry.

Will exchange capital ship's deck, wood accessory, cost 6l. 6s., for approved background or studio accessory. Photo sent.—Address, OCTAVIUS CARTER, Bournemouth.

Will exchange quarter-plate Underwood Instanto outfit for hand camera of good make; also moon accessory for carved chair or table.—Address, W. H. HORLINGTON, Crott-terrace, South Shields.

Wanted, good wide-angle rectilinear whole-plate lens in exchange for whole-plate rapid rectilinear lens in perfect condition.—Address, E. R. TURNER, 2, Claremont Villas, Montague-road, Heston, Hounslow.

Will exchange whole-plate camera, new, latest, all movements, one double slide, wide angle 10×8 lens, and cabinet portrait lens, for air brush complete.—Address, BOWMAN, 31, Wesley-avenue, Mutley, Plymouth.

Wanted enlarging lantern with eight-inch condensers and objective in exchange for whole-plate outfit camera, rapid rectilinear lens, three slides, case, and tripod; cost 20l.—Address, W. E. A. DRINKWATER, Wells, Somerset.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon.*

PHOTOGRAPHS REGISTERED:—

E. Landor, 2, The Mall, Ealing, W.—*Photograph of black-and-white cat.*

W. T. Hosler, 25, London-road, Wokingham.—*Photograph of screen in All Saints' Church, Wokingham.*

AUTOTYPE CO.—In our next.

H. M. WHITLOCK.—Messrs. Marion & Co. are makers of albums. They will supply your wants.

F. G. H.—1. Better use a pair of lenses. 2. Consult your local dealer on this point, stating your requirements.

R. DOBBS.—Paint the pedestal with ordinary paint of the stone colour, and when dry go over it again with "flatting" colour of the same tint. That is, the same as the paint but with the oil omitted—made with turpentine only.

INQUIRER.—As you do not say how you work, or what system you follow, or even if you are using albumen or gelatine papers, we cannot, of course, say the cause of your failure. If you send us fuller data, we shall be pleased to help you.

G. H. (Colchester).—This is a matter for a solicitor to deal with. He will frame an agreement so that you will not be liable for more than you agree to be. In such a matter as this we should not advise you to draw up your own agreement.

S. R. W.—The tissue, if made sensitive in the making, should, at this time of year, if kept under the usual conditions of keeping sensitive tissue, remain in good working order for two or three weeks. If it does not do this, *supposing it is carefully kept*, it must be faulty.

A. A. B.—If a suitable collodion be used, there should be no trouble about drying marks with the short exposure mentioned. In all probability, you are trying with a collodion made with a pyroxyline that yields a film of a horny character. Substitute one that gives a film of a more porous nature.

S. W.—The "sparkling points" in the enamelled prints sent are due to air bubbles enclosed between the print and the plate when it was squeegeed upon it. Their avoidance is simple. Take care that no air is imprisoned when the print is put upon the glass. This may, to a great extent, be prevented by bringing the print and plate in contact while under water.

J. E. E. (Leeds) writes: "Can you give me particulars for making collodion suitable for enamelling photographs. I use a large quantity, and want to make in big lots?"—Ether (·720), 8 pints; alcohol (·820), 8 pints; pyroxyline of not too powdery a character, 6 ounces; castor oil, 1 ounce. If methylated alcohol be used, it must not be less than the strength given, and it should be free from mineral spirit.

H. VOSS.—The expansion of the paper is the cause of the distortion. The so-called "parchment paper," or "vegetable parchment," expands considerably when it is wetted, and much more in one direction than in the other. Further, it is stretched considerably in the tension put on in the straining to get it flat. If the work is required strictly to scale, substitute glass plates for the paper, and you will have no difficulty on that score.

R. PARKER.—It is quite a fallacy to suppose that the reproductions of paintings made on the Continent, are made from monochrome copies of them prepared by the painters themselves. Such an idea prevailed some years ago, but we very much doubt if it had any foundation in fact. We do know that the fine reproductions of paintings, seen in the shop windows and produced on the Continent, are made from the original paintings in all their bright colours.

PROCESS.—An extemporised screen, made in the way proposed, would be of no use at all for practical work. We may add that it would be more misleading than otherwise in experimental work. With a properly ruled screen you will know where you are—that is, whether the results, if failures, are due to your want of experience. With the proposed screen your results could not be good, and with your inexperience you would not know what was attributable to the appliance, and what to yourself.

T. EDWARDS says: 1. "I work bromide paper with a metol developer, but have a difficulty in precipitating my old hypo bath residues which I save in a tub. Have tried liver of sulphur and also hydrochloric acid, but neither clear the stuff, as upon dipping out same and adding a little more acid it all turns milky again. What do you advise? 2. Should I save my exhausted developer separately, or may they both be put together in the tub? Thanking you in anticipation for advice on the matter."—1. Liver of sulphur will precipitate all the silver. Of course, if hydrochloric acid is added, sulphur will be precipitated and cause the milky appearance. If, instead of hydrochloric acid, liver of sulphur is used as a test, the complete precipitate of the silver will be ensured. 2. Throw the exhausted developer away, as it contains no silver.

W. GEORGE.—Unless the paper is discoloured, or the print is on a tinted ground, there will be nothing gained by the use of orthochromatised plates. If the paper is yellow, the case would be different.

S. H. DAGG (Mussoorie) says: "Will you kindly, in your 'Answers to Correspondents,' inform me the cause of the print sent under cover going into this condition? It has in many instances occurred, and I am most careful that my printers well wash their prints. My mode of washing is twenty-four changes at night, left soaking in water until next morning, then washed in two changes of warm water, and afterwards about twelve washings in ordinary temperature. Thanking you in anticipation."—The fading is no doubt much accelerated by the long soaking in water. The twenty-four changes of water, if the prints were well attended to, would be ample, and the longer soaking does harm. As the fading seems to take the form of the markings of the brush with which the mountant was applied, it would seem that the latter is not altogether above suspicion of hastening the fading.

J. ROBERTS writes as follows:—"1. In your paper a short time ago I saw a method of making waxed vignetters. I have tried it, but cannot meet with success. I have used matt-surface single and double albumenised papers, but cannot get any density. I have under-printed, correctly, and over-printed, and have obtained all shades of colour, but they all appear, when waxed, so fearfully thin, as enclosed specimens, and consequently unfit for use. Is there any method of intensifying them, or any other way of getting a nice black? Trusting you will help me out of this difficulty. 2. In your formula in THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC for ground-glass varnish, I cannot get the ether and benzole to mix, they appear one on the other. When mixing once before, it turned like sour milk. What is the cause? I suppose benzine does instead of benzole."—1. The example sent is too thin. Either the action of the light was not sufficient, or the paper was too lightly sensitised, so that too little silver was reduced to secure opacity. 2. If the varnish had been compounded according to the formula given in the ALMANAC it would be all right. The resin should be first dissolved in ether, and the benzol added afterwards. There is a difference between benzole and benzine; it is the former that is to be used.

YANKEE (Woodland) writes: "In looking over the advertisements in your JOURNAL, I notice that your dry-plate patrons all advertise lantern plates which give warm or black tones at will, and some even stating that their plates (warm or black tones) can be used in reduction. I should judge that these are chloride plates, or at least bromo-chloride plates, and, if I am right in my surmise, would you kindly inform me, through your columns, if the manufacturers do not have trouble with their keeping qualities? All the American lantern plates that I have had any acquaintance with, I think, are bromide pure and simple, and it is a hard matter to get a warm tone on them. Perhaps in the "parent country" the plates do not generally remain long enough on the market to try their keeping qualities. P.S.—All the formulæ I have ever seen given for chloride and bromo-chloride emulsions would not give speed enough to use with any pleasure in a reducing camera. Hoping to see an early reply in your columns."—English lantern plates give, by following the instructions supplied with them, warm or cold tones at will. Of course, English makers, like those in America, do not publish the formula by which they prepare their plates. With regard to the keeping qualities, we a few days ago exposed some commercial lantern plates (by reduction) that had been in our hands two years or more, and they were as good and rapid as we could desire. Surely your firm can turn out plates as good?

PROPOSED MEMORIAL TO THE LATE J. TRAILL TAYLOR.

NUMEROUS suggestions have been made that the memory of the late J. Traill Taylor should be perpetuated, and his long and valuable services to photography recognised in a permanent form.

It is proposed to call a meeting, to which all those interested are invited, for the purpose of appointing a committee to carry the idea into effect. This meeting will probably be held on Friday evening, December 21, at Anderton's Hotel, Fleet-street, London, at eight o'clock. Next week we hope to be in a position to make a definite announcement with respect to it.

A number of gentlemen have already met and invited Mr. Alexander Mackie, of 3, Upper Baker-street, London, N.W., to act as Hon. Secretary, which Mr. Mackie has consented to do.

CONTENTS.

	Page
THE ALMANAC	769
CARBON PRINTING WITHOUT TRANSFER	769
THE REVERSED NEGATIVE PROCESS IN PRACTICE	770
WHO IS THE INVENTOR OF THE KINETOSCOPE? By A. T. STORY	772
COLOUR (?) PHOTOGRAPHY. By JULIUS F. SACHSE	773
DOINGS AT THE CAMERA CLUB	773
ON A METHOD OF PHOTOGRAPHY IN NATURAL COLOURS	774
NORTH MIDDLESEX PHOTOGRAPHIC SOCIETY'S EXHIBITION	776
EXHIBITION OF THE LEYTONSTONE CAMERA CLUB	777
OUR EDITORIAL TABLE	778
NEWS AND NOTES	778
RECENT PATENTS	778
MEETINGS OF SOCIETIES	780
FORTHCOMING EXHIBITIONS	782
CORRESPONDENCE	782
EXCHANGE COLUMN	783
ANSWERS TO CORRESPONDENTS	784
PROPOSED MEMORIAL TO THE LATE J. TRAILL TAYLOR	784

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TRANSFERRING FILMS WHILE WET.

We wish to explain in this article how very simple an operation is the removal of a wet film and its transfer to a plain piece of glass. There is nothing novel in the process, yet, if you were to take a poll of the photographers who, when they have a cracked negative, make any attempt to remove it from its first support and place it on another plate free from injury, we should find an exceedingly small number who have ever even attempted to carry out this simple mode of remedy. Instead of doing this, all sorts of dodges are tried to get rid of the effect of the crack in the printing. But not alone is there an advantage in remedying a broken negative; while performing the transfer, it is just as easy to reverse the film as to place it in its original position, and we have then a plate suitable for carbon printing or collotype work.

Then, again, though frilled plates have for a long time been of exceptional occurrence, occasions do arise when the defect is experienced, and particularly is this the case with a recently introduced make of plate which, possessing, as it does, certain positive advantages in a particular direction, are very liable to frill. We have seen a negative on one of these frill in half a minute's time for a distance of two inches from the margin. Under such conditions, though it is possible to reduce the frill by alcohol, there is usually a difference of density between the frilled margin and the rest of the plate. All that then is needed is to remove the entire film and place it on a fresh glass; the frilling does not show, and a perfect negative is the result.

The removal of the film is brought about by simply leaving the negative to soak in a dilute solution of almost any acid, the effect being the gradual entire loosening of the gelatine film. When this method was first published, and for some time afterwards, the use of hydrofluoric acid was considered necessary; but we believe Professor Burton was the first to point out that the solvent action of this acid upon the surface of the glass was not, as was thought, the necessary element in the loosening; he pointed out that almost any acid would produce the same effect. Possibly citric acid is as suitable as any, but sulphuric, hydrochloric, nitric, and other acids are also effectual. Nitric acid is contra-indicated on account of its solvent action on the image, but we have, under stress of circumstances, used it without any apparent deterioration of the negative. We may here point out that, concurrently with the loosening of the film, an enlargement of its dimensions also takes place. There are occasions when this is an actual advantage, and when working with large plates it is not often the case that the size and proportions of the view or portrait are so accurately arranged that an enlargement would be a detriment. It is, however, necessary, if enlargement of the negative be contemplated, that it should be more dense than usual, for it goes without saying that if, say, a square inch of image be spread over two square inches, it will possess a decreased light-obstructing power. These, however, are side issues on the main question, and it will not be needful to do more than thus cursorily to refer to them.

We will suppose a cracked negative is under treatment, the film itself being, of course, understood to be unbroken. If it is varnished, the varnish will, for the process we discuss, have to be removed. Soaking for some time in methylated spirit, followed by successive washes of fresh clean spirit, will usually suffice, without any potash or other addition, although a few drops of ammonia in the last spirit will prevent any possible precipitation of the shellac of the varnish upon the plate.

The varnish removed, the plate is removed to a five per cent. solution of acid in water. After the lapse of an hour or two the film may perhaps be seen floating above the glass, or it may be still adherent in one or two places. In the latter case a firm, but gentle, pushing with the finger will cause the adhesion to give way. The broken glass can then be removed and a larger piece placed under the film, after which glass and film may be transferred to another dish of water, and finally into another of distilled water. A good sample of tap or river water will answer; but, if the supply contain much lime, it should be rejected, for obvious reasons.

At this stage all that is now required is to slowly and carefully lift glass and film out of the water. This can easily be done by pinching the film to the glass at one side by the finger ends, raising that end slowly, tilting the whole and withdrawing it gradually, and setting it up to dry. It will usually adhere without any substratum, though, if necessary, the final support may have a covering either of gelatine or collodion, washed before it is dry. If it is found that, when the film and its new support are removed from the water, it is not quite squarely placed upon the glass, it can be, without any great difficulty, adjusted with the fingers.

If the negative is to be reversed, the film while in the water may be turned upside down without the slightest difficulty.

So far, we shall have a negative enlarged from its original dimensions, and this is the best way in which to obtain facility

in an operation which is really far more simple than this description would suggest. If it be desired to reduce it to a smaller, or its original dimensions, the film must be transferred to a bath of methylated spirit; it will then quickly shrink to its proper, or even a smaller, size. The operation of transferring is just the same, but it must be very quickly performed or wrinkles in the film may be produced.

Finally, it may be observed that the extent of this shrinkage may be reduced by diluting the spirit with a small quantity of water, which, at the same time, will reduce the difficulties of transferring with spirit.

If at any stage it be found that a bubble of air has become imprisoned, it may be squeegeed out by the finger or by a mop-shaped camel's-hair pencil. When the transfer is out of the spirit, cases may arise where it would be advisable to immerse the whole in the liquid again, and work the bubble away while all was underneath the surface.

In conclusion, we would say, that any of our readers who have never attempted this simple mode of transfer will be surprised at the ease and simplicity with which it may be performed.

LINE REPRODUCTIONS ON EMULSION FILMS.

Now that dry plates seem in a fair way to take a permanent position in the practice of "process" work, it may not be out of place to consider in what respects the emulsion film differs in its nature from that of wet collodion, and the consequent variations in manipulation that will be necessary in order to adapt the new means with the best prospects of success. More especially does this review of the circumstances seem desirable, since it is probably the variations in the characteristics of the two methods, more than any inferiority on the part of emulsion films, that has stood so long against their adoption, and the same reasons may still continue to militate against them unless those variations are thoroughly recognised.

In the present article we do not intend to devote any special attention to the use of dry plates for half-tone etching purposes, because, although for this class of work it is natural that there should be differences in the method of procedure, those differences are more immediately connected with the peculiarities of the screen itself, and are of a mechanical rather than a chemical nature, whereas the points we wish to draw attention to have a more direct relation to the chemical differences that exist, and that affect equally the application of emulsion films to pure line or to screen work.

The starting point of all the difference lies, of course, in the substitution of chemical for physical development—of alkaline pyro, or one of its congeners, for the old method with acidified iron or pyro. This means that, in place of an image formed entirely on the surface of the film, we have to deal with one that is primarily formed in the film, and at the expense of the bromide of silver it contains, and it is chiefly in connexion with the subsequent treatment of this primary image that the difficulties of working the new process are met with, simply because the difference is ignored or not recognised. We shall, in the first place, speak generally of emulsion films—gelatine or collodion—leaving the minor question of the physical difference of the vehicle for separate consideration, and confine ourselves to the chemically produced image and the direction in which it affects the ordinary practice.

The first obstacle encountered, no doubt, by all on first attempting line work upon dry plates, under which heading we must be understood to class all processes in which the chemical developer is used, is the difficulty experienced in obtaining clear and sharp lines combined with an adequate degree of density. For the immediate purpose in question, as is well known, the utmost density is required combined with absolute clearness or absence of deposit in the shadows; and, if these requirements exercise the utmost skill on the part of the wet-plate worker in their attainment, the task is even more difficult in the case of a dry plate, unless the mode of working is altogether altered. The main cause of the difference in behaviour is essentially in the formation of the image in the two cases, consisting as it does in the wet plate of a *deposit* of silver upon the surface, and in the dry plate of a *reduction* of the metal within the film. With the wet plate and everything in good order, it is comparatively easy up to a certain point to keep the finest lines of the picture clear and free from deposit, and to go on "piling up" the silver on the exposed lines in order to secure the requisite density. We say, "up to a certain point," because a point is reached at which it becomes difficult to heap up any more silver upon the finer lines without its encroaching upon and filling up the intervening clear spaces; and, in fact, the only real difficulty the careful worker experiences is in preventing the filling up of these finer spaces, and it is consequently only in that direction that his energies have to be exercised beyond keeping his chemicals in thorough working order.

In the development of a dry plate, however, the circumstances are altogether different. The action, of course, commences at the surface, but the progress of the image, instead of consisting of a constant building up of fresh particles on the top of those previously deposited, is of precisely the reverse character, its growth consisting of the gradual reduction of fresh molecules or particles of silver below those first reduced, the vigour of the impression increasing as the developer penetrates into the film. The ultimate intensity of the reduction in any particular part of the film depends upon the extent to which the action of light has penetrated, and, provided sufficient time is allowed for the developer to act fully, the gradations of the image would be duly rendered in the exact terms of the action of light, if only it were not for complications. Thus, simultaneously with the downward action of the developer or spread of the image, there is a secondary action in a lateral direction; or, rather, in all directions from the particles first reduced, and this abnormal reduction is proportionately greater as the original impact of light has been greater.

We need not here enter into any argument as to the real cause of this lateral spread of the development, or whether it arises from chemical or mechanical causes, it suffices for our purpose to point to its existence. But, bearing it in mind, it is very easy to see that, starting with a perfect surface image, the longer the development is continued the greater will be the departure from perfection by reason of the abnormal action referred to; and, further, that the fullest force of this action will be felt in the very parts where it can least be tolerated, that is to say, in the highest lights, or where the lines or dots are finest and most closely located.

It would seem at first sight, therefore, that emulsion films were physically disqualified for use in process work on this account, and, if treated from a purely wet-plate point of view, such would, no doubt, be the case; but, in reality, all that is required is a different method of treatment. In the case of a wet-plate image, the development or redevelopment—*i.e.*, in-

tensification by means of silver—is stopped as soon as any tendency to filling up of the fine lines becomes manifest; and, should any further density be necessary, it is obtained by other means, which operate only on the deposit already formed, without spreading on to adjacent parts. Reasoning by analogy, the same method of treatment appears to be the most, if not the only, rational course to pursue in the case of dry plates, though, because density is more easily obtained by a continuation of development, the ordinary operator is too prone to adhere to that method, and to blame the process for the inferior quality of his results.

With many of the specially prepared "process" plates now commercially obtainable, as well as with collodion emulsions, the inconvenience of this lateral spreading of the image is reduced to a minimum, though it involves a serious practical loss of sensitiveness, and with such films it is, under proper treatment, easy to produce as perfect results as with wet plates, and probably with far less attendant troubles when the case of the bath is to be taken into consideration; but, instead of developing right away to full density, as may be done in half-tone work, the action should be stopped at a point before the slightest filling in of the finer lines have commenced, and the full density arrived at by one of the methods of intensifying that has no tendency to fill in the shadows.

In order to arrive at the most successful result, it stands to reason that some departure from ordinary half-tone methods is necessary, and these consist in so arranging exposure and development that a comparatively strong image of the whole subject is produced quickly. By this we mean that the lines or dots in the darkest shadows of an engraving should appear and gain density almost simultaneously with the high lights, so that, when, on account of the latter beginning to fill in, it is necessary to stop development, the former may have sufficient robustness to come well within the power of the intensifier. If the development be conducted on the gradual or tentative system, which gives the best results for landscape or portrait purposes, the probability is that, if the shadow details have made their appearance at all when the lights begin to fill in, they are so feeble as to be practically beyond the range of intensification, and for this reason inexperienced workers with dry plates persist in carrying development too far to eventually secure any decent result, trusting to clearing solutions—of which more anon—and other subterfuges to remedy matters.

What we have to aim at, then, is to produce, if we may so term it, a flat, strong image. Contrast between the black and white of the picture we must have, but as little contrast as possible between the whites of the lights and shadows respectively. To attain this we must employ first of all a "full" exposure, so as to well impress the faint touches of white in the deep shadows as well as the broader lines of the high lights, and to follow this up with an energetic but well-restrained developer. In the use of the restrainer, however, it must always be kept in view that its action is proportionately greater in the more feebly impressed portions, and therefore it is not judicious to overdo it. On the other hand, a too energetic developer is apt to defeat the end by filling up the high lights in spite of the restrainer. In practice a judicious combination of one or other of the newer reducing agents with caustic alkali and bromide we have found to give the best results with gelatine plates, while with collodion emulsion we have not yet found anything to displace pyro and ammonia.

A word may be said on the subject of clearing solutions, on the use of which the wet-plate worker depends for much of his success. Here, again, the difference in the constitution of the two images places them in very different positions, since, in the wet plate, with the image entirely on the surface and built up gradually, it is not only more readily amenable to the action of a clearing solution, but the very portions it is desirable to clear away—fog, veil, or filling in of the lights—are the ones first acted upon. Hence it is that a wet plate, with the finer lines badly filled in, may be treated with a solution of iodine in cyanide of potassium until they are perfectly clear and sharp, and subsequently intensified to any extent; in fact, any amount of fog, if produced by development and not by a disordered bath, can be easily cleared in this manner.

Not so with an emulsion film, since the veil, or whatever name may be given to it, is necessarily more or less in the film, even when solely due to faulty development, and consequently its removal entails a very serious weakening of the image, if it can be effected at all. Indeed, for practical purposes, where really good results are in question, we doubt whether clearing solutions are of any use at all with dry plates as applied to process purposes; for, if the veil be superficial enough to be removable, its effect when intensified will be less detrimental than will the general weakening of the image and upsetting of gradation that must result from the use of the clearing solution. Of course, there are circumstances under which a clearing or reducing solution may prove useful for other purposes, but we think not in the same way that it is applied to wet plates; but these do not come within the scope of the present article.

In conclusion, we would only say, to those who take up dry plates for process work for the first time, that, if they will only try them fairly, we think they will not find them wanting. But, in order to give them a fair chance, it is necessary to thoroughly understand or recognise the essentially different principles on which they are worked, and the foregoing lines are intended to indicate the chief points of difference.

Silvering Mirrors.—A curious method of silvering mirrors has recently been patented by M. Hans Boas, of Kiel (says *Engineering*). It is based upon the fact that, when one of the heavy metals forms the cathode of a vacuum tube, containing a trace of hydrogen, the metal is volatilised by the current, and is deposited as a firmly adherent and highly polished layer on the walls of the tube. The mirror thus produced is said to be of much greater brilliancy than can be obtained by ordinary methods.

A Photographic Poster.—Some time ago we commented upon the enterprise of the Leeds Photographic Society in issuing a striking photographic poster for drawing attention to a lantern lecture. A second photographic poster, but one of a different nature, has just been shown us by Mr. Maskell. It was issued by the Salon Photographique, of Brussels, for the Exhibition (a very good and successful one we hear) held there in November. The poster is beautiful in design and gorgeous in colouring, sunflowers and the now familiar emblems of the Linked Ring supplying the motives of a really effective scheme. We understand that Mr. Gleeson White, who early next year discourses at the Society of Arts on Posters, will include this specimen among his exhibits.

Carbon Printing Appliances.—Mr. Leslie Selby did good service in the cause of carbon printing, in his recent paper before the West London Photographic Society, when he called attention to the fact that the special apparatus, sets of which are quoted in price-lists, are quite unnecessary. There is no question, we think, that the expense of these sets, which some have thought

to be absolutely necessary, has deterred many amateurs from essaying carbon printing. Mr. Selby, in his paper, gives some practical hints on what he himself employs, and compares the outlay necessary with that given in the estimates for sets. Amateurs who may have, hitherto held aloof from carbon, owing to imaginary costly appliances being essential, will do well to read Mr. Selby's remarks. The complete sets, if cost is a secondary consideration, are very convenient, as then the novice is assured that he has all that is requisite for the work; this was doubtless the reason why, when the carbon process was young, its promoters quoted them. Mr. Selby points out that the ordinary amateur already possesses nearly everything necessary for carbon work, and what he has not got may be obtained for a mere trifle.

Storms and Studios.—The violent storms and gales of last week must have sorely tried many photographic studios, particularly those of the old type, which were built more with reference to the light they would admit than with regard to their stability. With a pressure of wind at between twenty-three and twenty-four pounds to the square foot, as was registered at Greenwich, it is surprising that some were not wrecked entirely. As it is, many have felt the effects of the pressure, which will, doubtless, show itself by increased leaking of the roofs. Even a slight bending of the sash bars causes old and hard putty to crack and separate from the glass or frame, with the result, during heavy rain or melting snow, that water gets freely within the building, as witness the stained blinds and accessories so frequently seen. Two or three coats of good oil paint, at intervals, per year, will serve to retain the putty in a more or less elastic and adhesive condition, so that it will not be so liable to crack with a slight "giving" of the sash bars. A coat of paint even now, on a fine dry day, will save a deal of inconvenience a little later on. The wind pressure just mentioned, though heavy, is not so heavy as is sometimes registered, and that should be kept in mind by those designing new studios.

Wages and Work.—Some months ago, it will be remembered, there was a correspondence in these columns on the wages some photographers paid, or offered to pay, for efficient assistance. That arose out of an advertisement offering twelve shillings per week and live in for seven days' work for a skilled operator, retoucher, and one who could assist generally. The correspondence clearly showed that the labour market, so far as males, at least, were concerned, was considerably overstocked. It would now seem that the labour market, as regards females, is in a very similar condition. Here is an advertisement which recently appeared under the head of "wanted:"—"Young lady for workroom. Must be good spotter and mounter, and willing to assist generally. Permanent situation. 10*s.* weekly. Must live near." It is difficult to conceive how a *young lady* can pay for lodgings—she must live near—and board, as well as dress herself as befits a young lady, on the munificent wages—or *salary*—of ten shillings a week. We sincerely hope that this is not to be taken as an example of the salaries paid to efficient female workers in photography. If it were, we should advise young ladies and their friends to hesitate before they "give time," or pay premiums, for apprenticeship in photography.

Improving Negatives.—At a recent meeting of one of the suburban societies the question of the improvement of negatives arose, more especially with reference to the alteration of the character of the negative. A suggestion was made that the best way would be to reproduce it. A few weeks back we had an article on *Mechanical Methods of Improving Negatives*, and those will, in the majority of cases, answer all purposes; but there are, obviously, instances where those methods will not do all that may be desirable. For example, a negative may be so thin—and resist intensification—that good prints are impossible; or so dense, from general stain, that it is impossible, at this season, to obtain a print within a reasonable time. Such negatives are frequently cast aside as being worthless, yet by reproduction good ones may be obtained from them. Here is interesting work for winter evenings, for it can as well, and better, be done by artificial as by natural light and by contact printing. It is surprising how seldom amateurs resort to the reproduction of negatives that it is impossible to retake. There are few negatives so feeble that vigorous ones cannot be obtained from them; or, on the other hand, so dense or stained that they will not yield, by reproduction, negatives of ordinary printing density.

The National Portrait Gallery.—Mr. Watts, R.A., has just made a handsome gift to the National Portrait Gallery of seventeen paintings by himself—portraits of illustrious individuals. Amongst the number may be mentioned Thomas Carlyle, Sir Andrew Clark, Earl of Lytton, Cardinal Manning, John Stuart Mill, Lord Tennyson, and others of equal note. This gift is a valuable addition to the collection of paintings. Up to the present no note has been taken of photography in connexion with the National Gallery of portraits. At the time the building of the new premises for the reception of the collection was projected, we suggested that a portion of the building should be set apart for photographic portraits. Many there are, and have been, who have distinguished themselves in the world of literature, science, &c., whose counterfeit presentments should find a place in our National Gallery, but there are no oil paintings of them in existence, or, if there are, they are in the possession of relatives, who prefer to keep them and not present them to the nation. Photographs, however, are available, and might be utilised either as enlargements or direct prints by one or other of the permanent processes. In a National Portrait Gallery one may fairly assume that the object is portraits rather than works of fine art. By all means let us have as much art as possible with the portraits; but if high art is not forthcoming, let us not be debarred from having the portraits, even though they be the humble photographs.

Proposed Memorial to the late J. Traill Taylor.—There has been a generally expressed opinion that the services rendered to photography by the late Mr. J. Traill Taylor, and the kindly way in which he was wont to place his services at the disposal of every one who invoked his assistance in any matter connected with photography, should be commemorated in a lasting and fitting manner. In order that there may be an opportunity for the discussion of the matter, a public meeting, to which all interested are invited, will be held at Anderton's Hotel, Fleet-street, E.C., on Friday, December 20, at 8 p.m. Sir Henry Trueman Wood, M.A., President of the Royal Photographic Society, will take the chair. A list is appended of the names of those who have already signified their desire to serve on a General Committee for giving effect to the movement, and gentlemen who wish to join the Committee are requested to send their names to Mr. Alexander Mackie, 3 Upper Baker-street, N.W., who has undertaken to act as Honorary Secretary.

PRELIMINARY LIST OF COMMITTEE.

Sir H. Trueman Wood, M.A., A. Pringle, F.R.M.S., T. C. Hepworth, F.C.S., Henry Sturmey, C. R. Rowe, E. J. Wall, T. Bedding, J. Spiller, F.I.C., F.C.S., R. P. Drage, F. A. Bridge, Frank Haes, T. R. Dallmeyer, F.R.A.S., Major Lysaght, F. Hollyer, J. Cadett, G. Scamell, P. Everitt, E. W. Foxlee, R. Child Bayley, J. A. Sinclair, W. D. Welford, E. W. Parfitt, F. Miall, G. C. Hance, J. W. Marchant, H. Wilmer, E. Clifton, A. Rayment, A. L. Henderson, A. Haddon, G. W. Webster, W. B. Bolton, Geo. Mason, J. Stuart, John Stuart (Glasgow), A. Seaman, A. Mackie.

THE ARTIGUE PAPIER VELOURS AND DIRECT PIGMENT PROCESSES.

NOT many years ago it was comparatively easy to say by what process any print at an Exhibition had been produced, and by what methods particular effects had been arrived at. At the lately closed Exhibition of the Photographic Salon, however, there were, on the one hand, several examples which, if attention had not been called to them, would have been set down as the outcome of the most popularly known processes; and, on the other hand, there were some which baffled inquiry as to the particular method used by their pro-

ducers. In the latter category it will be sufficient to mention, first, the beautiful examples of Dr. Hugo Henneberg, which hung right and left of the large central picture by the same artist, this being, of course, a carbon print. The other two were of a rich, warm, brown colour, and, in addition, by clever management of the lens, combined with the admirable printing method, an effect was given, especially in the foliage, which recalled, more than anything else, a bitten plate. Then there were Mr. Valentine Blanchard's application of printing from autotype tissue without transfer, and Mr. Craig Annan's portraits and landscapes, which may or may not have been printed upon linen. It will suffice to say that they were carbon prints, but a close examination, as they hung under glass on the wall, would fail to detect with certainty the material used, or even the printing process. Again, from the same point of view, two of the most interesting pictures in the Exhibition were Mr. Puyo's *Vengeance* and *Sous la Lampe*. The supposed fact, which has been dinned into our ears in every text-book and at every lecture on the subject for ages past, that it was useless to attempt to develop a carbon print from the front, that the pigment must inevitably float off, or that, at the best, it could only produce blacks and whites, without half-tone, would certainly have prevented most inquirers from guessing that these prints, of the highest perfection so far as reproduction is concerned, could have been the outcome of a system pronounced to be an impossible one to work. It was taken for granted that they were in platinum, or perhaps bromide. And yet these fine effects, these deep, rich blacks, these pure whites, this perfect gradation of tone, this clear minuteness of delineation, showing every letter in the small book which the figure seated at the table holds under the lighted lamp, were produced by the simplest of all processes, viz., on paper directly coated with a black pigment and developed from the front without transfer. They were examples of the Artigue Papier Velours, and no more perfect ones, none more satisfactory, so far as the value of this process is concerned, could perhaps be desired. On the opposite wall hung many beautiful specimens of direct pigment printing by M. Demachy, on paper prepared by himself, and, near by, one or two others by the same method, which probably escaped general attention: a simpler method perhaps even than that of M. Artigue—when you have mastered it. But it is a difficult one to master.

We move slowly in this country when it becomes a question of adapting inventions whose origin has not been found amongst ourselves. We are apt to look contemptuously on things made in Germany; we are conservative in our habits, and it is, no doubt, pardonable if manufacturers, having set up a large plant at great expense, do not look kindly at innovations which may threaten to render their machinery useless. A considerable amount of interest and curiosity, however, has been attracted, if slowly, to this French paper and kindred applications of pigment printing which have been so long denounced as impossible. It is vaguely known that sawdust development has something to do with it (to some perhaps suggesting all kinds of difficult chemical reactions), and the very fine examples shown at the Conference on this subject at last year's Salon were admittedly superb, though it was said that they were *tours de force*, specially made, which could not be repeated. But, besides many others, the pictures shown this year will remove all doubt on the matter, and some account of this method of printing, with the improvements recently introduced, and of the similar method used by M. Demachy and others, may not be without interest.

The Artigue paper, when of good quality, and properly used, may be said, for delicacy of delineation and other characteristics, to be equal to any other paper now in the market, both for pictorial and for scientific work. For what we call artistic work in photography, I still think that it is better to coat the paper oneself; but this is undoubtedly a matter of difficulty, requiring a considerable amount of practice, and very few will have the patience and other necessary qualities to succeed in so doing.

To take, however, each case separately, and first the Artigue Papier Velours. This is, at present, coated upon a paper of medium roughness, slightly rougher perhaps than the AA. of the Platinotype Company, and with an excellent and even grain. How far it may be possible to proceed in the direction of rougher papers, one cannot at present say, but there is little reason to be dissatisfied with the paper at present in use. The coating is of extraordinary fineness and homogeneity, a pigment of some peculiar black, mixed with a little gum, and possibly some gelatine or glue also. Viewed by reflected light, it is a dead, velvety black, and so soft that a moist finger easily removes it. By transmitted light the paper is transparent, with a quite light grey appearance, very regular indeed, with no apparent surface faults. The secret of its quality, in fact the whole secret of preparing paper for development from the front, is the extreme tenuity of coating, and the perfection of evenness in which the pigment is held in suspension, allowing of its absolute regularity in distribution. What the pigment is, what the colloids, and how the coating is effected are still the secrets of the maker.

The paper is supplied unsensitised, and in that state will, of course, keep indefinitely. The earlier method of sensitising was by a tedious and somewhat difficult process of brushing on the back. In my paper on the subject last year I showed that a simpler way, that by immersion, was quite as efficacious, and seemed to present no differences in result, except perhaps an increase of sensitiveness. At first, also, development was effected with baths of comparatively high temperature. Now, development is practically cold throughout, at least at a temperature no higher than that of water in summer. A brief statement of the manipulation will be useful.

To sensitise, prepare a two per cent. solution of bichromate of potash in a flat dish. Immerse the paper in this gently to avoid air bubbles for two minutes, and hang up by one corner to dry in the dark. As the pigmented surface is so very tender and easily rubbed off if touched when wet, I find it convenient to put a little metal clip at each corner of the paper, to lay it on the bed of the dish, flow the solution over, and handle by the clips only.

Exposure is made with an actinometer in the usual way, and the paper, when fresh, has quite three times the sensitiveness of silver paper, say about the same as platinotype.

For development, sawdust in the state of a pretty thick soup is used. Of course, this is of no necessity; a brush, rocking, laving, flowing from a sponge, plain water, and other ways would develop in time, but the sawdust, which is in extremely fine powder, is, by its soft, rubbing action, very useful. Make, then, in a large, very deep, earthenware pan, a thick soup of this sawdust and cold water, and have ready a coffee-pot or similar utensil, with a very wide (about an inch wide) spout. After exposure, take the paper and place it in water at as near as possible seventy degrees (not more). In two or three minutes a faint image will be seen. Lay the paper on a sheet of glass, and, placing this on an easel over the pan or, holding it in the hand, pour the sawdust mixture along the top of the print, letting it run down back into the earthenware pan. At first the sawdust mixture should be taken from the top; afterwards, by dipping down and stirring up, it may be taken thicker. The character of the negative and the degree of exposure will determine the thickness of the developing mixture and the manner of applying it. Evidently also local development is extremely practicable, and the touch of light brushes, or other means, will come into play, for, even where affected by light, except where it is very deeply printed, the pigment is still soft and soluble, and amenable to treatment. Every now and again a dash of cold water will reveal the picture and satisfy us as to the progress of the development, and, finally, the usual alum bath, to discharge the bichromate and harden the pigment, will complete the print. Throughout, the operations have been with cold water only. There has been no anxious inspection of thermometers, no squeegeeing, no transfer from one support to another, no pressure between blotting boards; we can suspend and take up again development when we will; there is no film to blister and leave the paper, no safe edge to make to the negative, and, finally, there is no reversal, end for end, of the picture, but we have a true positive from a negative, even as in silver printing. We have left also little else but pure colour on the surface of the paper, without the disagreeable soapy gloss of a thick gelatine film holding it there in suspension.

Few words need be said regarding the preparation of pigmented paper oneself, and those who saw Mr. Demachy's beautiful work at the Salon accomplished by this method will readily concede the praise which it merited. It is the most personal of methods which we yet possess in photography, and is full of possibilities—of possibilities which will develop year by year as the Exhibition of the Salon comes round. The personality of the worker is so intimately connected with the results, from the coating of the paper to the finished print, that no rules can be laid down. Throughout, the hand of one skilled with the brush, even in the earlier stages of laying the ground to be worked on, is essential. But there may be some who may wish to be put on the track, and to whom therefore a few practical hints may be of value. They will vary them afterwards as they please, and profit by their own experiences. My recapitulation of one system of working need only, then, be brief.

Any paper which has been sized will do. The materials are a ten per cent. solution of bichromate of potash, a saturated solution of gum arabic, and any moist colours in tubes. Refined lamp-black may be used, common red ochre, with or without addition, say, of blue to modify the colour, or any other vegetable pigments. The essential is to give as thin a coating as possible to the paper, with the pigment evenly distributed and the coating uniform in thickness. No for-

mula can be given. It will differ with the pigment employed, and must be learnt by experience; for, if the coating mixture is too thick, it will clog before it can be softened over with the softener; if too thin, it will separate into round spots of colour, which will not again assimilate with the remainder. The ease of coating, then, depends upon the mixture of the gum, bichromate, and pigment in correct proportions. But suppose we have a mixture of equal parts of the three ingredients. Take a flat hog's-hair brush, and, having first pinned the paper on a board, brush the colour rapidly all over it with even strokes with a tolerably full brush, and always in the same direction. Then, with a badger's-hair softener, go all over it in all directions, first with more or less strength, then with a lighter touch, or delicately flicking it till it has become as even as you are able to make it, and so thin that you can see the grain of the paper through the colour. With opaque colours, such as lamp-black, of course less of the pigment will be used. With others, more of the pigment will be necessary and less gum, otherwise the mixture would be too thick. The best plan is to begin with thin mixtures, and to tentatively increase the consistence by the addition of gum or pigment, until that which is most easily handled results. The depth of colour in the resulting print will, of course, also be affected by the amount of pigment employed. The whole thing is, however, a matter of personal practice, remembering that the *desiderata* are the thinnest possible coating applied with the greatest regularity. If these conditions are obtained in perfection, the paper is fit for any work, however fine, and we may remember also that for certain effects even these conditions may be modified.

For development various means and various implements may be used and will suggest themselves, and this question need not now be entered into at length. Sawdust, as in Artigue's system, may be useful, and various kinds of brushes. The object, of course, is to remove the still soluble pigment, where and in such proportions as we may wish to do. One good mechanical way is to place the wet print on a piece of glass, and to squeeze a sponge on the glass just over the top of the print, the sponge being dipped into water colder or warmer as may be required, so that the stream of water flows down over the print. But there are all kinds of methods, and to those who will try this process nothing could be more absorbing or fascinating. From first to last you are working personally at every portion of your picture. Nothing is being blindly done for you by chemical reactions. Your faults are your own faults, and are capable of correction, even if it is necessary to begin over again. They are not the result of the imperfect direction of a machine.

M. Demachy's pictures naturally called forth various criticisms, and it is not surprising that the hackneyed charge of imitating wash or chalk drawings was one of them. But, if such pictures resemble water colours, what more natural or inevitable, for they are themselves neither more nor less than water colours—water colours in which the colours have been fixed on the paper by the agency of light? There is here no question of chemical reaction, no substitution of metals or gilding of deposited silver. There is only pure pigment, water, and gum, and some bichromate of potash. From first to last, if any pictures justified the assertion in the forewords to the Salon catalogue, they were these; for, as the critic of the *Art Journal*, better informed than most of his colleagues, shrewdly says, "this Society has the boldness to say openly, what every one knew privately who has ever handled a camera, that 'very little knowledge of chemistry, optics, and mechanism is in any way necessary' for pictorial photography. . . . . All that is necessary to produce good photographs can be learnt in a few days, if, as the catalogue further says, this is combined with that 'taste and imagination which we call artistic feeling.'"

There remains the question of the legitimacy of such operations as I have described; but, though there is matter enough in it for fifty more discussions, I believe we are all agreed in the opinion which may be expressed by the old maxim, "Orthodoxy is my doxy, heterodoxy is everybody else's doxy." And certainly, when I see a bright light in the sky of a print hanging close by, produced by shading that portion of the negative with a cloth while printing, and thus preventing the paper from darkening, I am unable to understand why M. Demachy, for instance, may not produce lights in the water of *Rouen* by shading the negative, and consequently permitting the pigment on that portion of the print to remain in so soluble a condition that it may easily be dissolved away in water.

ALFRED MASKELL, F.S.A.

PHOTO-MECHANICAL NOTES.

THERE has been a surfeit of criticism of one sort or another upon the two Photographic Exhibitions, and it might be supposed that hardly anything that can be said has been left unsaid; yet it may be permissible to add another opinion, viz., from the "process man's" point of view.

One disappointing feature to me is the extreme scarcity of examples of photo-mechanical work. The Royal has, perhaps, encouraged them most, but it must be rather trying to the process exhibitors to find their productions hidden away in dark corners, as though the Hanging Committee were either unwilling or ashamed to find a place for them. The really excellent "colour" exhibits which, I consider, represent by far the greatest advances in photography and the refinement of photographic skill, were placed in a position where it was quite impossible to view them properly: and the solitary half-tone exhibit, consisting of two frames intended to pair (as representing before and after retouching), was separately hung. I saw one of them, but missed the other completely. On the other hand, the numerous photogravures were accorded a place with the "real" photographs, some of which I should be inclined to term the "common or back-garden" photographs. Are we to assume, then, by inference, that photogravure is art, whilst half-tone, heliochromy, and collotype are "t'other thing?" Any way, the misplacement of "process" at the Royal was so evident as to almost seem intentional. Has this been in deference to the eminent A.R.A. who assisted the Judges, or was it due to the artistic susceptibilities of the Hanging Committee? I cannot believe the Honorary Secretary is in any way to blame, for he has, "in another place," advocated a photo-mechanical section, whilst the Assistant Secretary has shown his sympathy with process work by introducing the feature of process reproductions in the catalogue.

However, I do not wish my remarks to be taken as written in a carping spirit; I only mention these facts as being patent to all connected with process work who visited the Exhibition, and, flagrant as the case seems, I hope this shelving of process work is not, after all, in any way intentional. May I express a hope that next year the Council will see their way to adopt Mr. Chapman Jones's suggestion of a photo-mechanical section and extend a generous invitation to process workers to contribute? If it is conceded that the Exhibition has stimulated and elevated pure photography, surely it may tend equally to the advancement of the sister art—process. Photography owes so much to photo-mechanical processes that the latter justly claim a place in the annual Exhibitions, instead of being driven to find refuge in a side gallery of an institution devoted to the exhibition of pickled tomatoes and frozen mutton, and other edible and inedible products of the empire.

Of course, I did not expect to find process represented at the Salon. It is a cut below the cult of the "new photograph." But, when we know the Salon people have principles and act up to them, we can bow in respect. Frankly, of the two shows, I must confess to being most impressed with the Salon. I do not know whether it was a better or a worse show than last year, for I had not been there before, but it certainly had a charm, even a fascination for me. There is a quiet dignity about the walls of the Salon which is totally absent at the Royal. The latter gives one a feeling of "shoppiness;" it is all so much like show-case work—very nice, very smooth, very perfect in technique—such as we can see for the most part in the shop windows in the course of a walk down the West End. This sort of thing gives one the Academy headache or the British Museum nausea. I don't profess to be any more a judge of art than the average "man in the street," but one instinctively feels at the Salon that there *is* art behind these photographs, an honest attempt to compose a picture; and, though some may fall short of their aspirations, there is still sufficient left to stamp them with individuality.

My chief interest in the pictures, after all, at both shows, was in looking upon them as "things to be reproduced," and noting how far the various reproductions realised the originals. In this light I view the principal work in the Salon with the healthy horror of the half-tone operator called upon to make a negative from a rough bromide print. I can admire the Salon exhibits as pictures, but I most piously hope I may never be called upon to reproduce their like in half-tone. Any one who has tried to make a half-tone negative from a "fuzzytype" on paper, with a grain like cocoa-matting, will cordially join me in the hope. If the Salon people are fervent in their hatred of "the process man," they could not have conspired better to defeat him and all his works than by the style of printing they for the most part favour. All reproductions of the Salon pictures I have seen are very disappointing after a view of the pictures themselves, and the same holds good of some of the best things in the Royal. But it is not the fault of the process firms who have made the blocks—there is every evidence that the work is up to the average from the technical standpoint, and in some examples reaches a high level of excellence—rather is it due to the inherent defects of the half-tone process. When we see delicate tints and

subtleties of light and shade in the original which are totally lost in the reproduction, one feels that the process, marvellously as it has advanced of late years, is still very far from perfection. Perhaps it will be said that this is just the point which justifies its exclusion from the Exhibitions, but I would rather urge that it is all the more reason why it should be encouraged, and every stimulus given to advance the quality of its results. Process workers do not intend that it shall remain as now, giving the form without the colour of the original, and only tolerated because of its faithfulness—in this respect fulfilling a place which no hand engraving has ever attained.

How it can be bettered is hard to say in the light of present knowledge, but, that it will eventually come as near to the processes of pure photography as collotype and photogravure do to-day, I firmly believe. It ought not to fall so far short of them as it does now, if we reason the matter out theoretically, but why it does so it is hard to say, chiefly because there are so many things to take into account. One reason I think is that we have striven too much after that technical perfection of dot rendering, which gives a negative that "any boy can print," and "any fool can etch," as the saying goes. I fancy that, if we ceased to expect all negatives to print alike, no matter what the character of the original, and devoted the same care to printing as is given to the handling of sensitised paper, there would be less of the dead level of flatness which prevails in the half-tone work of to-day.

WILLIAM GAMBLE.

REMARKS UPON ORTHOCHROMATIC PHOTOGRAPHY AND THE METHODS OF SPECTROGRAPHIC TEST.

IN No. 421 of the *Photographische Correspondenz*, 1895,* page 494, there is an article by Fred. E. Ives "Upon Orthochromatic Photography with Ordinary Plates," which gives some noteworthy hints about colour filters and the use of chrysoidine and naphthol yellow, which agree with my own experience. Ives, however, in this article sets out several generally accepted principles which enter into the domain of spectrum photography, and with reference to these I cannot agree with him, and I consider it necessary to make them clear. Ives constructed a photo-spectrograph containing a train of light crown-glass prisms, and made experiments with different sorts of plates, and arrived at several conclusions, which I now desire to discuss.

Ives says "that the relative amount of action by the dark violet and ultra-violet rays in ordinary photography is far greater than has been generally supposed." This expression, "than has been generally supposed," must convey a subjective opinion, in uttering which Ives must clearly have had the American public in view. But this does not apply to us, for we have repeatedly described the action of the coloured rays and made photographs of them, and directed attention to the enormous relative action of the more refrangible rays, which can only be greatly reduced by the employment of certain sorts of glass. The relative photographic action of the violet and ultra-violet is at least generally known in German literature by the comparative experiments with glass and quartz spectrographs which have appeared in the photographic press (*vide* Eder and Valenta's treatises, *Photographische Correspondenz*, 1894, p. 386).

Moreover, Mr. Ives could not make his spectrographic researches agree with his photographic results, and concludes that "spectrographic tests, *as ordinarily conducted*, are not competent to discover their true photographic value." To this opinion I offer no objection, provided it is thereby understood that spectrographic tests are generally made in a very superficial manner, in which case, of course, they are not competent. If, however, the spectrographic work is done correctly, the conclusions drawn therefrom respecting colour-sensitiveness, &c., are fully competent.

Above all, it is necessary in spectrographic work to take into consideration the construction of the spectrograph (glass, quartz, grating), it will then be possible to make correct use of the experimental results according to the nature of the spectrograph.

One must take care not to accept as universally valid the opinion of Mr. Ives "that crown-glass prisms do not indicate anywhere near the true photographic value of the more refrangible rays." Crown-glass prisms indicate much more correctly the true photographic value of the more refrangible rays, *of course with reference to absorption by this kind of glass.* If this condition must be avoided, the spectroscopist should use quartz, or concave gratings, to work with, which are, of course, more difficult. The photo-chemist must really take into account the conditions of the optical instruments in relation to absorption, in order to arrive at correct conclusions; by disregarding the surroundings, the best spectrograph, of course, will yield false results.

With correct working methods and correct analysis of the results of the experiments, it will also be found that it is no longer extraordinary that direct-vision spectroscopes "show no action whatever in the ultra-violet," for it has been long known that the thick masses of glass of such prisms totally displace the curve of colour-sensitiveness, and must necessarily do so, since the absorption of the short-waved rays is very great; we have also pointed out that Jena glasses act very differently in this respect, and that one must also be careful with these not to formulate propositions, and apply them generally upon basis of a single observation.

In addition to this, photographic lenses differ from one another in transmission of colour at the violet end of the spectrum; for instance, the triple cemented double anastigmats absorb much more violet and ultra-violet than the thin single or double-cemented lenses of more transparent material.

In spectroscopic work and conclusions therefrom in orthochromatic photography, we must not only consider the nature of the optical apparatus, but also, on one hand, the distribution of colour brightness in the solar spectrum, and on the other hand the coloured natural object to be photographed, which sends reflected light into the apparatus.

In the direct solar spectrum the brightness of the red and yellow rays seems to be distributed quite different from the blue when examined in comparison with the reflected light of a street picture; it is therefore not at all surprising that Mr. Ives, for example, should appear to get "forty per cent. of the total amount of action at the red end" in the spectrum photograph through a chrysoidine filter, yet in taking a "street view" he should have to expose eight times as long with naphthol yellow. These phenomena in spectroscopy are easily explained from the before-mentioned standpoint, and all these apparent contradictions are solved by the correct application and interpretation of spectrum photography.

In this article Mr. Ives also discusses the question, If ordinary plates can be of the same use as orthochromatic when used with colour screens? This question has long ago been decided in favour of orthochromatic plates by countless experiments; what photographer or physist doubts to-day the use of orthochromatic plates? Instances may, however, occur in which the ordinary plate can give a truer tone value for colour than the orthochromatic plate. It is known that these cases occur now and then in photographic practice, and that such exceptional cases exist is demonstrated every year, for example, to the scholars of the Imperial Institute for Photographic Instruction and Research.

Such cases present themselves now and then in photographing high-coloured pictures, Persian carpets, &c., in which occur red, green, and blue of approximately the same value for optical brightness, but which, in consequence of their different colours, show strong contrast. If such things are reproduced in perfectly correct orthochromatic values according to their brightness, the tones in the copy must of necessity blend and show little or no contrast. One must then employ either plates of stronger orthochromatic sensitiveness, or a deeper yellow screen, to give prominence to the red at the expense of the blue, or one must follow the opposite course, and use lighter screens and plates of little or no orthochromatic value. The drawing of the coloured objects then becomes clearly pronounced. These apparent anomalies are not, however, *de facto* opposed to theory.

Further, the long-known fact must not be forgotten that ordinary gelatino-bromide plates, though of maximum sensitiveness to blue and violet, are markedly sensitive to green and yellow, and even somewhat to red, which spectrum photography has also proved. If, then, Ives has used this very low sensitiveness to red, yellow, and green in photographing coloured objects with very long exposure, very bright light, and coloured screens, he may, no doubt, have produced a negative under favourable conditions. The red and yellow pigments may act but little (so far as they are not sensitive to blue-green): but it may happen that a reduction of strong photographic contrast is desirable, for such cases can help the character of the reproduction, as already mentioned. If, however, plates are used in which these traces of sensitiveness to red, yellow, and green are wanting, as, for instance, in wet plates with iodide of silver, the absence of a colour-sensitiser is felt very much, and it is impossible to secure a colour-correct picture, even with a yellow screen as colour filter, if the experiment is correctly carried out. If, however, colour filters are selected which will not cut off all the blue and blue-green, such rays must naturally pass into the camera and invalidate the result.

Strong photographic action of red, yellow, and green can only be attained when the plate is sensitised for these rays by suitable dyes,

* See also THE BRITISH JOURNAL OF PHOTOGRAPHY, August 16, 1895, p. 517.

whether colour filters be used or not, or, in common parlance, by use of orthochromatic plates.

The enormous value of orthochromatic procedure is so well known to firms that make reproduction their business, and the copying of pictures and the publication of works of art a speciality, that it is carrying coal to Newcastle to emphasise it. On the other hand, it is equally indubitable that modern orthochromatic photography, in theory as well as in practice, has been placed on a scientific basis by the help of spectro-photography. The production of a spectrum photograph is not difficult, but it is far more difficult to interpret the results correctly, and to set out the connexion of the conditions of the experiment with reference to variable absorption of light of the photographic apparatus, the spectral composition of the transmitted and reflected light, the colour filters, and the sensitiveness of the orthochromatic plates. Such questions demand thorough physical comparison of the kind we have mentioned, and, if the spectrograph appears in apparent contradiction with the photographic copy of a chromo-lithograph, it must not be said that the apparatus is unreliable in itself, but that the results of the experiment have been badly interpreted.

The spectrograph remains now, as in the past, the most indispensable analyser of all colour phenomena; without its application to known ends, it is impossible to think of more thorough penetration into the domain of colour and photo-chemical facts.

DR. J. M. EDER.

Our Editorial Table.

THE "UNIQUE" SERIES OF CHRISTMAS CARDS.

Hills & Co., 108-109, Fore-street, E.C.

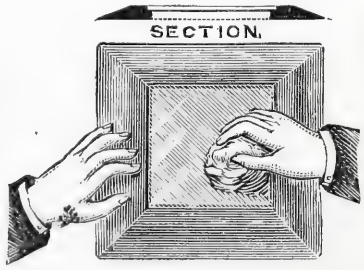
IT is remarkable to note the growth in popularity of the collotype process for Christmas cards. The specimens done by this method that have been sent us by Messrs. Hills & Co. are excellent examples of this style of printing, and, allied with tastefully chosen mounts, form pretty and attractive reminders of the festive season, far in advance, æsthetically, of the old form of coloured Christmas and New-year's cards. Well-chosen little views and figure studies comprise the subjects. Photographers should certainly find a good sale for such productions, which Messrs. Hills also inform us are not only published in England, but are also designed and manufactured by English hands here.

MESSRS. HILLS have also submitted to us a small album of photogravures reproduced from several of Mr. Horsley Hinton's well-known landscapes. This forms an attractive series, although here and there, whether it be from the printing or other cause, the clouds are certainly somewhat too heavily rendered.

THE "PRIMUS" GLASS-CLEANING APPARATUS.

W. Butcher & Son, Blackheath.

THIS is a neat frame made in ash, and mitred and tongued together at the corners; the glass is laid in the rebate of same and is cleaned one side, then reversed and cleaned the other side. The glass can be



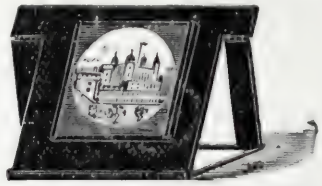
handled by the edges throughout, thus avoiding any finger-marks, &c. All photographers who clean glass for wet-plate work, lantern work, and other uses, will appreciate this simple addition to their resources.

THE "PRIMUS" TRANSPARENCY EASEL.

W. Butcher & Son, Blackheath.

THIS is a handy little device for enabling lantern slides to be viewed on the table.

It is made in tin, japanned dark green and lined in gold. When set up it forms a rigid desk or easel; the bottom falls down and



forms a catch for the back legs, holding them quite firm, and being painted white inside acts as a reflector, illuminating the slide. It will be found useful for working up and painting or spotting lantern slides, and can also be used for exhibiting slides in all sorts of positions.

A FLASHLIGHT PHOTOGRAPH.

The London Stereoscopic Company, 54, Cheapside.

THE London Stereoscopic Company, of 54, Cheapside, have submitted to us a print from a 20×16 negative taken by Mr. E. Milner, of their firm, of a very numerously attended festivity recently held in the King's Hall, Holborn Restaurant. The exposure was made by flashlight, three seconds being given to two ounces of magnesium distributed among six lamps. The lens employed was a 12-inch Goerz, and it has done its work well, the covering and definition being capital, while, taken as a whole, the result is a very creditable specimen of flashlight photography.

SPECIMENS OF PHOTOGRAPHY.

By JOHN WICKENS.

MR. JOHN WICKENS, of Upper Bangor, North Wales, sent three photographs to the Royal Photographic Society's Exhibition, but they arrived just a day too late, and the stern and inexorable regulations of the Society forbade their acceptance for exhibition. The photographs have been sent on to us for our inspection and opinion. They comprise a wintry study of leafless trees and a snowy foreground, with the bent figure of an old man; a capital portrait of a fresh and jovial-looking young fisherman, *After the Storm;* and a prettily rendered picture, technically and artistically good, of a little child just leaving her bed, that would make the fortune of a Christmas annual if issued as a coloured supplement. Mr. Wickens' work is distinctly meritorious, and we are confident of meeting it at future exhibitions, for which we hope he will always be in time.

THE PRESTO PAPER.

Otto Scholzig, 31, Binfield-road, Clapham.

THE properties of the Presto paper, which fit it for rapid contact printing in dull weather or artificial light, and solar or limelight enlarging, are those that appeal just now to professional men with orders demanding execution and little or no light wherewith to print them. As showing the capabilities of this paper for giving good results with short exposures to artificial light, and subsequent development and toning, Mr. Scholzig has sent us a print in four sections, which had eight, six, four, and two minutes' exposure respectively to the incandescent gaslight, and which effectively illustrates over, under, and correct exposure. A finished print of the same subject leaves nothing to be desired in the way of detail and good quality, a remark which also applies to an enlargement sent. We give the complete instructions for the paper, with which we have made a few satisfactory trials:—

"CONTACT PRINTING.

"Expose under the negative, in very weak daylight, some distance away from the window, or artificial light, until the very faintest trace of the image is visible on examining the print under weak gas or candle light.

"Printing in strong daylight, except with negatives of extraordinary density, means inevitable fogging of the high lights of the print, no matter how short the exposure, so, when printing in daylight, the light must be reduced so as to allow (with a negative of average density) of an exposure of three minutes' duration without over-exposure. To find the proper strength, or rather weakness, of the light, expose a very small piece of Presto paper half covered up some distance from the window, in the exact place where the printing is to be done. If the exposed half of the paper shows distinct discolouration in less than thirty seconds, the light is too strong for an average negative, and the printing must be done further away from the window, or the window must be shaded. With the light-

properly reduced, even the thinnest negative will give a better print than by any other process.

"By artificial light, the proper exposures for an average negative are as follows:—

9 inches from a medium fishtail gas burner .. 15 mins.
9 inches from an incandescent gaslight ..... 5 „

thin negatives, less; dense negatives, proportionately longer. By judicious manipulation of both strength of light and time of exposure, the Presto paper will give a good print from the densest as well as from the thinnest negative.

"The tone depends entirely on the length of exposure. Short exposure gives cold, long exposure warm tones. With a constant light and measured exposure, any number of prints from the same negative, of absolutely even tone and density, can be obtained on Presto paper. With a little practice in judging the strength of light and time of exposure best suited to each negative, prints of unsurpassed beauty will easily be obtained by any worker."

The following is the method of development recommended:—

"DEVELOPING.

Stock Solution.

Eikonogen	60 grains.
Soda sulphite (pure)	240 „
Potassium carbonate (pure)	120 „
Ten per cent. bromide of potassium solution	30 minims.
Distilled water	5 ounces.

For use, mix—

Stock solution	4 drachms.
Water	10 ounces.
Ten per cent. bromide of potassium	15 minims.

"Put the prints in the developer, without washing, by weak gaslight, and keep turning them over and over (not simply rock the dish, which is quite insufficient to secure even development). The image, if properly exposed, will come up a reddish colour in about three to four minutes.

"When prints have nearly reached the desired depth, the gas can be turned on full (which will not injure the prints at that stage), and the final development can thus be closely watched.

"A Presto print does not reduce in the subsequent toning, and it is therefore necessary to stop development at exactly the desired depth of the finished picture, bearing in mind that only a vigorous image can form a good basis for toning.

"For every whole-plate print, or its equivalent, that has been developed, one drachm of stock solution should be added, to keep up normal strength. Make up fresh developer when the old one is discoloured.

"FIXING AND TONING.

Hypo Bath.

Hyposulphite of soda	4 ounces.
Water	1 pint.

"After development has been carried to the desired depth, immerse the prints quickly in the above hypo bath, which will stop the action of the developer, and keep them there in motion.

Five minutes for the

Combined Toning and Fixing Bath.

Water	16 ounces.
Hyposulphite of soda	2½ „
Dissolve and add—	
Sulphocyanide of ammonium	2 drachms.
Dissolve and add—	
Chloride of gold	5 grains.

Mix well; give twelve hours for maturing and filter.

"The prints only want a rinse between the hypo bath and the combined bath.

Or ten minutes for the

Separate Toning Bath.

Sulphocyanide of ammonium	1 drachm.
Chloride of gold	3 grains.
Water	16 ounces.

"Before putting the prints into the separate toning bath, they must have fifteen minutes of thorough washing.

"The best way to judge time of exposure for enlargements is to make a pinhole in the film of the negative in a place which does not spoil the print (pinholes greatly assist sharp focussing during dull daylight).

"Prolong exposure until an impression of the pinhole is visible on the paper when examined by candle light.

"The approximate exposure to good, direct, bright north light, with *f*-8 lens, and enlarging an average negative to two and a half diameters, is twenty-five to thirty minutes. Developing, fixing, and toning of enlargements are done exactly the same as with contact prints. To secure even immersion, soak the enlargement in water till limp before putting in the developer."

News and Notes.

ROYAL PHOTOGRAPHIC SOCIETY.—Photo-mechanical Meeting. Tuesday, December 17, at eight p.m., at 12, Hanover-square. *Notes on Three-colour Printing*, by Mr. E. J. Wall, including a note on the printing ink by Mr. C. G. Zander.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—On Monday, December 16, this Society will hold its Annual Bohemian Concert at the Hanover Hall, Hanover-park, Peckham, at eight p.m., when all members and their friends are cordially invited to be present.

MANCHESTER AMATEUR PHOTOGRAPHIC SOCIETY.—The Tenth Annual Photographic Exhibition will be held at the Manchester Athenæum (George-street entrance), on Tuesday, Wednesday, Thursday, Friday, and Saturday, December 17, 18, 19, 20, and 21, 1895. Open Tuesday, 6 to 10 p.m.; following days, noon to 10 p.m.

THE LONDON COUNTY COUNCIL AND THE PHOTOGRAPHING OF THE LONDON BRIDGES.—The recommendation of the Bridges Committee of the London County Council relating to the photographing of the bridges under the Council's control, and referred to in THE BRITISH JOURNAL OF PHOTOGRAPHY of November 30 last, has since been discussed by the Council on two occasions, and was ultimately withdrawn. The matter has, therefore, dropped—for the present, at any rate.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, December 18. Lantern Night. Mr. H. G. Malby will read a paper, illustrated with about 100 slides from his own negatives, entitled *Rambles in Epping Forest*. Visitors will be welcomed by the members. As the following Wednesday will fall upon Christmas Day, the usual meeting will not be held.

ROYAL INSTITUTION.—The following are the lecture arrangements before Easter:—Professor John Gray McKendrick (Professor of Physiology in the University of Glasgow), six lectures, adapted to a juvenile auditory, on *Sound, Hearing, and Speech*, experimentally illustrated; Professor Charles Stewart (Fullerian Professor of Physiology, R.I.), eleven lectures on *The External Covering of Plants and Animals: its Structure and Functions;* the Rev. Philip H. Wicksteed, four lectures on *Dante;* Professor H. Marshall Ward (Professor of Botany in the University of Cambridge), three lectures on *Some Aspects of Modern Botany;* the Rev. William Barry, D.D., four lectures, *Masters of Modern Thought*—Voltaire, Rousseau, Goethe, and Spinoza; Professor C. Hubert H. Parry (Professor of Musical History and Composition at the Royal College of Music), three lectures on *Realism and Idealism in Musical Art*, with musical illustrations; the Right Hon. Lord Rayleigh (Professor of Natural Philosophy, R.I.), six lectures on *Light*. The Friday evening meetings will begin on January 17, when a discourse will be given by the Right Hon. Lord Rayleigh, on *More about Argon*. Succeeding discourses will probably be given by Professor Burdon Sanderson, Mr. W. S. Lilly, Dr. John Murray, Mr. J. J. Armistead, Dr. Edward Frankland, Mr. A. R. Binnie, Mr. Sidney Lee, Professor T. R. Frazer, Professor Dewar, and other gentlemen.

A FINE-ART Competition and Exhibition will shortly be held at the Galleries of the Royal Institute of Painters in Water Colours, Piccadilly. 500*l.* in prizes will be given by Messrs. C. W. Faulkner & Co., of 41, Jewin-street, London, E.C., who will also be open to purchase designs, pictures, &c., to the value of a further sum of 500*l.*, making a total of 1000*l.*, in prizes and purchases. The following members of the Royal Academy have kindly consented to act as Judges: Messrs. Philip H. Calderon, R.A., Luke Fildes, R.A., Andrew C. Gow, R.A. All works intended for this Competition must be delivered at the above Galleries on Thursday, January 23, or Friday, January 24, 1896, free of any expense or charge, between the hours of nine a.m. and nine p.m., and no pictures or designs can in any case be received before or after those dates. Works cannot be received packed in cases or by parcels post. The 500*l.* in prizes will be awarded for pictures and designs as follows:—Section I. Pictures suitable for reproduction as presentation plates, frontispieces, for framing, and to serve as studies for painting. Section II. Pictures and designs suitable for showcards, calendars, almanacs, and advertising novelties. Section III. Pictures and designs suitable for Christmas and other cards. As to these three classes the prizes will be as follows: First prize, 100*l.*; second prize, 50*l.*; third prize, 40*l.*; fourth prize, 30*l.*; fifth prize, 25*l.*; ten prizes of 20*l.* each, 200*l.* In addition, prizes will also be given for Section IV. Photographic designs and pictures for reproduction for purposes similar to the foregoing, and will be divided between the Sections as follows: First prize, 20*l.*; second prize, 10*l.*; five prizes of 5*l.* each, 25*l.* The Judges for the Photographic Section are Lieut.-Colonel J. Gale, Mr. Valentine Blanchard, and Mr. Bernard Alfieri. All particulars may be had of Messrs. Faulkner at the address given.

COLOUR PHOTOGRAPHY LITIGATION.—We hear that some legal proceedings are pending in regard to patents for the three-colour process and the outcome

will be interesting. Briefly the circumstances are these: In 1891-2, Dr. Albert, of Munich, took out an English patent (No. 6634), in which he made the following principal claims: First, multicolour printing from printing surfaces drawn by means of a series of parallel lines, crossed in such a manner that the direction of the lines for each colour varies by an angle of about thirty degrees. Second, multicolour printing from colour blocks, plates, stones, or other printing surfaces, produced by photography by means of screens or tints turned so that the direction of the lines forming the tint for each colour varies by an angle of either about thirty degress, or about sixty degrees. The patentee claims these to be "improvements in the methods of producing two or more coloured prints." The date of application for the patent is April 17, 1891. Apparently Dr. Albert has disposed of his patent rights to an English firm, who are now proceeding to take action against an eminent firm of letterpress printers for printing certain blocks, which, it is alleged, infringe these patents. The singular part of the matter is that no action is being taken against the makers of the blocks, and we believe it is the intention to proceed against any printer who attempts to work blocks in this way. The proceedings, however, appear to be a particularly insidious method of stopping the production of the most successful form of three-colour blocks. It is hardly likely, however, that printers, on the one hand, or the makers of colour blocks on the other, will tamely submit to such a sweeping prohibition, especially as it is open to question whether the patent has been infringed, and whether, after all, it possesses any validity. Any way, it is a matter of life and death to a well-known firm engaged in the making of three-colour blocks, and we understand the patent will be contested.—*Process Work.*

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK

December.	Name of Society.	Subject.
16	Camera Club	
16	Glasgow and West of Scotland	
16	Leeds Photo. Society	*New Lantern Slides.* Godfrey Bingley.
16	North Middlesex	
16	Richmond	*Frame making and Photographic Carpentry.* L. Taylor.
16	South London	
7	Birmingham Photo. Society	
17	Brixton and Clapham	*Printing Processes of To-day.*—III. Carbon. C. F. Archer.
17	Derby	
17	Exeter	
17	Gospel Oak	*History and Properties of Photographic Lenses.* W. Beyer.
17	Hackney	
17	Hastings and St. Leonards	
17	Keighley and District	
17	North London	
17	Paisley	
17	Rochester	
17	Royal Photographic Society	*Notes on Three-colour Printing.* E. J. Wall. Including a Note on the Printing Inks. C. G. Zander.
18	Brechin	
18	Bury	
18	Croydon Camera Club	Selection of Prints for Club Album.
18	Darwen	*Light in Harness.* H. W. Bretherick.
18	Levtonstone	
18	Manchester Camera Club	
18	Oldham	Annual Dinner.
18	Photographic Club	*Rambles in Epping Forest.* H. G. Maltby.
18	Southport	
18	Southsea	
19	Birmingham Photo. Society	
19	Bradford	Members' Quarterly Competition.
19	Camera Club	
19	Glossop Dale	
19	Greenock	
19	Hull	
19	Leeds Camera Club	Smoking Concert and Presentation of Prizes.
19	Leigh	*Mounts and Mountants.* T. Peters.
19	Liverpool Amateur	Demonstration on Lantern-slide Making. G. A. Carruthers.
19	London and Provincial	*On the Tele-photo Lens*, with Lantern Illustrations of its Use. R. B. Lodge.
19	Oldham	*Reminiscences of Killarney and District.* J. Brooks
19	Putney	
20	Birkenhead Photo. Asso.	*Developers.* Mr. Whetton.
20	Cardiff	
20	Croydon Microscopical	Conversational Meeting.
20	Holborn	
20	Leamington	
20	Lewisham	Exhibition of Members' Work taken during the Year.
20	Maidstone	
20	North Kent	
21	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

DECEMBER 10, Ordinary Meeting, Sir H. Trueman Wood, M.A. (President), in the chair.

Thirteen applications for membership were read, and twelve new members were elected.

The PRESIDENT said he had been invited to take the chair at a meeting to be held at Anderton's Hotel, Fleet-street, on Friday evening, December 20, to consider the question of establishing a memorial of the late Mr. J. Traill Taylor. He had had much pleasure in accepting the invitation, and hoped that a large number of photographers would attend. He suggested that it would be a graceful and kindly act to offer the use of the Society's rooms for meetings of any committee which might be appointed to carry out the object referred to, and the suggestion was readily accepted.

Messrs. Snowden Ward and E. W. Parfitt were elected Auditors of the Society's accounts for the current year.

The PRESIDENT announced that a paper which was announced to be read by Professor Roberts-Austen, C.B., was of necessity postponed until some future meeting, and he therefore called upon

Mr. CHAPMAN JONES, F.I.C., F.C.S. (Hon. Secretary), to read his paper on *A New Form of Apparatus for Measuring the Densities of Photographic Plates.* Mr. Jones said he had set himself (1) to get rid of the need for two lights and the consequent necessity of keeping them constantly proportional to each other; (2) to arrange that the readings should be obtained by one simple movement, avoiding the need for the sector arrangement and motor, or their equivalent, as used by Captain Abney, and (3) to avoid the possibility of the scattering, and consequent partial loss, of any of the light that had passed the plate being tested. He exhibited the apparatus which he had designed, one light only being necessary, shining directly upon one side of the test plate, and a beam being brought to the other side by means of three mirrors and a velvet-lined tube with diaphragms. The test plate was Captain Abney's arrangement of a translucent and opaque white surface in juxtaposition, the one being illuminated by transmitted light, and the other by light impinging upon it from the front. When both were equally bright, the test plate was at zero point; then the photographic plate to be measured was brought immediately behind the translucent portion, and the arrangement moved until the equality of brightness was restored, when the density of the interposed deposit was shown on a scale marked on the bed of the apparatus. He used an incandescent gas burner, but any circular flame that could be brought into position would answer the purpose. The paper detailed the method of calculating the scale, by means of which errors in reading would range from nothing up to five per cent., when only one per cent. of the light was transmitted. The three mirrors were of thin, silvered, patent plate, as ordinary silvered plate, being thicker, would spread the light more by reflection from the front surface, and was therefore distinctly less advantageous. The test plate was of a more permanent character than that employed by Captain Abney, opal glass, of from ·2 to ·4 mm. in thickness, being used instead of paper. The scale on the instrument extended down to an opacity transmitting one per cent. of light, or an opacity logarithm of 2·00; but the reflected beam might be reduced in intensity by the use of a plate having a horizontal slit, and the scale then gave results from log. 1·725 to log. 3·725, or the transparency per cent. from 1·9 to ·019. Comparative tables were exhibited, showing readings with Mr. Chapman Jones's instrument, and by Captain Abney's and Messrs. Hurter & Driffield's methods. In the former case the figures obtained were very close; but, in the latter, there was a marked discrepancy, which Mr. Jones surmised was due to the loss of light by scattering in the method of Messrs. Hurter & Driffield. He had found that certain modifications of the apparatus were desirable; and, although its adaptation to the estimation of the blackness of deposits on paper or opaque supports did not appear to be either easy or convenient, he had made a few preliminary experiments with a somewhat similar, though simpler, arrangement, and, if it fulfilled his expectations, he hoped to bring it before the Society on a future occasion.

Mr. SNOWDEN WARD showed a modification of Mr. Lovibond's tintometer, devised for the purpose of measuring the colour reading, as well as the density, of plates for printing purposes. He also showed, on the blackboard, tables showing readings of strips of a dry plate developed with Messrs. Hurter & Driffield's standard developer and with pyro, the figures giving the readings by Messrs. Hurter & Driffield's method, and also the colour reading by the tintometer.

Captain ABNEY was particularly pleased with Mr. Chapman Jones's apparatus, as it adopted the screen which he had always thought to be the best, as it measured the printing density of the plate. He showed, by means of a diagram, another method of measuring density, by means of a wedge of black glass, which he had described at the Royal Astronomical Society. There was a great disadvantage, however, attending the use of neutral-tint glasses, in that they were not black—there was always some colour present, and it was therefore necessary to exercise great care before making final measurements. He was much struck with the fact that Mr. Jones had done away with the use of sectors, and had produced a handy and compact instrument, which did not require an electro-motor to work it; he had himself made a similar one, except that he used two lights, and the screen would take a half-plate negative, and it worked very satisfactorily indeed. He thought Mr. Jones's system was better than the sector method for high densities, while sectors were more advantageous for faint opacities.

Mr. J. CADETT did not see how Mr. Jones could expect his readings to be quite correct in the highest densities in approaching so large a flame. He thought that, in getting close to the light, the law of inverse squares would be somewhat interfered with. He was pleased to see that the question of measuring densities was of more general interest. The day would, no doubt, come when every photographer would have a simple instrument, by means of which he could test his plates and determine their speed. The question of speed was a very vexed one, and at the present time no single plate-manufacturer had agreed to work on definitely formulated lines, and he hoped that the Committee appointed by the Society upon the subject would be able to exert some influence in the matter.

Mr. STERRY having made a few remarks,

The PRESIDENT moved a vote of thanks to Mr. Chapman Jones for his communication, and, the same having been carried,

Mr. CHAPMAN JONES briefly replied. Referring to Captain Abney's statement that sectors were preferable for low densities, he said that, although he had not worked with the latter, he thought that for all practical purposes the method he had described might be relied upon for all densities. He did not see why, as Mr. Cadett suggested, the law of inverse square should be interfered with; at the same time, however, it was difficult to know what one was

doing when the light was approached too closely, and therefore he did not go too near the light, but employed the slit plate to which he had referred in the paper. His instrument had nothing whatever to do with plate speeds; a plate had no speed until the method of its use was determined.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 5,—Mr. E. J. Wall in the chair.

The HON. SECRETARY showed a cabinet photograph of the late Mr. Traill Taylor, which he had received from Mr. G. Watmough Webster, of Chester, and reported what had been done in the matter of securing a suitable print for the Association. In the course of a chat on the properties of various new lenses, he said the Cooke lens would do everything for the size of plate for which it is advertised, but, beyond this, definition was lost.

The CHAIRMAN referred to some tests by a firm of process workers of all the new lenses, using a specially printed sheet of the *Daily Chronicle*. They had found that the Satz anastigmat of Zeiss showed up best. His experience of the new Cooke lens differed from that of Mr. Bayston, who favoured the Goerz.

The HON. SECRETARY had obtained a catalogue of Steinheil's, describing their orthostigmat, the construction of which, juding from the combinations, appeared to him to be almost a counterpart of the Goerz. It also gave particulars of two sets of lenses, which gave six different foci at will.

The CHAIRMAN said that Messrs. Turner & Wright, of America, had issued a new lens, which they called anastigmat, composed of five and six elements in each combination; also that one had been issued by Messrs. Clement & Gilmer, of Paris. He proposed that at an early date in the new year an evening be set apart for the purpose of testing lenses, and, in connexion with the provision of a universal flange for holding the same, mentioned one by Watson & Sons, consisting of a brass ring in which the lens is gripped by three points engaging the threads of the screw. In connexion with the question of how to sensitise plates for deep red, brought to his notice by the minutes, if pure spectrum red be meant, cyanine sensitises to C in the spectrum. A far better dye than that, however, in his opinion, was cæruleine bisulphite, suggested by Higgs in the *Chemical News* in 1891, which sensitises right through from about C to beyond A in the red. Another very good salt was one of the new rhodamines, with which he had photographed A, B, and C of the spectrum absolutely sharp, using a very deep screen so as to shut out everything beyond the yellow, developing in dim green light. When you come to reproducing red brown, which was composed of red, yellow, and blue, however, it was a question as to how far you want to reproduce it as a light colour.

The HON. SECRETARY referred to an article by Vogel in the *Jahrbuch*, in which he tries to account for a peculiarity that he had noticed in using various sized stops. He found that, in using a larger stop, he required much more than the proportionate exposure. He accounted for it by the difference in thickness existing between the centre and edges of the lenses. He (the Hon. Secretary) believed that it was a defect with most triplets that flare spots were prevalent, and asked if they had been noticed in the Cooke lens, to which

The CHAIRMAN answered that he had not seen any trace.

A letter from Mr. A. Mackie was read, announcing a meeting to be held at Anderton's Hotel on Friday, the 20th inst., to discuss the question of a memorial to the late Mr. Traill Taylor, and it was resolved that the Hon. Secretary and Mr. Haddon represent the Association on that occasion.

Mr. T. E. FRESHWATER had recently to photograph a human brain, which he found difficult to manage, but had got over the difficulty by an arrangement by which the camera was pointed downwards, similar in theory to the Hepworth vertical stand, but somewhat simpler.

Referring to three-colour work, the HON. SECRETARY asked how a pale blue could be obtained. Would the separation of the dots be sufficient to produce the pale tints?

The CHAIRMAN answered that there was no difficulty whatever in so doing with any colour. The screen cuts out in all gradations, and the distance of the dots would alone secure the lighter tints, just as in ordinary black-and-white half-tone blocks. He promised to bring before the Association specimens of the printing of half-tones by the Chemigraph process.

The HON. SECRETARY had taken two lenses of the same type by different makers, and inquired how it was that the reflected images were more numerous in some than in others, but no explanation was forthcoming.

PHOTOGRAPHIC CLUB.

THE usual weekly meeting was held at the Club-rooms, Anderton's Hotel, in Fleet-street, London, on Wednesday, December 4, Mr. W. D. Welford in the chair.

Upwards of forty members were present.

Two candidates for membership were elected, making an addition of ten to the subscribers to the Club since November 1.

Mr. ETHELBERT HENRY, C.E, then proceeded to demonstrate his powder process of ceramic photography. He prefaced his remarks by comparing the two practicable methods, viz., the powder process and the substitution one. Facts, he said, were all in favour of the former. As the results showed his manipulations to be successful, and the method appeared simple, the statement seemed correct. The results were really permanent, and depend upon the underlying principle of the adherence of coloured dust to a gummy substance possessing the potentiality of light selectiveness. After describing the older methods—which he had abandoned in favour of his own modifications—Mr. Henry said he recommended the use of fish glue (Lepage's), combined with some hygroscopic substance, to give a sufficiently sticky surface, and bichromate of ammonium to impart the necessary sensitiveness to light. His exact formula was—

Organic Solution.

Fish glue	1 part.
Glucose	4 parts.
Water	10 ,,

Sensitising Solution.

Bichromate of ammonium	1 part.
Water	10 parts.

These solutions *keep* in separate bulks and are to be mixed in equal proportions for use. It is necessary to filter out all mechanical impurities through cotton-wool. The film of sensitive organic solution—which is preferably coated upon an ordinary glass plate, which need not be chemically clean—has to be printed under a transparency. The reason of this is because the film loses its stickiness *where the light acts*. Mr. Henry used an ordinary gelatino-bromide transparency, which, however, was printed a little deeper than would have been the best for an optical lantern slide. A thick film of organifier is not necessary to secure the adherence of a sufficiency of the dusting-on powder, but the film must be of even thickness, and must be coated in a room free from floating dust particles. This is best secured by spraying a small chamber with a water vapouriser, such a one as is employed for diffusing scent, or the barber's bay rum. The diffused watery particles carry down the air dust, and in about an hour the room is ready for use for this special purpose. The glass plate must be "warm" when the sensitised organifier is poured on it, and, after this has been drained off in the familiar photographic manner, the plate must be dried by gentle heat. Too little heat will give a film with insufficient stickiness; too great heat will lead to failure in stripping the dusted-on image. As soon as the plate is dry (it is dried over a spirit lamp or Bunsen flame), it is ready to be printed from the prepared transparency, which must be warmed before the warm sensitive film is placed in contact with it. A visible image is produced, which must be dusted over with a suitable colour—of which there are several—the organic film being again warmed before this operation takes place. If the printed plate be not warmed, it will "take" the powder too freely. The dusting-on operation must be performed with a light hand and a piece of dry cotton wool, with the loose ceramic powder upon it, in point of fact, in the manner that a powder-puff is used. When the image is sufficiently impregnated with powder, the superfluous dust must be wiped off with a clean "puff of wool," and the film coated with Mawson's enamel collodion, diluted with an equal bulk of methylated sulphuric ether. So soon as this is "set," it is placed in a dish of clean cold water, to which is added exactly four per cent. of pure sulphuric acid. This dissolves the fish glue. The film of collodion, which now holds all the powder image, is set free from the glass plate which supported it, and the picture is ready, after the weak acid is washed away from it, to be placed in a "fused borax" bath. This, which serves as a partial flux, is composed of a half-saturated solution of fused borax (not ordinary sodium biborate). The collodion image is now placed upon the enamelled copper plaque, which is to be its final resting-place, and great care must be taken that the collodion side is in contact with the plaque, and not *vice versâ*, or failure in firing, as well as reversal of the image, will take place. As soon as the film is in position (this must be effected under water, in which the film will move freely, and without undue risk of damage), it must be allowed to become surface-dry, and must then be placed in the muffle furnace, which should be heated to a bright cherry-red.

Mr. Henry used a Fletcher's gas muffler, which is large enough, at a cost of 50*s*., to burn a 3×5 plaque. The plaques, enammelled on copper, can, with all the necessary apparatus, be obtained from Messrs. Penrose & Co., of Upper Baker-street, Clerkenwell.

Mr. Henry, who is a tall fair man, with an agreeable manner and lucid delivery, proceeded to burn in and bring to a successful issue his very practical demonstration.

Many pertinent questions were asked by the members and answered by Mr. Henry, but the matter of them has been incorporated in the foregoing account, which, however, is too brief and incomplete to render justice to the demonstration.

After the demonstration, Mr. CHILD BAYLEY asked whether the Committee intended to devote an evening to a Ladies' Night, as heretofore, and was informed by the Secretary that such was the intention, and that the second Wednesday in January would probably be the date of the meeting.

Croydon Microscopical and Natural History Club (Photographic Section).—This Society held its twenty-sixth annual *Soirée* at the Public Hall, Croydon, on Wednesday, November 27, when there was an attendance of 515 members and their friends. The entire building was secured for the occasion, and the exhibits were both numerous and interesting. The stage, whereon was the orchestra, was very tastily decorated with beautiful specimens of flowers and plants, kindly furnished by Mr. P. Crowley from his well-stocked conservatories. The President (Mr. Murton Holmes) exhibited a large collection of original drawings of sponges, also of minerals and fossils, while much interest was attached to some valuable autographs, notably those of the Queen, Prince Albert, Duke of Wellington, and Darwin. Botany and natural history were well represented by numerous examples exhibited by Dr. H. Franklin Parsons and Mr. H. F. Mennell. Bacteriology was adequately represented by Drs. F. R. Blaxall and J. M. Hobson. Mr. E. Lovett, Mr. R. F. Robarts, and Mr. J. O. Pelton showed a very large and most interesting collection of native manufactures from India and North America, Ashantee and New Guinea, and Japan respectively. Mr. Sturge showed two coloured plates, illustrating railway rolling stock at the commencement of the railway era, and Mr. C. H. Goodman some curious specimens of insect architecture. Mr. P. Crowley's gorgeous display of American butterflies and moths was a thing to be seen, admired, and remembered, and, when illumined, as they were, with the magnesium light, the splendid colours on the wings "were a sight for to see." One of the attractions was the exhibit of Mr. W. F. Stanley, showing Argon and Helium in tubes, through which an electric current was passed, the former giving a blue and the latter a pale green colour; and, when the spectra of these gases were shown, the difference between them became still more apparent. In the corridor, and also in the smaller hall, the Photographic Section had an excellent display of some hundred photographs, sent in by members of the Society; of these, Mr. C. F. Oakley contributed twelve direct silver prints of his very beautiful Windsor Castle and Frogmore series. Mr. C. Moss showed a fine set of five carbons, especially noticeable for their cloud effects; Mr. J. Epps, jun., sent three bromides of Exeter Cathedral;

Mr. R. F. Grundy, Hon. Secretary, two frames containing six very pretty 5×4 silver prints; Mr. A. Roods, Librarian, contributed nine platinum prints, including some capital interiors; Mr. A. Underhill sent in three large platinum prints; Mr. A. Moss an enlargement, on Nikko paper, of a very old and curious tree in Nonsuch Park, near Cheam; Mr. W. H. Dodd showed six fine specimens of Scottish scenery, &c., being carbon on opal; Mr. J. T. Sandell sent nine magnificent specimens, 15×12 direct, from his well-known series of the Hall of the City Companies; Mr. C. H. B. Sparrow showed a choice selection of prints on the new Venus paper, the colour being much admired; Mr. J. H. Baldock, Recorder, &c., sent in eight frames, one being of prints on Venus paper, five were bromide enlargements, and two studies of chrysanthemums; Mr. J. Packham contributed a number of prints by the platinum process, which were subsequently subjected to his own "catechu toning process" for producing warm colour; Mr. A. S. Wild sent two bromides, and Mr. H. D. Gower, Hon. Secretary Photographic Section, three excellent platinotypes. In addition to these, some 500 lantern slides were exhibited in eight screens on the tables, the whole being the work of different members of the Society; while during the evening three lantern exhibitions were given, under the direction of Mr. J. H. Baldock, Lanternist to the Section, when 200 slides were projected on the screen, being contributed by Messrs. Rods, Hoole, Baldock, Grundy, Wild, Sparrow, and Oakley. About ten o'clock the company began to disperse, after what was by common consent acknowledged to be a very pleasant and successful evening.

Hackney Photographic Society.—December 3, Mr. R. Beckett presiding.—Mr. Hudson showed a well-exposed negative of subject illuminated by means of the incandescent gaslight ten feet away. Exposure on Cadett ordinary plate was ten minutes at *f*-16. Mr. GOSLING said that, when using one of the above-mentioned lights for reducing to lantern slides, he had been unable to get even illumination through negatives larger than quarter-plate, and the latter even required the light to be filtered through three separated thicknesses of ground glass, and this, of course, rendered the exposure necessarily long. The CHAIRMAN advised the use of two burners, placed one on each side in front of a reflector of white paper or card. He thought that the extra cost of the additional burner would be soon saved by the resultant economy in gas, as the exposure would be much shortened. Messrs. Butcher, of Blackheath, showed some of their latest novelties, of which the most noteworthy was the Primus hand camera. This is an extremely neat instrument, and the specimens shown at the meeting of the several kinds were much admired. Among other things that Messrs. Butcher showed were adaptable lantern-slide masks, silk slide binders, improved spot binders, tinted cover glasses, and a lantern jet for the incandescent gaslight.

Putney Photographic Society.—November 27, Mr. H. Faulkner in the chair.—An instructive chat was given by Mr. S. J. BECKETT on *Figure Subjects*. The lecturer gave many useful hints on taking portraits in places other than the studio, such as an ordinary room, conservatory, and out of doors, and also spoke as to how to obtain proper relief and the so-called Rembrandt effects of lighting. Dealing briefly with composition, chiaroscuro, he commented upon what to use or avoid in the way of backgrounds. The lecturer illustrated his remarks by diagrams, and showed several photographs taken by himself.

TUESDAY, November 3.—This meeting was held at the Lecture Hall, Werter-road, when Mrs. CATHERINE WEED WARD gave her lantern lecture on the *Shakespeare Country* before a large gathering of the members and friends. Dr. Cuthbert Wyman occupied the chair. The lecture, which was most interesting and descriptive, and fully illustrated by numerous excellent lantern slides of photographs taken by Mrs. Ward (many of them very difficult subjects), was followed throughout with the greatest interest by those present. The proceedings were brought to a conclusion by a hearty vote of thanks being accorded to that lady by Dr. Sheppard (Vice-President) and seconded by the Rev. Locke Macdona (ex-Vice-President). The lantern was ably manipulated by Mr. G. E. Martin.

FORTHCOMING EXHIBITIONS.

1895.		
December 18–20	Blairgowrie and District Photographic Association	J. C. Gorrie, Hon. Secretary.
,, 20, 21.....	*Nottingham Camera Club.	W. Edgar, 123, Clinton-terrace, The Park, Nottingham.
1896.		
March 2 6	*South London Photographic Society.	Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
,, 3 6	*Cheltenham Amateur Photographic Society.	Philip Thomas, College Pharmacy, Cheltenham.

*** Signifies that there are Open Classes.**

RECENT PATENTS.

APPLICATIONS FOR PATENTS.

No. 23,027.—"A Semi-photo-mechanical Process for Use in Process Work, Collotype, Lithography, and the like, and for Copying Paintings, Drawings, Photographs and the like, by the various Printing Processes." S. BERNARD. *Dated December*, 1895.

No. 23,031.—"Improvements in or relating to Photographic Cameras." H. PARK.—*Dated December*, 1895.

No. 23,063.—"Improvements in Stereoscopes." L. JEFFERY.—*Dated December*, 1895.

No. 23,067.—"Means for Reproducing the Colours in Photography, suitable also for Dyeing and Painting." J. A. M. DANSAC.—*Dated December*, 1895.

No. 23,070.—"Improvements in Apparatus for Displaying Pictures, Photographs, and the like." J. P. CLARKE.—*Dated December*, 1895.

No. 23,079.—"A Method of Producing a Stereoscopic Effect on the Screen." H. C. NEWTON and T. E. FRESHWATER.—*Dated December*, 1895.

No. 23,355.—"Improvements in Photographic Cameras." Communicated by K. Rentzin. Complete specification. F. W. GOLBY.—*Dated December*, 1895.

No. 23,389.—"Improvements in Apparatus for Examining and Displaying Transparent Photographs." J. H. IRWIN.—*Dated December*, 1895.

No. 23,458.—"Improvements in or appertaining to Hand or Magazine Cameras." F. W. HUDLASS.—*Dated December*, 1895.

No. 23,506.—"Improvements in Plate-holding and Changing Devices for Cameras." G. W. MITCHAM.—*Dated December*, 1895.

Correspondence.

☞ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

PROPOSED MEMORIAL TO THE LATE J. TRAILL TAYLOR.

To the EDITORS.

GENTLEMEN,—In reference to the movement for creating a memorial of our lamented friend the late Mr. J. Traill Taylor, I should like to point out that its value will lie in its being a spontaneous expression of feeling on the part of those who realise the loss that photography and photographers have suffered. I am naturally anxious to obtain as numerous and as strong a body of supporters as possible, but, at the same time, anything like a personal canvas for names would seem to be entirely out of place under the circumstances. May I ask, therefore, that those who may wish to signify their appreciation of Mr. Taylor's labours during his long and industrious career will communicate their wish to me, in order that their names may be added to the list.

Any suggestions with regard to the matter will be esteemed, and will be duly laid before the meeting on the 20th inst.—I am, yours, &c.,

3, *Upper Baker-street, Regent's Park, N.W.* ALEXANDER MACKIE.

THE CARBON PROCESS.

To the EDITORS.

GENTLEMEN,—We have read with considerable interest the concluding *Carbon Jottings* appearing a fortnight ago from the pen of your able contributor, Mr. Leslie Selby. The article has a special attractiveness for ourselves, as in it Mr. Selby identifies his carbon experiences very prominently with the materials manufactured by our firm, and we value the compliment. We welcome this latest enthusiastic champion of the process, and feel sure that his jottings will not fail to give an increased impetus to the process and attract fresh workers.

We are gratified to learn that Mr. Selby appreciates the artistic value of the prepared etching paper, and that he has mastered the difficulty which the novice sometimes finds in the transfer of the carbon image to the somewhat rough surface of this paper. With a little more experience he will, doubtless, achieve success with the rough Whatman's paper. We can assure him that it is used pretty extensively, and with proper treatment no more waste occurs with it than with any of the ordinary papers.

That Mr. Selby is possessed of much ingenuity and resource is evident from the fact that he boldly discards most of the appliances which, if not absolutely necessary, are certainly a great convenience to those desiring to work carbon with comfort. The sets which are referred to were compiled with a view to supplying a complete outfit to those commencing carbon as their *first* process, and they contain all the apparatus which an amateur would reasonably require to work the process conveniently.

Even the "usual trays" referred to by Mr. Selby have to be purchased at some time or other, and why not therefore procure them of a pattern which experience has shown to be the most useful? Obviously, ordinary negative developing dishes are of little or no service in the working of a process depending upon a plentiful supply of water at its various stages.

We can forgive the makeshift substitute for pressure boxes, but, when it comes to turning the mounting tray upside down to provide a squeegee board, is not Mr. Selby carrying his economical principles beyond practical possibilities? The mounting tray is designed to catch the superfluous fluid squeegeed from the back of the tissue, but its object is defeated if it is turned upside down.

We might pursue this matter further, and point out one by one the special values of the other articles enumerated in the set, but must not encroach too much upon your valuable space. We recognise that the matter is of interest and importance to carbon workers, and in next month's "Autotype Notes" we propose to say more upon the subject.—I am, yours, &c.,

C. SAWYER,
The Autotype Company.

PAPER NEGATIVES.

To the EDITORS.

GENTLEMEN,—I have welcomed with delight your attempts in recent mbers of the JOURNAL to persuade the makers of bromide printing pers to again put a paper covered with a negative emulsion on the rket, for I have been for some months past hammering at the East- n Company to the same effect.

Formerly I always used in my 15 × 12 camera an Eastman roll-holder, th rolls of twenty-four exposure paper negatives. I got excellent sults with these. The difference in weight between them and glass s a serious matter to one working in tropical jungles; they are easier print from on platinotype paper than glass negatives, and, in short, e had a really good thing. Why the manufacture of these was stopped, d the rollable celluloid film was put on the market in their place, I nnot understand. I have some experience of different photographic aterials, but the rollable film is beyond me. It won't keep in damp opical climates; even the smaller sizes won't lie flat in the roll-holder, id a bishop could not develop and dry them flat without using bad nguage.

If photographers would only grasp the fact that the rolls of paper gatives (not stripping films) are by far the handiest and easiest to use hen travelling, especially in the tropics; that the whole roll can be sent me without trouble for development, &c.; or that, if developed on the ot, the manipulations are easy, and the results, with the pyrogallol- da developer, are quite equal to the best results on glass; that the paper es not show any grain, and that prints in platinum are obtained better id with less trouble from paper negatives than from glass, I am sure, ow that I have you on my side, that a demand for them would arise. Why give up a really good thing for a love of novelty?—I am, yours, c.,

M. V. PORTMAN.

Port Blair, Andaman Islands, India, November 9, 1895.

TONING.

To the EDITORS.

GENTLEMEN,—I have spent many sleepless hours trying to work out, entally, a good toning bath for the new kinds of paper lately introduced, z., C. C., P. O. P., &c.; I have carefully read the articles and opinions at the gentlemen have published in the BRITISH JOURNAL PHOTOGRAPHIC LMANAC, namely, Webster, Smith, Elliott, and Emery. I must confess am no wiser; perhaps it is my stupidity. I have read somewhere that e oldest formula for toning was a combined fixing bath, gold and hypo da, and this method gave the most permanent results. As a chemist was taught that sulpho-cyanide of ammonia was a solvent for chloride silver, consequently the sulpho-cyanide formulas must be combined aths. It may be argued that the amount of sulpho-cyanide is insuf- cient to dissolve all the unaltered silver—here my ignorance may be anifesting itself again—yet I have obtained information as to the uantity of silver twelve square inches of gelatino-chloride paper contains. will not quote the amount, in mortal dread that the manufacturers ay be down on me.

An old (and should know) photographer gave me as his opinion, hat the greatest source of fading in silver prints was the excessive rength of the fixing bath.' Do, please, Mr. Editor, let me know, for rtain, how to produce single and double tones, and, above all, per- anent ones. I want to exhibit the results at the Photographic Exhibi- on in October, 1945, A.D.—I am, yours, &c.,

PERPLEXED.

COPPER PLATES FOR PROCESS WORK.

To the EDITORS.

GENTLEMEN,—The remark of Mr. Branfill respecting the roughness of rface would be due to deposited metal from an acid solution of copper, d this objection can be obviated, or perhaps entirely removed, by de- siting from a cyanide solution, and the method of working will pro- bly be this: After the plate was ground level, it would be coated in the t solution of copper cyanide, and any roughness could be then removed the final polishing, if such polishing should be required.

I think that such coated plates can be produced commercially at nearly e same cost as those now used without coating.—I am, yours, &c.,

13, *Shelgate-road, Clapham Junction.* FRANK MIALL.

THE JET TRIAL AT THE PHOTOGRAPHIC CLUB.

To the EDITORS.

GENTLEMEN,—The letters appearing in your issue of December 6, have own me certain things in a new light, and I hasten to say a few words explanation and even of apology.

I had, of course, nothing to do with, and no knowledge of, the report hich appeared in the various photographic papers. My being in the air was an accident due to my name coming next in alphabetical order the list of members; I accepted the post with perhaps too little thought, and did a seeming, but quite unintentional, injustice to Mr. Clay, to whom I hereby apologise. It was explained that the whole trial arose out of the acceptance by Mr. Clay of a challenge by me, and I confess that my thoughtlessness and Mr. Clay's modesty led to my taking a part more prominent than his; Mr. Wright even says Mr. Clay's name was "ignored." I was not aware of that.

As to the "referee" business: my impression was, and is, that Messrs. Wright and Hearson were to be referees in the case of a simple trial between Mr. Clay's jet and mine; but when Mr. Wright himself exposed a jet for trial I cannot see how he could act as a referee. I was not aware that Mr. Wright was ignored at the Club, I thought I saw him working a jet against others and working it very well too. Mr. Clay also seemed to be doing fairly well.

I am not aware that any jet was proclaimed victor, though the report gives one to understand so; I looked upon the whole affair rather as experimental, the idea of trying a lot of jets in public in a very short time being, so far as I know, new. And of a certainty, there was no finality intended, as is shown by the fact that another set of experiments on wholly different lines is fixed for an evening in January. I think the tendency of the report was to suggest that it was all over, and one jet proclaimed victor; which is a conclusion most carefully to be avoided.

From the very nature of the case:—the novelty of the experiment; the number of jets to be tried in a too short time; the lack of pressure of gas acknowledged on all hands; the fact that some jets were admittedly made with a view to the maximum of light irrespective of other conditions, while others (as my own) were ordinary commercial productions, the only true view to take of the whole affair is that it was experimental, not final, interesting not accurate.

Just to show your readers the folly of doing anything to interest or amuse or instruct the public, I may say that that I, personally, have had two complaints addressed to me; first, that a report was published at all giving any names; second, that along with names full titles and addresses were not given!

My humbly expressed opinion is that Mr. Hearson's time and ingenuity were not wasted; that we got at least the framework of a system of testing jets, and that the Photographic Club spent an interesting evening. The matters of statistics given by Messrs. Freshwater and Wright are, I believe, correctly stated.—I am, yours, &c., ANDREW PRINGLE.

To the EDITORS.

GENTLEMEN,—I have read the report of the meeting held at the Photographic Club, on November 20, in your JOURNAL of the 29th ult., also the letters from Mr. Lewis Wright and Mr. Freshwater, in your issue of the 6th inst.

Allow me to inform your reporter that Mr. Scarborough was *not* a competitor. I informed Mr. Scarborough of the competition, and he told me he should be present, but not as a competitor; therefore it is absolutely inaccurate to style him "winner;" and, as Mr. Scarborough is a friend of mine, and from what he told me after the meeting, I feel certain that he is the last man who who would wish to be represented in a false position.

If your reporter had studied my original acceptance of Mr. Pringle's challenge as set forth in the *Optical Lantern Journal*, he might possibly not have cut such a sorry figure as he has done by his report of the above meeting, and have saved me and my referee, Mr. Lewis Wright, some annoyance.

The contest was arranged between myself and Mr. Pringle with referees as stated by Mr. Wright, and, much as I regret the ignorance of your reporter and the way in which I was ignored, I have at least the satisfaction of having beaten Mr. Pringle, although my jet was out of order, having sustained some damage unknown to me, and which I did not discover until I "lighted up." It is perhaps superfluous for me to add that I am the Mr. A. mentioned in Mr. Wright's letter, and I am annoyed to think that I wasted his time on a fool's errand.

For some reason unknown to me, the conditions I agreed to with Mr. Pringle, and informed Mr. Wright of accordingly, were at the last moment shelved, and I consider the whole affair in consequence a "farce."

In justice to Mr. Ottway, whose work, in my humble opinion, is excellent, I do not hesitate to say that, had my jet been in proper order, I think Mr. Scarborough would have been a doubtful "first," although I rather take it as an honour to be beaten by two such skilled manipulators as Mr. Wright and Mr. Scarborough, regardless of whose jets they used. I am certain Mr. Ottway does not want a free advertisement; his motto is, "Res non verba," and those who know his work as I do will agree that that is his best advertisement. Trusting that your reporter will in future make himself conversant with facts, and thus avoid needless friction and annoyance, I am, yours, &c., RICHARD CLAY.

Bread-street Hill, E.C., December 9, 1895.

To the EDITORS.

GENTLEMEN,—Under the above title two letters from most excellent gentlemen appear in the current issue of your JOURNAL, and upon which I should like to briefly comment.

Firstly, as regards Mr. Freshwater, I, individually, and the Photographic Club collectively, will, I am sure, feel grieved to know that we have caused him pain in associating his name with a firm of opticians of undoubted eminence. I should not have thought it in any way derogatory, and hope it cannot be considered as serious defamation of character.

Mr. Freshwater finds fault with some words attributed to him. Really, if he reads them again, he will find they fairly condense what he now affirms he did say. But his words are somewhat ambiguous. Perhaps he intended to say, "Was the same brand of limes to be used on all the jets?"

Mr. Lewis Wright writes a prodigiously long letter on the same subject, and from it I gather that Mr. Wright is under some misconception regarding the whole matter. The Club simply tested one jet against another with a Bunsen photometer, and found that there was a very great difference in the illuminating power of limelight jets under somewhat abnormal conditions. Further tests in the lantern were reserved for January 22, and I venture to think it would have been better for Mr. Wright to have waited till after these other tests than have written to explain why his jet was beaten in the preliminary trial.

I fail to see that any injustice was done to Mr. Wright, for only the name of the maker of the winning jet was mentioned in the meeting; but, if Mr. Wright's jet was No. 8—as the letters in your JOURNAL seem to imply—then Mr. Hearson's table of results, which I append, may prove interesting. It will be noticed that enormous quantities of gas were being used by the four leading jets, all of which were consuming over twenty feet per hour. I think it would be well, in a future test, to limit the gas to such an amount as would be used in a lantern entertainment, and at which the light could be constantly maintained. If Mr. Wright wants thirty feet of the mixed gas per hour—as he seems to suggest in his letter—in order to properly test his jet, I am afraid he will only prove it to be an interesting scientific instrument, and not such a one as most lanternists would care to possess.

I hope that before the date of the adjourned tests Messrs. Wright and Freshwater will see their way to co-operate with those who, with them, are only desirous of improving the illuminating power of jets.

The Committee of the Club would, I am sure, only be pleased to consider any suggestions which might come from two such well-known experts in optical projection.—I am, yours, &c.,

JAMES A. SINCLAIR.

26, *Charing Cross-road, W.C., December* 9, 1895.

Order.	No. of Jet.	Cubic feet of Gas consumed per hour. Coal Gas.	Oxygen.	Relation of Illumination in terms of— The Less.	The Greater.	Number 3.	Number 8.	Number 5.	Results Arranged in the Order of Illuminating Power. No. of Jet.	Ratio.	Oxygen.	Coal Gas.
A	1	6·50	7·23	1·00	·75	·75	·74	·44				
	3	7·60	9·15	1·34	1·00	...	...	...	5	1·00	*	10·25
B	2	5·50	6·40	1·00	·99	·99	·98	·58				
	3	5·80	9·60	1·11	1·00	,,	...	...	12	·95	*	10·00
C	8	7·80	8·32	1·21	1·00							
	3	8·00	8·64	1·00	·99	,,	·99	·59	7	·72	*	9·77
D	8	9·58	9·60	1·51	1·00							
	4	7·60	9·34	1·00	·66	,,	·66	·40	8	·60	*	10·25
E	8	9·87	9·60	2·15	1·00							
	11	5·75	5·28	1·00	·46	...	·46	·28	3	·59	8·64	8·00
F	8	10·25	*	1·00	·60	,,	...	·60				
	5	9·66	*	1·65	1·00	...	...	...	2	·58	6·40	5·50
G	7	9·77	*	1·00	·72	,,	,,	·72				
	5	9·50	*	1·38	1·00	...	...	...	6	·54	6·01	5·83
H	9	6·40	6·18	1·00	·38	,,	...	·38				
	5	10·00	*	2·66	1·00	...	...	...	1	·44	7·23	6·50
I	12	10·00	*	1·00	·95	,,	,,	·95				
	5	10·00	*	1·05	1·00	...	...	...	6	·40	5·50	6·00
J	6	5·83	6·01	1·00	·54	,,	...	·54				
	5	10·00	*	1·85	1·00	...	...	...	4	·40	9·34	7·60
K	5	10·25	*	2.50	1·00							
	6	6·00	5·50	1·00	·40	...	...	·40	9	·38	6·18	6·40
L	5	10·25	*	3·90	1·00	,,	...	1·00				
	10	Ether	4·16	1·00	·26	,,	...	·26	11	·28	5·28	5·75
...	...	...	...	...	...	...	...	...	10	·26	4·16	Ether

NOTE.—The asterisk (*) denotes that more than ten feet of gas were being used. At this point the index of the measuring instruments went beyond the limits of the scale. No. 6 having complained that there was an insufficient supply of gas at that end of the photometer, the ends were reversed, and the experiment repeated.

To the EDITORS.

GENTLEMEN,—I must ask to be permitted to correct one statement in my friend, Mr. Lewis Wright's letter, in your last issue, respecting the jet competition which took place at Anderton's Hotel on the 20th ult., viz., that the bores of his jet and mine were "approximately one-tenth of an inch." Mine was one-sixteenth of an inch only, or *forty per cent smaller* than his.

I quite agree with Mr. Lewis Wright that, since there was not sufficie pressure of gas to work both jets at their full power simultaneously fr the same cylinders, the results obtained were not conclusive, but I sh be very pleased to have a friendly competition at any time, public private, with Mr. Lewis Wright or any one else who may challenge *bore for bore, identical limes*, and subject to any other reasonable con tions that may be imposed, the only reservation being that the jets m be of a different make to my own.

I do not care a brass button whether my jets are better or worse th anybody else's, but I do most firmly believe that Ottway makes a mo powerful jet, *bore for bore*, than any other maker, and am prepared to my best to justify that opinion against all comers.

I may add that the one-sixteenth of an inch jet I manipulated on t 20th inst. is not the only one that has to be beaten. I have one of or twelfth of an inch bore in reserve which gives, I believe, quite one-thi more candle power than my one-sixteenth of an inch, and, if Mr. Lew Wright can beat these two *bore for bore*, his new idea will have prov itself, and doubtless cause a new departure in jet-making.

When that happens, no one will more heartily congratulate him tha yours, &c., W. SCARBOROUGH.

P.S.—Since writing to you on the 7th inst., I am informed by M Lewis Wright that he not only made a mistake in stating the bore of r jet to be $\frac{1}{10}$ inch, but also in regard to his own.

To the EDITORS.

GENTLEMEN,—I am the "unfortunate" whose well-meant report of t proceedings of the "Photographic Club" has raised the querulous lett by my good friend Mr. Freshwater and the milder reproof of Mr. Lew Wright. As my precursor in the office of Editor of Transactions to th august body, the Club, you, Mr. Editor-in-Chief, will know how diffic it is to satisfy the aspirations of the reported!

I feel that Mr. Freshwater is dissatisfied rather with the meeting its than with my report of it, or why does he say in his ultimate pa graph: "I should much like to add a few of the various comments heard that night, but perhaps I had better not?" and so, from d satisfaction with the conduct of the meeting in general, he has proceed to find fault with the report in particular.

Dealing with his complaints in detail, he asks: "Why was my na bracketed with Newton & Co.? They had nothing nothing whatever to with the gas-testing?" Well, sir, the report neither says nor sugge that they had. If Mr. Freshwater doesn't like the conjunction of nam I can only say I'm sorry and surprised, but it shan't occur again.

As to the limes, I understood my friend to ask a very pertinent questi which in the main was this:—Might the competitors do whatever th liked as regards the use of limes?—that is, could they use hard or soft, a replace them as frequently as they desired?—and the exigencies of yo space condensed the question into the short compass of "Might fre limes be used?" I don't think that was a very silly question! A matter of fact a great many fresh limes were used, and this was a dir result of the permission to do so, which again was a direct result of question.

As to my omission to mention the names of Messrs. Clay and Le Wright, *there* Mr. F. has me, and I admit it. It was an inadvertence my part. The next complaint is that the "readings" were left o As the report says they would be published at *some future time* this i little rough on me. Like the peal of bells which were not rung when Virgin Queen entered an Essex village because there was no peal, figures were not included because at the time of the report there were figures, Mr. Hearson not having had time to collate them.

Mr. Lewis Wright's letter, so far as it deals with the report, I can re to in a few simple words. I have been unfortunate enough to omit a reference to him and—seriously—I am sorry because I ought to have d so, it was due to him; and would have increased the interest in the repo but as he says in his letter at the meeting, "both Mr. A. and myself w quietly ignored," and of course I only reported the meeting as it occurr I must leave all the personal matters to be decided by the part interested.—I am, yours, &c., S. HERBERT FR

12, *South Villas, Camden-square, N.W.*

REPORTING AT PHOTOGRAPHIC SOCIETIES.

To the EDITORS.

GENTLEMEN,—When we wrote to you complaining of the inadequate porting of societies' meetings, as exemplified by the wretched report of Infallible hand camera shown by Mr. Brothers at the recent meeting the Manchester Photographic Society, we had not the least idea that reporter was actuated by ill will towards either Mr. Brothers or camera, which he, in his desire to benefit the Society, volunteered show at that meeting, and we were a little surprised by your edito remark at foot of our letter.

In this week's JOURNAL, however, there appears an anonymous lett signed "A Member," which is so full of animus, so brimming over w

een, that we think you must be gifted with the prophetic instinct or h the faculty of thought-reading.

The anonymous letter mentioned is of a type which should be treated h the contemptuous silence which all anonymous letter writers erve, but its insertion in a journal of such standing as yours gives it ertain importance, and if we on that account depart from the usual urse it is only to prevent the public from getting a wrong impression d our camera from being injured. With "A Member's" animus vards Mr. Brothers we have nothing to do. An eminent scientist of s recognised position to which Mr. Brothers has attained, both in otography and other more important sciences, may very well afford to at with contempt the efforts of those who attack him under cover of a *m-de-plume*. But it is different with us. We have introduced a hand mera which, we believe, will revolutionise hand camera work as ectually as Mr. McKellen's stand camera of 1884 revolutionised stand mera work at that time, and we protest against the officials of any ciety making use of their official position to further the interests of ponents who are interested in keeping this instrument in the back-ound.

Why has not the reporter himself come out of his shell, and why does t "A Member" sign his name so that we may know by whom we are posed.

At the risk, therefore, of being charged with the unworthy motive with nich "A Member" has so generously charged us, we have to appeal to ur fairness to allow us to take up a little more of your space in reply "A Member" than we would venture to ask for were our cause less st.

"A Member" says the report given in your JOURNAL was a full report the exhibit as described by Mr. Brothers, and the whole time occupied showing it was not more than five to eight minutes; and that no amples of work done by the camera were shown. Assuming the truth this latter statement, we have only to say that we furnished Mr. rothers with about half a dozen photographs, snap-shots, of different rieties of subject, taken by our Mr. McKellen; and, if they were not own, it is a great pity. But, supposing the description of the camera ly occupied five minutes, how can it be possible to fully report that mount of description in words numbering under twenty, which is about e extent of the report referred to.

We complained that the report stated the specialities of the camera ere simple changing and magazine, thus conveying the impression that ose were its only specialities.

When we recapitulate the movements, which we claim for the Infallible, u will see that we are justified in complaining of the way we have been eated. They are: magazine taking twelve glass or twenty-four films, or a romiscuous mixing of them without changing the mechanism. An fallible mechanical changing system without regard to the position of e camera, and with little or no help from gravitation. A gripper which ys hold of the exposed plates, and prevents them from shaking about, nd an automatic indicator showing the number of plates exposed. The hole of these movements performed by one movement of the key rward and back. A safety automatic cut, of which covers the back of ns when the front of camera is to be opened to set the diaphragms, or ter the shutter speed, and a safety bolt which prevents the exposed ates being tampered with.

There was in this camera also, shown McKellen's patent lever safety utter, which is constructed of aluminium chiefly, and has no rubber out it, and which is set without uncovering the aperture. We will not cupy your space any more with reference to these points, but we will be leased to mail free to any of your readers who will mention your URNAL a copy of our newly issued description book which gives in ll detail all particulars.

We want to refer to "A Member's" remarks on the Heywood finder hich was mounted on the camera referred to. 'A Member' attacks it in nguage very choice. We beg to say that the camera exhibited had two nders of the usual reflector kind, and the other Heywood direct vision nder, of which "a Member" has so low an opinion that he elegantly says s user would "look like a fool." We want to say that that finder is not part of our Infallible camera, although we think so highly of it that we rongly recommend it, and those who use it would not be without it.

As to looking like a fool, surely, sir, the man who expects to get a true icture as seen by the eye from about the height of the stomach is a reater fool than he who makes his exposure from the position from hich he sees the subject. And who is the greater fool, the man who olds his camera in the correct position regardless of who looks on and nows that his exposure will be successful, or he who takes a happy-go-ucky shot from under his arm or from the pit of his stomach, and thinks ith ostrich-like simplicity that he has succeeded in hiding his operations om the amused spectators?

We trust we will not be called upon again to reply to correspondents ho do not give their names.—We are, yours, &c., THOMPSON & Co.

4, *Bull's Head-yard, Manchester, December* 9, 1895.

THE PHARMACY ACT.

To the EDITORS.

GENTLEMEN,—Your esteemed correspondent, Mr. Hume, fails to under-and the point that chemists, in addition to being liable to the same laws as himself, also enjoy the privilege of being fined for using a word too much or too little on their labels, also of being fined for vending a patent medicine containing a scheduled poison unknown to the vendor. Mr. Hume is not to be a monopolist of the martyr's crown.

The Pharmaceutical Society has existed for half a century, and during that period has expended half a million of money in founding an educational establishment, with reading rooms, lecture rooms, professors, and laboratories equal to any in Europe. It has obtained a Royal Charter, and is constituted the guardian of the trade in scheduled poisons.

The average photographic dealer invariably displays much ignorance in the matter of the position and power of the Pharmaceutical Society, which has permitted for years past its rule to remain almost unenforced. As regards the hunting out of some village chemist, who neither knows nor cares anything about photography, for the simple reason that it would not pay him to cultivate such business for the benefit of an occasional visitor to a benighted district. Such a one could be paralleled by the photographic "artist" who deals in chemicals, and calls himself a photographic dealer, but such examples prove nothing. The firms of Mawson & Swan, Reynolds & Branson, and others in the photographic business, are pharmaceutical chemists in the north of England, and in themselves constitute an answer to such grotesque arguments.—I am, yours, &c., PHARMACIAN.

THE DETENTION OF SPECIMENS.

To the EDITORS.

GENTLEMEN,—Is there no way of punishing those unprincipled persons who advertise for first-class assistants, and, having received specimens, &c., in reply, refuse to return the same, although stamps are forwarded for the purpose? It is an old grievance, and has often been discussed in the pages of the JOURNAL, and operators and others have been cautioned and advised; but I do not remember to have heard how one may obtain redress having once fallen into the trap as I did lately.

I answered an advertisement and sent a dozen of my best specimens with testimonials &c., only a post-office address was given in the advertisement, and I know I was foolish to depart from my usual custom of waiting for the firm's address before forwarding specimens.

I have written two polite requests and sent stamps for the return of my property, and I have since sent a letter threatening the party with the terrors of the law, but all to no purpose. What more can I do but warn others seeking employment to risk nothing of value until they have a business address.—I am, yours, &c., OPERATOR.

THE BRUSSELS EXHIBITION.

To the EDITORS.

GENTLEMEN,—Kindly afford me space to announce that I am undertaking the collection of British pictures intended for the Brussels Exhibition on behalf of the Association Belge de Photographie.

1. No awards are offered, but each accepted exhibitor receives the commemorative medal of the Society.
2. No charges for space.
3. Open to both amateurs and professionals.
4. Each print must be framed separately, but need not be glazed.
5. Pictures previously exhibited in Belgium are not admissible.
6. Entries must be *sent to me* not later than January 29 next.

Later on arrangements will be made for the dispatch of British exhibits in one case, each exhibitor paying his proportionate share of carriage. WALTER D. WELFORD.

Photo Review Office, 59 & 60, Chancery-lane, London, W.C.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Wanted, cabinet lens, 12×10 studio camera and stand. Will exchange Dallmeyer 7a lens, 24×20 camera, and table stand.—Address, H. W. WATSON, The Studio, Gloucester.

Sixty first-class stereoscopic negatives of English lakes and district, transposed and mounted, offered in exchange for No. 8 Ross portable symmetrical lens; must be in perfect condition.—Address, BERNARD GREEN, 1, Elm-tree-terrace, Cockermouth.

Fixed-focus enlarging camera, quarter to whole-plate, with four-inch and five and a half-inch rapid rectilinear lens, and three whole-plate double slides. Exchange for modern half-plate camera and slide, no lens required.—Address, L. CROSSLE, 18, Gorst-road, S.W.

Will exchange Optimus camera (half-plate) tripod, bag, three double book slides, side clips, Thornton time and instantaneous shutter, Taylor, Taylor, & Hobson rapid rectilinear seven-inch focus lens, iris, with new patent flange, all new and perfect, cost 12*l*., for a hand camera of similar value. Newman & Guardia or Adams's preferred.—Address, REGINALD LAMBSON, Photographer, Laura Villa, Woolston, Hampshire.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon.*

PHOTOGRAPHS REGISTERED:—

W. E. A. Drinkwater, Priory Art Studio, Wells, Somerset.—*Four photographs of two children with bowl of food.*

Ernest Marriage, Ellerby, South Woodford.—*Photograph of a capital in the court of the Church of Saint Ambrose, Milan. Subject, a mermaid and foliage.*

OTTWAY & CO.—In our next.

MASTER.—If the indentures are not stamped, you cannot compel the apprentice to serve out his time. He can leave when he chooses.

X. Y. Z.—With you we think that a light of 700 candle power far too little for portraiture. With the electric arc light, some photographers use ten times that amount.

D. ROBERTSON.—Surely, if you had consulted our advertisement columns, you would have had no occasion to write and ask where Christmas mounts were to be obtained.

CYMRO.—Hardwich's *Photographic Chemistry*, the back numbers of the JOURNAL, and Burton's work on *Photographic Printing Processes* would all be good for the apprentice.

LENS says: "Would you please inform me where I could purchase Captain Abney's *Instructions in Photography*?"—Of Messrs. Sampson Low & Co., St. Dunstan House, Fetter-lane, E.C.

EDINBURGH.—The design of the studio will do very well; but we should advise its length being increased, if possible. The length, as shown (twenty-four feet), is a little short for general professional work.

H. R. P. says: "Kindly inform me where the Indestructible Mantle for incandescent gas lamps may be had, as referred to in "Lantern Mems" by G. R. Baker, in the Supplement to your JOURNAL of December 6."—We have no further information at present.

W. B. B.—The portrait lens is quicker than the euryscope when both are worked with their full aperture. When they are stopped down to equal ratio there is practically no difference in their rapidity. To cover a large field both will require to be stopped down.

T. N.—We know of no paper so free from metal spots as that specially made for photographic purposes, such as the Saxe and the Rives. Both are expensive, but the freedom from metallic particles is a very good set off when the paper is required for photography.

JAMES HOOPER & SONS write: "Please give name and address of makers of the microscope lamp which you described as of 'small size and ingenious construction' a week or two back."—We have no further particulars. Better address Mr. Goodwin, care of the Quekett Microscopical Society.

J. T.—1. Yes; you may possibly obtain a lens at the price to suit your requirements. Get the firm you name to let you have one on approval, or consult a photographic friend. 2. Same remark applies to the camera. A cheap work on elementary photography would probably be of assistance to you.

W. SMITH says: "I have some bromide paper which has accidentally been exposed to the light. Is there any way to work it, or is the paper useless?"—The paper could probably be restored; but it will be cheaper and better in the long run for you to throw it away and procure fresh paper.

DEPOSIT.—We cannot say if the copyright has expired, though probably it has. You can make your own work copyright. We can give no idea as to the value of the print. 2. The rectilinear lens is not nearly so quick as the portrait lenses mentioned. 3. We cannot undertake to make any such arrangement as you suggest.

WALWORTH.—If the carbon print splits off the copper plate when it becomes dry it is no doubt due to the metal being somewhat greasy before it was grained; that is, supposing that the squeegeeing was properly done, and the tissue was in the right condition at the time. From your knowledge of the carbon process we conclude that such was the case.

J. SPARK.—The electric light is by far the best. Acetylene is not yet really practical. The Welsbach light will answer, and it may be fitted in a portable way. You cannot do better than write to the London office of the Company, as they, some time ago, made somewhat a feature of their light for studio purposes. They will send you particulars.

A. MCDONALD.—1. The copyright is yours, though you would have done well to have registered it when the photograph was taken. 2. Write to the publisher, and ask him for your fee for its use. If it is not paid, put the matter in the hands of a solicitor well versed in copyright law. Why do you not join the Photographic Copyright Union? It would have done the work for you.

H. MEYER (Frankfurt).—The general size of the condensers of English lanterns is four inches, equal to about ten centimetres. As a rule the limelight is used, and not an oil lamp, unless the size of the screen is small, or gas not available. A lantern with the size condensers named will not, however, do for enlarging, except from very small sizes. For an enlarging lantern the diameter of the condensers must not be less than the diagonal of the subject to be enlarged. We are quite aware that the lantern has not yet reached the popularity in Germany that it has here. Probably it will do so. The addresses of the best makers of lanterns will be found in the ALMANAC.

PERPLEXED writes: "A photograph which was priced at 3*l*. 3*s*. gained a silver medal at an exhibition, where there were five persons anxious to purchase it. The photographer therefore printed four more copies off, and had them framed exactly the same as the one exhibited. No one could see any difference between them; but one of the purchasers, finding that the photograph he had bought was not the identical one that was exhibited, now desires to return the photograph and receive his money back. Can he legally insist upon this?"—Certainly he can, if he bought the picture that was exhibited and another was supplied. When a person buys a thing he is entitled to it, and can refuse to receive anything else. If the price was fixed for duplicates of the picture shown, that would be different.

SPOTS writes as follows: "The enclosed cabinet photograph having come to my notice, I examined it carefully, and find, I think, what has not before been so marked a case of spotting as this particular print. If you will kindly examine same, you will find the spotting has taken place only in the vignetted part, or the part where the light acted on the paper through the vignetter paper. Will you be good enough to give me your opinion why this is so?"—The spots, at present, are more pronounced in the lighter portions of the prints though they are not confined to the vignetted portions alone; they show also in the half tones of the portrait generally. They show equally as thickly in the deepest shadows, but they are less noticeable there now, though they would become more prominent if the print was kept longer.

WIDE ANGLE says: "Kindly inform me—1. Most suitable focus lens as an average wide angle for 12×10? Do you think Dallmeyer's wide-angle rectilinear seven-inch for 12×10 suitable? Is it not very short? What would you say to ten inches? I should want it mostly for interiors, and shall have to confine myself to the wide angle. Your advice on this would be very acceptable. 2. Where can I obtain the addresses of all the photographic publishers (views) in England, Scotland, and Ireland?"—1. The first lens named will include a very wide angle, though not a wider than is sometimes required. With such a wide angle the perspective must always be violent, and, for that reason, often objectionable. *Wide* angle lenses should always be avoided when a narrower-angle one will include the subject desired. 2. No list, so far as we are aware, is published.

H. H. W. says: "I am thinking of fixing a camera in my dark room for making lantern slides from half and whole-plate negatives, as per sketch on other side, and should be glad of your advice if it is the best way. 1. Will the top (through wall) be better straight or at an angle of 45°, as shown? 2. Should the sides be straight or at same angle? 3. Will there be any advantage in having ground glass where marked? I may state that the wall faces east on upper floor, and no obstruction from trees, walls, &c. I only work in the afternoon, so there would be no sun on it? 4. Would a sheet of opal glass below, at an angle of 45°, be any advantage?"—In reply: 1. The wall may be straight, but we recommend the opening to be sufficiently large to admit of the camera that carries the negative to be put nearly through the wall. 2. Not necessary if the negatives be near the outside. 3. Yes. 4. Yes, decidedly.

FRENA says: "I shall esteem it a great favour if you can help me by answering the following queries:—1. I have a lantern which at present I use a four-wick lamp with, and I throw a circle of about eight feet. I find that when I focus some objects, others will be out of focus, although the slide is in good focus *as a slide*. What do you think would cause this? Is it the fault of the lens, or is it possible that the lamp light not being sufficiently strong for that size disc, would cause it? 2. Do you think the incandescent light would be more useful for my purpose? 3. Do you know any makers of a dissolving carrier for single lantern; and if so, whose is best? 4. Do any weekly or monthly papers promote the exchange or lending of slides amongst readers; if so, which?"—1. Evidently the objective has too round a field. Get one in which the field is flatter. 2. The incandescent light is good for lantern work. 3. Write to any dealer in lantern goods. 4. Not that we are aware of.

*** Several answers to correspondents unavoidably held over.

CONTENTS.

	Page
TRANSFERRING FILMS WHILE WET	785
LINE REPRODUCTIONS ON EMULSION FILMS	786
THE ARTIGUE PAPIER VELOURS AND DIRECT PIGMENT PROCESSES. By ALFRED MASKELL, F.S.A.	788
PHOTO-MECHANICAL NOTES. By WILLIAM GAMBLE	790
REMARKS UPON ORTHOCHROMATIC PHOTOGRAPHY AND THE METHODS OF SPECTROGRAPHIC TEST. By DR. J. M. EDER	791
OUR EDITORIAL TABLE	792
NEWS AND NOTES	793
MEETINGS OF SOCIETIES	794
FORTHCOMING EXHIBITIONS	796
RECENT PATENTS	796
CORRESPONDENCE	796
EXCHANGE COLUMN	799
ANSWERS TO CORRESPONDENTS	800

THE BRITISH
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ENLARGEMENTS BY WAY OF ENLARGED TRANSPARENCIES.

At the recent meeting of the Royal Photographic Society, when Mr. Valentine Blanchard described *A Method of Carbon Printing without Transfer*, he directed attention, once more, to a system of making enlarged negatives that is very little followed by amateurs—or, indeed, by professionals—although in many respects it is better than the method generally practised. The usual plan of making enlarged negatives is first to produce the transparency, either by contact printing on a dry plate or by the carbon process, and from that to make the enlargement in the camera. Those who work under this system have often remarked the difference in the sharpness and crispness of the enlargement thus produced and that obtained when the enlargement is made direct in a single operation as on bromide paper. We are now referring to the general work of amateurs, and not to that of highly skilled operators. It will be obvious that the quality of the resulting enlargement must be dependent upon the excellence of the small transparency, because any imperfection or lack of sharpness necessarily becomes conspicuously emphasised in the enlargement.

The system Mr. Blanchard advocated the other night is to make the enlargement direct from the original as a transparency, and then from that to make the negative by contact printing. By this means it will be seen the greatest possible sharpness that the original possesses is secured in the transparency, the same as it is in a bromide enlargement. Any slight imperfections in the plate upon which the large transparency is made will be only trifling, whereas, in the case of a small transparency, they are magnified in proportion to the amplification, as, of course, would also be any loss of sharpness arising from want of contact in the printing from uneven glass or other causes. Another great advantage of this method is that there is a very wide scope in improving the result by retouching to an extent that is impossible on a small transparency on account of the hand work being magnified in the amplification. By working on the shadows and darker portions in the transparency and the lights and more delicate portions in the reproduced negative, enlargements from faulty negatives may be obtained which are often far superior to the originals.

It will be surprising to some to learn that this method was, some four-and-twenty or more years ago, vended as a secret process, the fee being, we believe, ten guineas, and a goodly sum was realised by the business. Seeing the advantages accruing from the method of making enlarged negatives, it is somewhat surprising that it receives so little attention at the present time when so many amateurs make enlargements. Let us now consider the practical part of the subject.

At the time the system was first introduced the wet-collodion process was in vogue, and by it the transparencies were made; but now gelatine plates will commend themselves for the purpose as being more convenient, while the results obtainable with them are quite as good as by the older process. As the perfection of the finished work largely depends upon the transparency, it goes without saying that it must be as good as possible. It should be very fully exposed, and the image strong and vigorous. There should be no bare glass, except in the extreme high lights, and even these may be slightly veiled at times with advantage. The transparency may be retouched, the shadows strengthened to any extent that may be desired. This, on a large transparency, is easy to do, even by a novice, as the lights and shades are as in nature, and not, as in a negative, reversed. The transparency could also be made on bromide paper if the fibre of the paper, in the finished picture, is not objected to, as it would not be by some of the impressionist school. If bromide paper be used, the exposure must be considerably longer, and the development carried much farther, than for a paper picture.

With regard to the negative Mr. Blanchard advocated many years ago—and we think does so still—it being made by printing on albumen paper, the printing being carried to a considerable depth, so that the darkest portions are deeply bronzed—the paper was not toned, but simply fixed. It was then made transparent with oil or by waxing. Of course, bromide paper could be used in place of the albumenised, but the image must be made tolerably dense. Many of the anti-impressionist school will, doubtless, prefer to have the negative on glass, and that, of course, is easily obtained by printing from the transparency on a dry plate.

In a paper read before the old South London Photographic Society, on the production of enlarged negatives, many years ago (see p. 86 of our volume for 1873), Mr. E. W. Foxlee recommended the negative being made by the carbon process, it being developed on a glass plate. In this way the image is obtained reversed, so that it is at once right for carbon printing by single transfer. If we mistake not, the famous carbon enlargements—*Lions in the "Zoo,"* by Mr. H. Dixon, were produced in the way just referred to. Seeing the power this plan

of working places at our command, it is, as we have just remarked, somewhat a matter of surprise that it is so little followed by those who make their own enlargements in carbon or platinum, especially when the sizes are small.

If the sizes were large, the question of cost might be an important one, because two full size plates have to be used instead of one, and one the size of the original. But when the size is small—say twelve or fifteen inches—sizes the amateur seldom exceeds—the trivial additional cost is scarcely worth consideration, particularly considering what an opportunity there is of obtaining better results than there is by the more generally followed methods. Perhaps, now that attention is called to the system, which may even be new to some, it will receive more consideration in the future than it has in the past.

PRACTICAL EXPEDIENTS IN CONNEXION WITH EMULSION FILMS FOR PROCESS WORK.

It has suggested itself to us, since we wrote on the subject of emulsion films last week, that we passed over without mention one or two expedients that may be successfully utilised in overcoming some of the inherent difficulties in the working of emulsion plates for purposes of reproduction, but the exigencies of space prevented us going further into the subject on that occasion. It is scarcely surprising that some of the less progressive workers in that department of photography should seize upon our article as further proof of their inveterate belief in the utter unsuitability of "dry plates" for their particular purposes; but we took care to express the opinion that, if properly used, in spite of certain minor drawbacks, such plates are quite as capable of yielding perfect results as are those prepared with wet collodion; and, if the captious ones will only devote a tithe of the care to their study that has been given in the last nearly half century to wet collodion, we have little doubt the results will be far superior.

Let us glance for a moment at the terms "opacity and clearness," so freely and generally used in speaking of process negatives. These are, in fact, but relative terms, and represent the conditions or qualities aimed at, with more or less, but never perfect, success, by the process worker. The ideal negative of an engraving or etching would, if viewed as a positive, show every finest line and dot in the highest lights with as perfect clearness and sharpness as the coarser lines in the shadows; but take the most perfect wet-plate reproduction of such a subject, and press it closely in contact with a perfectly smooth black surface, and what have we? In the shadows and most of the half-tones, it is true, the lines exhibit a beautiful clearness and sharpness equalling, or even surpassing, in those respects, the original, but the highest lights are represented, not by clear lines or dots, but by a half-tone rendering caused by a slight veil over those parts, which, while thick enough to obscure the clear black of the backing, is not dense enough, or should not be, to hide the modelling of the subject. In the very best examples of this class of work it may require close scrutiny to detect any appreciable veil by transmitted light, but it is seldom, or in instances of very fine work never, absent, and we doubt whether, in the strictest sense, it is possible to achieve perfect clearness in the most delicate lines of a fine engraving.

The ideal negative, if placed in the printing frame with a piece of ordinary sensitised paper, would almost immediately on exposure to light give a perfect, though very faint, image of the whole subject; that is to say, the very finest lines and dots would print through as quickly as the heaviest shadows, and the only change that occurred under prolonged exposure would be the darkening of the image. Further than this, if perfect opacity accompanied absolute clearness, a point would be reached at which no further change would be possible, however long the exposure was prolonged. But take the average "line" negative, and it will be found that the high lights hang back more or less, just as they do in an ordinary half-tone negative, and that it is necessary to continue the exposure long after the shadows are deep enough in order to get sufficient strength in the lights.

Hence the reason of the supposed necessity for absolute opacity; the deposit must be dense enough to permit a certain amount of over-printing of parts of the negative, in order to overcome the shortcomings of other portions in the shape of the unpreventable veil. And in practice a "perfect" negative is one that will admit of sufficient strength being obtained in the high lights without rendering the shadows too heavy; it must be dense enough to realise that feature mentioned in connexion with the supposed ideal of allowing the image to arrive at a stage—in the shadows—beyond which it will not change during the period required for the high lights to acquire strength. Obviously, therefore, the actual density necessary depends upon the amount of "filling up" of the high lights, and this will, of course, vary again to some extent with the printing process employed and with other circumstances. For all practical purposes, therefore, opacity and clearness are but relative terms; and, provided the working conditions we have mentioned are complied with, the only difference in the final result will be that a longer time will be taken in printing than would be the case with the ideal negative.

Turning now to the actual defects referred to in our article last week, which, like the above remarks, applied chiefly, if not wholly, to purely line work, it has been pointed out to us that the tendency on the part of the emulsion films to fill up the high lights is, or may be, an actual advantage in screen work; one correspondent, in fact, avers that he gets far superior results with dry plates than with wet, owing to the comparative ease with which he can "close up" the dots in the high lights. This may be perfectly true in the particular instance, and in others, while under different conditions of working, a different ruling of screen, different screen distance, or different size and shape of stop, our correspondent might probably find himself all "at sea," through placing a too implicit confidence in the perfection of working of one particular set of circumstances. We would point out, therefore, the advisability of knowing how to secure as near an approach as may be to perfect clearness of image, although it may not be always absolutely necessary, and after that to study, with care, how far that condition may be departed from for securing particular results.

Amongst the suggestions that have reached us is one, to the effect that backing the plate is a necessary condition in securing the integrity of the transparent lines. We have very little hesitation in saying that, although this practice will in no case do any harm, it is only under very exceptional circumstances that it will do much good. Backing the plate to prevent reflection from the back of the film is very useful in landscape work, or where there are very strong contrasts, as between the sky and dark foliage, or about the windows of interiors; but no such contrast exists between the blacks and whites of an engraving. It is possible that, in working with a strong light from a negative or a transparent positive, a sufficient contrast might

be created to render backing useful, but for ordinary work—and we speak from an experience with films of every degree of transparency—backing is practically useless. As a matter of fact, the emulsion films that show the greatest amount of "halation," or filling in of the high lights, are those possessing the greatest opacity, while the very thinnest and most transparent dry-collodion films produce, perhaps, the clearest and crispest of images.

The spreading of the image, referred to in our last, is not due to reflection from the back, but rather from the individual particles constituting the film, and, to illustrate its origin or cause, we need only adduce the old and familiar simile of a ray of sunlight passing through a dusty and a clean atmosphere respectively. In the one case the floating particles arrest the light and become luminous, in the other the beam of light passes on its way unnoticed. Similarly in a dense opaque film the light is arrested and reflected from particle to particle, producing more or less local action, whereas, in a clear transparent film, it passes clean through, and that portion of it that may be reflected from the back, comparatively small as it is, again passes through without effecting any serious damage.

To prevent this internal reflection or spreading as much as possible should be the aim; but clearly rendering the back of the plate non-reflecting is no remedy, and it is questionable whether there really is any universally effective one, for different plates vary very much in their behaviour under the same treatment, just as those of apparently indentical character vary considerably in the degree to which they are subject to the defect; but, when we meet with two apparently equally opaque films that behave very differently in regard to the clearness of their lines, we may safely set the result down to some pecularity in their preparation, and it will usually be found that it is the finer-grained film that gives the best result. As a rule, too, it may be accepted that the slower plates give greater clearness than the more rapid, possibly for the reason that the bromide of silver is in a finer state of division; but this is not invariably the case, for more than one of the most rapid brands of plates on the market at the present time are remarkable for their freedom from halation, under ordinary circumstances. Where this is found to be the case, a further investigation will most probably disclose the fact that the films contain a considerable proportion of iodide, which, partly by its colorific power and partly also, no doubt, by mechanically separating the particles of bromide, tends to reduce the internal spread of the image. Those, then, who desire to use emulsion films with the greatest freedom from these defects should select such as contain iodide, which may generally be detected by the deep yellow colour.

Iodide of silver has for many years past been added to emulsions for the purpose of arresting halation; and, seeing its efficacy for the purpose, those who objected to its introduction on other grounds have sought to effect the same purpose by staining the films yellow, red, or other suitable colour. The peculiar advantage of the iodide is that it effects its purpose without appreciably lowering the sensitiveness of the film; indeed, it is claimed by some that it has the opposite effect; but of the lowering action of ordinary dyes there can be no doubt. This is only as might be expected, since, if by staining the film we stop the light from flying from particle to particle in a lateral direction, we must also, more or less, limit its power of penetration in a legitimate or downward direction. But the efficacy of the staining method is dependent on the infinitely feeble character of the light reflected in the film as compared with that which reaches the plate from the object, and it is possible to entirely annihilate the one without any very serious result in the way of prolonging the exposure. Except, in fact, for very rapid work, the effect in that direction may be ignored.

Various dyes have been employed for the purpose, including turmeric, aurine, rosaniline, the eosines, and others, but, whichever be chosen, it must be borne in mind that, the deeper the colour and the larger the quantity employed, the more serious will be the effect on sensitiveness. Thus any of the red dyes named will produce an appreciably greater slowing effect than the yellow without securing any adequate advantage; indeed, the amount of colouring actually necessary is so comparatively small that there is no inducement to go to dangerous lengths. A few drops of tincture of turmeric or of solution of aurine—we prefer the former—added to the emulsion until the colour is barely affected, or applied to the film as a separate bath, will add very materially to the clearness, and indirectly to the vigour of the resulting negative.

Since the first portion of this article was written a suggestion, which appears in another column, has reached us from Mr. W. B. Bolton. It refers to the employment of multiple-coated films, that is to say, of films composed of two layers of varying sensitiveness. Some two years or more ago, in the early autumn of 1893, we made a series of experiments with ordinary gelatine plates, afterwards coated with collodion emulsion, and found that the compound films so formed possessed a most extraordinary elasticity of exposure. It is now proposed to press this system into use for process work, in order to obtain what we described last week as a "flat, strong image," that is, one in which the lines of the lights and shadows are impressed without a great amount of contrast. We have only had time to give the plan a very rough trial, but the result is remarkable. A gelatine plate of very great rapidity—the first to hand—was coated with an ordinary unwashed collodion emulsion, and, after immersion in a dish of water, to remove the soluble salts, it was exposed wet. The light was bad, and it was found by trial that five minutes' exposure was required with the collodion alone to give a developable image of the high lights and half-tones of an engraving, leaving the shadows entirely blank. Probably a second or two would have been ample with the gelatine film. However, five minutes was the exposure chosen, and, with perfectly normal development, this produced very slowly a thin, delicate image, which, when fixed, was the nearest approach to our ideal of uniformity between lights and shadows that we have yet seen. On removing the collodion film, which is easily done by gently rubbing the wet negative with the finger, the image in the high lights is nearly entirely removed, being on the collodion, while the shadows are practically unaffected, being rendered by the gelatine.

Liquid Air.—We have already alluded to the possibility of the production of cheap liquid oxygen through the liquefaction of air process, and quite recently the apparatus for the latter was exhibited at the Royal Institution. It is stated that so simple and cheap is the apparatus and process, that liquid air will be at the disposal of every one requiring it. The process consists in a series of compressions and expansions, the latter cooling the air and supplying fresh means of cooling further quantities. After this process has been carried on for a few minutes, liquid air collects at the nozzle of the apparatus in quantities of seventy or eighty cubic centimetres—say, about three fluid ounces.

Oxidation of Aluminium.—One of the great drawbacks to the use of this metal is its liability to tarnish and lose its brilliancy, unless well lacquered. It is possible that in the future this drawback may be avoided, for, in a recent *séance* of the Paris Academy of Sciences, Mr. Henri Moissan offered a complete explanation of the cause of this "rusting," as it may be termed. He shows that aluminium produced by electrolysis contains metallic sodium to the extent of from one to three per cent. It is easy to see how the presence of this foreign easily oxidisable metal should lead, through electrolytic action, to the destruction of the exposed surfaces.

New Photographic Fields.—*Nature*, in reviewing a series of Christmas cards, says: "The pictures upon the Christmas cards are not gaudy abominations, but attractive reproductions from photographs of bits of scenery; they should remind people of the gifts of science to art, and with the photographic pictures they show what excellent illustrations can now be obtained by photographic processes." This is but another proof of the value of our oft-repeated recommendations to photographers to make a feature of photography in connexion with the coming Christmas season. There are a hundred ways in which it could be utilised, and, in these days of constant complaints of failing business, the business photographer is acting in strict opposition to his own interests if he does not avail himself of them.

Meteor Photographs.—A new species of hunting is promised for the possessors of the smallest cameras, *i.e.*, the hunting and catching of meteors on a photographic plate. The last number of *Nature* has a reproduction of a photograph of a meteor of striking character. Mr. C. P. Butler, of Knightsbridge, was testing a new lens in a quarter-plate camera, and left it pointing to the sky for about ten minutes; when he came to develop the plate, he thought an accident had happened to it, but, on bringing it out to the light, he saw he had secured a meteor track. A few observers, each provided with such a small instrument and working on a prearranged plan, would soon be able to obtain a series of very valuable records, the stars taken at the same time serving to locate the meteorite with greater exactitude than the most skilful eye observations.

The Evolution of Carbon Monoxide by Alkaline Pyrogallol Solution during Absorption of Oxygen.—We have on previous occasions dwelt upon the readiness with which the quality *i.e.*, the percentage of the normal gas present, of oxygen could be ascertained by the use of pyrogallic acid, and in connexion with these remarks a paper of great value has recently been read before the Chemical Society by Professor Clowes, of which we do not hesitate to reproduce the following abstract, for the benefit of compressed oxygen-users.

"It has long been known that under certain conditions carbon monoxide is evolved during the absorption of oxygen by alkaline pyrogallol. When a solution, 100 c. c. of which contains 10 grammes of potassium hydroxide, is used for the absorption of oxygen, it evolves no carbon monoxide until the percentage of oxygen in the gaseous mixture exceeds twenty-eight. The carbon monoxide evolved, however, increases in amount as the percentage of oxygen rises above that limit, until the carbon monoxide finally reaches about six per cent. of the volume of oxygen absorbed.

"The process of estimation of oxygen is rendered perfectly accurate if the carbon monoxide which has been produced during the absorption is removed by means of cuprous chloride solution before the reading is taken.

"Experiments with pyrogallol solution containing larger proportions of potassium hydroxide than that given above proved that the evolution of carbon monoxide may be entirely prevented under all conditions if the potassium hydroxide is present in sufficiently large proportion.

"A solution, 100 c. c. of which contain 10 grammes of pyrogallol and 120 grammes of potassium hydrate, proved perfectly satisfactory in this respect; the weight of pyrogallol may be reduced to 5 grammes in this solution.

"A solution containing eighteen per cent. of quinol (hydroquinone) and twenty-four per cent. of potassium hydroxide absorbed oxygen slowly, but the absorption was complete, and no carbon

"It is therefore evident that serious error may arise in estimating the proportion of oxygen present in a mixture containing only small proportions of other gases, unless the absorbent pyrogallol solution is prepared of suitable strength, or unless the absorption of oxygen is followed by the treatment of the residual gas with cuprous chloride solution."

ON THINGS IN GENERAL.

THE *doyen* of photographic editors, the friend of every struggling photographer, esteemed beyond measure by those who knew him, endeared in the closest manner to those—among whom I am proud to be numbered—who had the privilege of close intimacy with him, our dear old Editor is gone from among us. I have lost a dear friend. The memory of J. Traill Taylor will ever be green as a man and an editor.

But "*Le Roi est mort! Vive le Roi!*" The new king will meet with the heartiest friendship from all his subjects, and will wish me to give my views on "Things in General" at once.

The thought that occurred to me when I read the current number of THE BRITISH JOURNAL OF PHOTOGRAPHY was, that to a student of photography it constituted such a collection of articles and treatises of such high value as to be worthy of being termed monumental. Every page contains most valuable reading, and typifies the progress that is being made. Of those who may not have taken much notice of it, I should like to draw the attention to Mr. Alfred Maskell's paper on some modern developments of the carbon process. To those with the old notion of the non-developableness of carbon prints from the front, this paper will be a surprise; it will also solve what has been a puzzle to many visitors to the Salon, What was the actual process by which some particularly effective prints were produced? The especial advantage appertaining to the new method is the power of imparting individuality to its products. The processes seem fairly simple too, yet not so simple that the photographer has only to "press the button" while some one else "does the rest," a fatal facility belonging to some parts of photographic practice that is ruinous to all possible art progress. With the Artigue paper most of the work is done for the photographer; with the other direct pigment printing he has to do all for himself, which, to my mind, is a most important feature, as tending to separate its producer from the photographic multitude. There is another great advantage in these new modes, in the fact that they do not require reversed negatives. All old carbon workers are very apt to shrink from double transfer carbon printing, as there are apt to be so many slips 'twixt cup and lip before arriving at a perfect non-inverted print in carbon from an ordinary negative. It is often said that it is strange that so few adopt carbon printing, as it is so simple. It is true it is simple, but equally true is it that it is more liable to accident and imperfection than silver printing, though it must be admitted that, once the mechanical difficulties are overcome, the print is sure to be a good one—no failure from imperfect floating of paper, no spoiled prints from toning bath out of order, *et hoc genus omne*.

Mr. Ives's paper on colour screens and Dr. J. M. Eder's comments on the same subject strike an important note. I have no desire to enter into the polemics of the question, so I merely draw attention to the point that these papers emphasise the well-known fact, that the ordinary dry plate is virtually sensitive to all portions of the spectrum; it is the extent of that sensitiveness in comparison with their luminosity where the points of discussion arise, but to those who read simply to acquire knowledge, the subject will present itself in more aspects than one. As to a comparatively safe dark-room screen it tells us much, and, by attending to the indications given, it ought to be possible to produce a screen permitting the greatest illumination with the least actinic action. I may point out that naphthol yellow, otherwise known as Winchester yellow, is volatile when heated, indeed fabrics dyed by its aid have been seen to have their colour gradually dissipated when exposed to full sunlight for a short space of time.

I note that, at the London and Provincial Photographic Association, the Hon. Secretary inquired how it was that of two lenses of the same type the reflected images were more numerous in one than the other? I should be inclined to quote the reply of the philosopher to King Charles of immortal memory in the matter of the fish

globe, "Please your Majesty, I doubt the fact"—not the fact of the disparity of the number of reflections, but the statement of the lenses being anything but nominally of the same type.

To me it offers one of the saddest of photographic episodes that brought before the readers of this JOURNAL last week by "Operator." He has admittedly behaved like a fool in sending his specimens to an unknown destination, So-and-So at a post office, but that does not lessen the turpitude of the receiver. How many an unfortunate operator's chief means of obtaining a livelihood lie in the power to show specimens of his work! What baseness of mind must be the characteristic of these advertising "employers." Even if we allow that often it is the advertiser's own fault in not placing identifying marks on his photographs, and not sending stamps for their return, there yet remains a substratum of swindlers whom to discover and bring to condign punishment would be a most worthy aim of any Photographic Union.

To the Photographers' Copyright Union, of course, such remarks do not apply, their field being one of limited breadth, though infinite extent. They are to be congratulated on their work done, and on their wisdom in broadening their lines. They have discovered swindlers of another class; but, thanks to their efforts, there is a daily diminishing chance of the deeds of these men remaining unpunished. The hardest experience, however, comes when a photograph is pirated by a man who is not worth powder and shot, who would go to the Bankruptcy Court to whitewash himself of costs, and leave the successful suitor to disburse as best he could his own certain hundred or two of pounds of legal expenses.

Mr. Selby's paper, *Carbon Jottings*, is good reading, but, *apropos* of his remarks on Whatman paper, I may give him and other readers a useful tip. It is, to begin with, no light task to coat an imperial sheet of Whatman's N.H.P. paper without special dishes, and it is also easy to get blisters by the inexperienced. I have often used a capital substitute for pictures on twelve or eighteen-inch long sheets. I tried an immense number of kinds, and finally made use of one recommended by a well-known contributor to these pages. I wrote to the maker of a well-known brand of non-pressed writing paper, and got him to supply me with the full-size sheets. It is called "Baskerville Vellum Wove." The sheets have an unpleasant number of water marks, but they form a splendid semi-rough basis for carbon. I need not say that they should first be coated with the usual chrome alum and gelatine.

In concluding my letter, may I be permitted to wish to every reader a Happy Christmas and a successful photographic New Year?

FREE LANCE.

A COMPARISON OF THE SPECTROSCOPIC AND PHOTOGRAPHIC EXAMINATION OF DARK-ROOM ILLUMINATION.

AT the Croydon Microscopical and Natural History Club (Photographic Section) on Friday, the 13th instant, a paper on this subject was given by Mr. J. H. Baldock, F.C.S., and Mr. A. Roods, F.S.I. Mr. R. F. Grundy occupied the chair. The authors stated that they had been engaged for the last three months in getting together materials for their paper, and to this end had collected a number of commercial samples of glass, fabrics, and papers, and had exposed several dozen plates, both slow and rapid, in front of these media, which were illuminated by paraffin, gas, and candle respectively. The authors stated that on October 24, 1895, a paper by Professor Burton appeared in *Photography* on the "Testing of Media for Dark-Room Illumination;" and on November 13, 1895, a communication was made to the Photographic Club by Mr. E. J. Wall on the "Spectroscopic Testing of Glass for Photographic Work." The writer proceeds: "The fact that these papers should, by a curious coincidence, not only follow one another so rapidly, but also be concurrent with our own paper, which embraces both branches of the subject, would seem to indicate a general desire for some definite knowledge on a matter of interest to many photographers. Our results will be found in the table appended to this paper. In the mean while we now give our method of procedure. The lamps used were a triangular paraffin lamp with the flame half an inch high; a D-shaped gas lamp with a single pinhole burner, with the flame two inches high to the extreme point, and a square-shaped candle lamp. These different lamps are referred to in our table as A, B, and C respectively. The distance at which the plates to be exposed were placed was in all cases twelve inches from the medium. The dark slides were marked off in three sections, and the shutter drawn for three minutes at each section, thus giving exposures of three, six, and nine minutes to each section respectively of each plate. The plates after exposure were developed in *total darkness* for ten minutes with the Ilford formula: Pyro-soda developer, containing two grains of pyro, twenty-four grains of carbonate of soda, and half a grain of potassium bromide to the ounce, then rinsed and fixed. Absolute uniformity of *procedure* was thus obtained, the only disturbing influence being the medium employed. The plates used were those we are in the habit of working, *i.e.*, Ilford ordinary and Red label, Imperial and Cadett Lightning, which we considered *slow* enough and *fast* enough for the purpose, and, of course, it goes without saying that, if any particular medium is unsafe for a *slow* plate, it is useless trying it on a *rapid* plate. Orthochromatic (colour-sensitive) plates we have not tried, partly through lack of time, and partly, as we think, it is not altogether necessary, seeing that such plates must of necessity require great care in development. However, we may at some future time try and find out the best medium for them.

No	Medium.	Ordinary plate. Minutes— 3	6	9	Rapid plate. Minutes— 3	6	9	Parts of the Spectrum cut off.
1	Deep flashed ruby glass A	...	...	...	0	0	0	All but the extreme red.
2	Deep flashed ruby glass B	...	...	...	0	0	0	
3	Light flashed ruby glass A	0	0	0				All but the red, and a trace of orange.
4	Light flashed ruby glass B	...	...	...	0	0	0	Some parts of this glass did not cut off quite so much of the orange.
5	Light flashed ruby glass (Mr. Blake's) C	1	2	4				
6	Light flashed ruby glass (club dark room) ...	...	...	...	3	4	5	
7	Deep flashed orange A	1	2	3				Violet, blue, and blue green.
8	,, ,, A	...	...	...	1	2	4	
9	Marion's special A	7	8	9				Violet and part of blue.
10	,, ,, B	1	2	4				
11	Yellow glass A	7	8	9				Violet and blue.
12	Ruby paper C	...	...	...	0	0	0	Same as 1 and 2.
13	Red paper C	...	...	...	0	1	2	Same as 3 and 4.
14	Red leatherette A	0	0	1				
15	,, ,, B	0	0	0				Same as 3 and 4.
16	,, ,, A	...	...	...	1	2	3	
17	,, ,, B	...	...	...	1	2	3	
18	Orange paper (new) C	...	...	...	0	0	1	Same as 3 and 4.
19	Orange paper (old, been exposed to sun and faded) C	2	4	5				Same as 7 and 8.
20	Orange paper C	...	...	...	4	5	6	
21	Orange paper (old, used in lamp about a year) C	...	...	...	2	4	5	
22	Orange paper (Mr. Blake's) C	...	...	...	2	4	5	
23	Orange Christia C	1	2	4				Same as 7 and 8.
24	,, ,, C	...	...	...	8	9	10	
25	Ruby fabric C	2	4	5				
26	,, ,, C	...	...	...	5	6	7	
27	,, ,, A	3	5	6				Violet, blue green, and part of yellow.
27a	,, ,, A	...	...	...	5	6	7	
28	,, ,, B	1	2	4				
28a	,, ,, B	...	...	...	2	4	5	
29	Ruby Christia A	...	...	...	1	2	3	
30	,, ,, B	...	...	...	1	2	3	Same as 3 and 4.
31	,, ,, C	...	...	...	1	2	3	
32	,, ,, C	0	1	2				
33	Canary fabric B	3	4	5				Violet and blue.
34	,, ,, C	3	5	5				
35	,, ,, C	...	...	...	8	9	10	
36	Canary paper C	8	9	10				Violet and part of blue.
37	,, ,, C	...	...	...	7	9	10	
38	Canary paper (Mr. Blake's) C	...	...	...	6	7	8	
39	Mr. Keogh's Rubralux ...	5	6	7				
40	Mr. Keogh's Rubralux ...	...	...	...	5	7	8	

It may, of course, be said, without fear of contradition, that there is *no absolutely safe light*. What is required, and what we have endeavoured to find, is the safest and most agreeable light to work by, and it will be seen from our table that the construction of the lamp and the nature of the flame have a great deal to do with the

question, besides the medium which screens the light from the plate. Thus it will be seen that our B lamp is safer than the A lamp, and safer even than the C lamp; and through the kindness of a friend, Mr. L. G. Keogh, we are enabled to show you the results obtained with a Rubralux lamp, having yellow and red glasses, which can be used either separately or combined, on Cadett Professional and Lightning plates; bad fogging of the plates resulted with these media in every case. Having now referred to the lamps and plates, we next mention the media employed, which comprise deep and light flashed ruby glass, deep and light flashed orange glass, Marion's special orange glass, ruby and orange Christia, ruby fabric, a red fabric known as leatherette, canary fabric, ruby paper, orange paper, and canary paper.

A glance at the table will show which of these is safest, and we may explain here the meaning of the *numbers*. We have taken 0 as representing practically clear glass. This, of course, points to the *safest* medium, while 10, which is the highest number we have taken, represents bad fog, and consequently the least safe medium.

With reference to the spectroscopic examination, we have not very much to say—the table explains itself; but we may remark that, as will be seen, the spectroscopic and photographic results do not always agree very closely. Take, for instance, ruby glass, leatherette, and ruby Christia; these, though giving identical spectroscopic results, do not give identical photographic results. Ruby Christia, too, though not a very safe light, yet has this peculiarity, that its results on rapid plates are *the same*, whichever form of lamp is used; being doubtful of this, we verified it by a triple trial. Again, ruby glass (3 and 4 in table), though photographically safe, yet some of it, *in parts*, would perhaps not be considered as spectroscopically safe. These comparative results we are enabled to show you in the form of forty exposed and developed plates, and also by means of a table spectroscope and a spectrum thrown on the screen by the lantern.

It will thus be seen from the table that the oft-repeated advice "to use a safe light and plenty of it" is not borne out by the results on the plates—for instance, take again ruby Christia and *new* orange paper; these give practically the same result in the spectroscope, but, owing probably to the greater transparency of ruby Christia, the effect on the plate is greater.

It will also be seen, by comparing 18 and 20, that orange paper, *when new*, is a safe light, but it loses its safety after use owing to the fading of the colour. Whether this fading occurs to any extent with *glasses* we have been unable to ascertain, though in the case of orange glass we are disposed to think that this is so, as indicated in the specimens before you; but it is very evident that there is considerable difference in the safety of different samples of ruby glass (see Nos. 4 and 6).

The yellow and orange glasses (see 7 to 11) are not satisfactory, though more pleasant to work with than ruby glass, but with such a lamp as our B are fairly safe, especially the deep orange.

Fabrics and canary yellow papers owe their want of safely (apart from their colour) to pinholes and uneven thickness of the material, and should never be used (especially with rapid plates) with less than two or three thicknesses.

As mentioned in the earlier part of the paper, *no light is really safe*, and it is always advisable to keep the developing dish covered or screened from the light as much as possible, taking it to the light for examination as seldom and for as short a time as possible.

In conclusion, we may state that we have endeavoured to work out our paper solely by experimental means, keeping the *personal equation* entirely in the background, and, in presenting to you to-night the results we have obtained, we do so in the hope that those who have found their plates unexpectedly fogged, and we know there are many such—may be led to trace the effect of its true cause, and provide themselves with a suitable remedy.

LIESEGANG'S COLLODION TRANSFER PAPER.

[Photographic Society of Japan.]

I RECEIVED a circular about Transferotype some time ago, kindly forwarded by the manufacturer, Dr. Liesegang, of Germany. It struck me that, if this paper would work well, it would be most useful, particularly as there have been difficulties in working other papers of a like kind, so I decided to try it, and, if successful, to give my results to the Society. Accordingly, I wrote to Dr. Liesegang on June 17 to forward me some sample packages, and I received these last August.

I have to thank Dr. Liesegang for kindly giving me the chance to show you his "new paper," at the same time I regret that the paper came to hand here very badly discoloured. Besides the transfer paper, Dr. Liesgang sent samples of his famous Aristo paper and his new Li paper; both of these came to hand without the least sign of discolouration. I perceived a smell of glycerine on opening the package of transfer paper, and I think this was the cause of discolouration, as it keeps the paper soft but at the same time keeps it somewhat moist, and the moisture probably atttacks the paper. The paper came by parcel post, so that it had not the protection it would have had in a tin or zinc-lined case. Last year Prof. W. K. Burton imported some carbon tissue without glycerine, and some with glycerine in its composition, and found the kind with glycerine was damaged more quickly than that without, though it kept for some months. If the transfer paper came in an air-tight box it might very likely keep undamaged for some time. It was as much damaged as you see in the case of this sample (paper sent round), but fortunately this discolouration does not interfere much with the prints; on fixing, I found the veil almost disappeared, so that it cannot be observed by transmitted light using the prints as transparencies or lantern slides, though it shows slightly by reflected light using the prints as positives on porcelain or plaques. I do not condemn the paper on account of discolouration, but, on the contrary, I recommend the paper for any kind of transfer work. I only hope that the manufacturers will make it with a less quantity of glycerine, or altogether without it if possible, though perhaps the paper may thus become difficult to manipulate. The paper, in its present form, is so easy to manipulate that, were the difficulties of manipulation increased even two or three times, it would still be not other than easy in the hands of one exercising even moderate care.

The sample slides I am going to show you are made out of this discoloured paper, but I believe that you will find it difficult to imagine that they were printed on such paper, because they are perhaps clearer than slides made on special lantern plates coated with gelatine emulsion. There are many advantages in this paper. It can be inspected during printing, can be toned to any desired shade, is easy to manipulate, and the results are beautiful. As I told you before, the use of this paper is not only to make transfers upon clear glass for making lantern slides, diapositives, &c., but also for ornamenting porcelain, plaques, &c., in fact anything that it is wished should be decorated with a photographic picture. This evening I am going to demonstrate how to transfer this paper, using glass as the support, for making lantern slides. The transfer to other kinds of surface may be done in the same way. After my demonstration there is to be a lantern exhibition of the slides sent from America to this Society. Should there be time, I will show the result of my demonstration on the screen. I send you round a set of lantern slides made by the use of this paper by Mr. Konishi from his own negatives. Here is the paper which has been printed during the day-time. Now I am going to show you, with the assistance of Mr. Konishi, the process of toning and fixing, and then of transferring upon the surface of glass.

The process of transferring recommended by the manufacturer for ordinary transparencies is gone through after toning, fixing, and thoroughly washing, but the toning and fixing may be done either before detaching the film from paper, or after it is fixed on the surface to which it has been transferred. The particular samples I received were damp, and the film came off in the first washing water, so I am going to show you the process of transferring, with the usual order somewhat reversed, that is, the film is detached in the first washing water, and film is toned, fixed, and washed, and after all manipulations is transferred to the glass surface. This mode of transferring is not recommended for ordinary transparencies by the manufacturer, but is recommended in the case of curved surface. I used the separate toning bath recommended by the manufacturer, though there is also a formula for a combined bath. I proceeded thus: First I wash the prints in several changes of water, till the free silver is washed out, during this washing I detach the film from its original support and wash off as much white medium between the paper and film as I can. When the washing is completed the film is transferred to the following toning bath recommended by the manufacturer:—

A.

Water	1500 grains.
Chloride of gold	1 grain.

B.

Water	1500	grains.
Sulphocyanide of ammonia	40	,,
Hypo	3	,,
Glycerine	60	,,

I take equal parts of A and B, and pour A into B, never reversing this order. When it is sufficiently toned, I transfer the proof into the fixing bath without any previous washing. In five or six minutes the prints are completely fixed, when I proceed to wash in clean water. With several changes of water the washing may be finished in a couple of hours. Now the film is put on a piece of glass in lukewarm water, and the back of the film is gently rubbed with a brush to remove all the remaining white stuff. When it is cleared, I fix it on the final support, for which I take a piece of glass to make a transparency.

I make a solution of five grains of gelatine in one litre of water, and maintain the temperature during the process of fixing. The gelatine solution is poured into a bath of convenient size, and this is put into another large-

sized bath into which is poured hot water to keep the gelatine solution warm. Now we put the clean glass into the solution, waiting a little till it becomes of the same temperature as the solution, then we take the film in the solution and raise it out of the bath together with the glass. We lay the glass flat, film side up, and put a clean piece of paper upon it, and squeeze to expel the air. When it is in perfect contact with the glass, it is dried thoroughly in the air.

Mr. Isawa's demonstration was most successful. The films readily left the paper, and were so tough that they went through the subsequent processes without showing any tendency to tear, and without needing any very great care in manipulation. They showed no tendency to curl up either. Several slides produced by the transfer paper were afterwards shown in the lantern, and were declared to be of as good quality as could be wished. Even in the lantern there was no perceptible veil.

K. Isawa.

STEREOSCOPIC PHOTOGRAPHS ON THE SCREEN.

Messrs. Newton & Co., of Fleet-street, who for some time past have been experimenting with the view of perfecting a practicable method of enabling one to view projected binocular transparencies stereoscopically, have at last succeeded in their object, and recently invited us to judge of the effects obtainable.

The system adopted is to colour the two halves of the binocular transparency, the one blue, the other red, and by means of a pair of lanterns to throw the two images on the lantern screen, keeping them more or less perceptibly out of register. The double picture is then viewed through a pair of spectacles, the glasses of which are respectively coloured blue and red. The effect of the red being cut out by the blue, and the blue by the red, is to present to the brain the necessary dissimilarity required.

Some striking results, such as are sure to be popular with lantern audiences, are obtained by this plan — relief, distance, and solidity being suggested with wonderful realism—and with the greatest ease on the part of the observer. In addition to the coloured slides and spectacles, Messrs. Newton also supply diagramatic lantern slides for showing the stereoscopic effect of binocular vision. When viewing these diagrams and moving from one part of the room to another, portions of the diagram seem to project and follow one about.

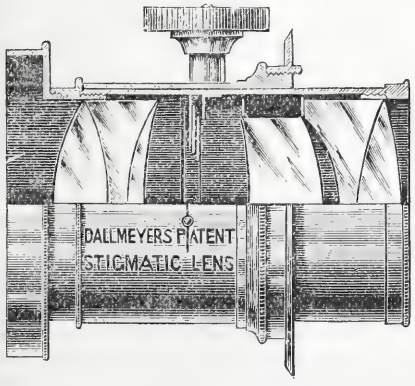
We are informed that this method of stereoscopic projection will be demonstrated before the London and Provincial Photographic Association on Thursday, January 2.

TWO NEW LENSES.

The Dallmeyer "Stigmatic" Lens.

Messrs. J. H. Dallmeyer, Limited, of 25, Newman-street, W., are introducing the Stigmatic portrait lens, Series I., working at *f*-4, of which the following is a description.

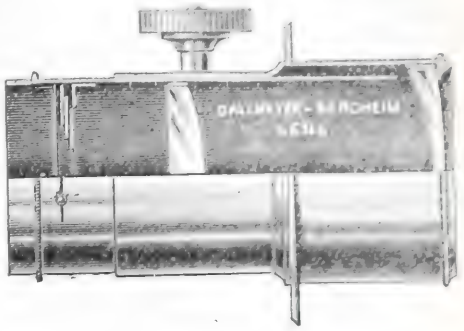
At the full aperture of *f*-4, it is claimed to be absolutely free from spherical aberration, *i.e.*, gives a perfectly defined image. It is non-distorting, and gives a flat field with equal definition from edge to centre, and with but very slight remaining traces of astigmatism. It covers altogether an angle of about 60°—hence it is particularly adapted for short operating rooms. The Stigmatic is composed of two triple combinations, the whole of the glasses used being of exceptionally white and clear quality, and free from mechanical defects. The lens also possesses the same advantage as the "Dallmeyer" portrait-lens system, in that by unscrewing the back cell a turn or part of a turn, a certain amount of spherical aberration is introduced, resulting in more equal distribution of definition over the planes focussed. We are informed that a second series of the Stigmatic working at *f*-6 will shortly be introduced.



The "Dallmeyer-Bergheim" Lens.

The main features of this lens are thus summarised by Messrs. Dallmeyer:—It is constructed to supply a want frequently expressed by photographers who confine themselves to the production of the highest artistic rendering in portraiture, and is based upon some original experiments undertaken by Mr. Bergheim.

It is composed of a single front lens of *positive* focus in combination with a single back lens of *negative* focus, the distances between which are variable, thus arriving at a considerable latitude of focal length. The amount of spherical and chromatic aberration purposely given by the single uncorrected lenses results in a certain amount of diffusion of focus, which produces a softness and delicacy aimed at by Mr. Bergheim himself and other artistic workers. The type of definition given at full aperture is the outcome of a series of experiments, and is such that there is *no destruction of structure* in the resulting image, all detail being given, but softened to an extent that produces a harmonious whole without insisting on critical sharpness. The lens is recommended for large heads and life-size studies, the great amount of depth of focus conducing to a *uniformity* of definition throughout the planes in which the object lies, and obviating an inherent defect in large portrait lenses constructed to give critical definition, in that these have an insufficiency of depth of focus, one plane in the image being very much better defined than the others.



The lenses differ from any hitherto introduced for portraiture, in that they are throughout longer in focus, hence producing more satisfactory perspective. As stated, they are of variable focal length, and that within considerable limits, constructed on the tele-photographic principle, have also *varying covering power*. There is no limit to the size of the image that can be produced, this being merely a question of camera extension, *the same instrument giving images from cabinet to life size.* This lens is free from distortion, and covers the plate with uniform definition from centre to edge.

SOME NOTES ON THE USE OF MODERN SOLUTIONS.

A wonderful revolution has taken place in that highly important and ever-present department of our profession controlled by "developing and toning formulæ." We may not go far afield always in the selection of our main chemicals, but there are, and have been, important modifications during the past few years.

We have been from the very earliest days familiar with stained and unsightly finger tips; but, whereas in years gone by the epidermis was rendered uncanny in appearance, still, so far as I recollect, *appearances only* were the main consideration. Nowadays we have got rid of the "stain" to a great extent, but what there is of it is unfortunately of much more harmful nature.

I don't know, of course, how it may affect the bulk of my professional brethren—those who presumably may be dabbling in these deleterious fluids from one year's end to the other—but I should be much surprised, judging naturally from my own personal experience and observations, if the too free and intimate contact with these "up-to-date" solutions does not lead, firstly, to a semi-paralysis of the digital extremities, certainly to a considerable and very objectionable insensitiveness or impairment of the sense of touch in these parts of the human economy; and, secondly, to a chronic *eczema*.

I should be sorry to frighten any one unnecessarily, but it is my firm belief that these baleful results are distinctly within the bounds of probability, and that it behoves all right-minded persons, with any reverence for their cuticle, to take such measures to ensure a clean whole, and healthy skin as may best fit their business or recreation.

I take it that, no matter how great may be our affection for the old favourite pyro-ammonia, we shall never give up the use of those invaluable reducing agents which have been, so to speak, the building up of the modern photography.

Pyro-ammonia undoubtedly stained the fingers, it produced a deplorable appearance of grime and ingrained dirtiness, but, apart from that, was, I think, quite harmless, and, in fact, may be said to have produced a leathery covering of skin which safely kept other and stronger fluids from acting harmfully upon those parts.

All the harm appears to have come in with the use of alkaline carbonates and fixed alkalies, powerful and pernicious chemicals, which are allowed to come in too free contact with, as I have said, a very sensitive and important part of the hand.

I can imagine that many of those who read this will be inclined to scoff and ridicule the whole argument. Such may be left to their own devices. But one thing may be said, and that is, a man may be *apparently* proof against this poisonous contamination for a considerable time, may imagine himself impervious, but his time may, and in all probability will, come; times, manners, and constitutions change, therefore I say, take precautionary measures

I have myself for a long time considered my skin impregnable to bichromate poisoning, have used the liquid freely from time to time and at intervals; but I have no doubt that the ill effect would have been produced *but* for those *intervals of rest* and cessation from the work. But with the new developing and toning salts, particularly the former, it appears *intervals* of rest and so on are not to be depended upon as a safeguard. I have sometimes gone three or four weeks without any sign appearing of poisonous effect, and, worse still, it may be that even cessation from all photographic work fails to (that is, under some months) thoroughly restore the parts. This *recurrent* effect is naturally very trying. Time, however, and complete abstinence from contact with the fluids, together with reasonable remedial measures, will bring about the normal condition of things.

The precautions, so far as I can see, consist in the use, when developing, toning, &c., of such articles as finger stalls, indiarubber gloves, clips, and plate-lifters—any contrivance, in fact, which will keep the fingers out of the fluids—and the liberal use, after all operations, of warm water and soap, even to the extent of being considered somewhat over-careful. It takes some little time to get thoroughly into the way of these comparatively new and useful appliances. There is always an almost irresistible tendency, when we see a plate or a print getting over-done, to rush in to the rescue; but a little more system, a leisurely, methodical style of working will soon make us at home in the use of any and all of these little aids to a clean and healthy skin.

Taking developing solutions first, I think more use could be made of the bath and dipper. These could be made lighter and fitted to wire supports; they might be made to take two plates at once, and thus we get, by easy stages, to a grooved "*well*" or "tank," in which half a dozen plates can be developed simultaneously. There is no reason, so far as I can see, why plates should not be kept moving or rocking in the vertical as in the horizontal position. Meanwhile, if a tank is used with such method of agitation as will suggest itself to the worker, plate-lifters will be used. They can be easily bent so as to lift and hold the plate vertically.

We have the very thing ready to our hand at a cheap rate in the Bessus plate and film-holders. I don't know that one could make, even if sufficiently skilful, anything cheaper than these. There are, of course, other makes, all of which enable one to develop, fix, and wash and dry the plate without once wetting the fingers. For myself I prefer a flat *tray*, and I have made one measuring seventeen and a half by three and a half inches, which takes four quarter-plates. Little sections of tin soldered on prevent the plates from sliding; they rest on a length of wire, and four small square recesses on each side of the tray, corresponding with the position of the plates enable me to clip and lift out any plate at once. The tray is made of tin, neatly made and soldered, and coated liberally with enamel. Mine is tacked on to a flat board, which is then mounted on two rockers.

I do not care much for finger stalls. If rubber is used, a pair of gloves will be found by far the best. They are awkward at starting, but I now always use a pair *for toning solutions only*. When the prints are toned and in the first washing water prior to fixing, I wash the gloves, still on, with warm water and soap, wipe them and *put them away*. This effectually prevents other people using them. The fixing and washing I invariably leave to another to do.

J. Pike.

HOW TO CHANGE AND DEVELOP THE MOST RAPID DRY PLATES IN AN ORDINARY ROOM.

By J. T. Hackett.

[Written for the Almanac, but received too late.]

I have been altering and enlarging my studio and residence during 1895, which necessitated the pulling down of my dark room, which I was unable to rebuild for some time. I found it most inconvenient to be without a dark room, as I was obliged to change and develop my plates in almost total darkness, at night, as I had no dark-room lamp. At last I thought of and adopted the following plan.

Several years ago I remembered reading in one of the photographic annuals of a photographer who developed his plates under the shadow thrown by a pile of books &c., when a lighted candle or lamp was placed behind them. So I determined to try a modification, and I think an improvement, upon the above plan, which was this: I stretched a wire across a room in a convenient position, about six inches from the ceiling; over this is hung, and fastened, with safety pins or strings, a railway rug, blue or other coloured blanket, quilt, counterpane, or something else equally suitable. Or a six-foot folding screen can be employed instead of the wire &c. Of course, whatever is used must be free from pin or other holes. It must also nearly or quite touch the floor.

On each side of the above screen a table is placed; on one is put the lighted candle or lamp, (without a coloured cover of any kind) and the developing chemicals, which are mixed by the pure light of the candle or lamp, thus avoiding mistakes in mixing the developing solution.

The plates are changed and developed upon the other table, which is in the shadow of the above screen. The screen need not reach from one side of the room to the other, but it must be placed as close as possible to one of the sides of the room so as to avoid stray rays of direct actinic light reaching the plates. It is obvious that it is a very soft grey reflected light that reaches the table on which the plates to be changed and developed are placed, which if the same amount of care and speed in changing the plates, and of keeping the developing dish covered up as much as possible during development, as is usual when working in a dark room, no fear of fogging the most rapid plates is at all likely to take place. I find this greyish light is very pleasant to work with, and an extremely comfortable method of working, especially in cold weather, as any room that happens to have a fire in it can be used by fitting it up temporarily in the same or a similar manner to that described above. For the tourist the plan is of special interest and use, as the work turned out in this manner is quite equal in quality to that done in the best appointed dark room it is possible to make.

Any room or cellar can be fitted and used at night, as above indicated, a great convenience when travelling about.

The top of the screen must not be nearer the ceiling than six inches, nor more than twelve inches, as it is the reflected light from the ceiling and side walls of the room that illuminates the shaded side of the room to the required extent. If a paraffin lamp is employed instead of a candle, it is wise not to turn up the wick too high, as, if it is, the reflected light might be strong enough to fog the plates if care is not taken in this respect. I have never, spoiled any plates by fogging since I began to work as indicated above, and I have used both candles and lamps on different occasions. I intend to work the above system as long as the cold weather lasts, for any work that I can leave to the evening or night to do, as a room in which a fire is burning can be selected for the purpose, in which case the screen is so placed that all direct light from the fire is cut off, as well as that from the candle or lamp. All who try this plan of working, fairly and carefully, will appreciate its effectiveness and comfort, and will never regret trying it.

DRAMATISTS' PHOTOGRAPHY.

By T. C. Hepworth, F.C.S.

[Written for the Almanac, but received too late.]

It is quite natural that the mysteries of photography should occasionally be utilised by those who write plays, as a means of working out their plots. It is also natural that some of these writers should be so ignorant of the actual conditions under which a photograph is produced that they should occasionally fall into grievous error. For your playwright, and your novelist too, is so taken up with his grasp of an idea, that, in his working out thereof, small details escape notice. Perhaps the most flagrant instance of impossible photography is that which occurs in Boucicault's play, *The Octoroon*; but it is more excusable than later sins of the same kind, for the play was written about thirty years ago, when the amateur, as we know him now, was unborn, and when, therefore, the spread of photographic knowledge, such as it is, had not as yet taken place.

In Boucicault's play—we are writing from memory—the scene in which the photographic episode occurs is in the backwoods of America. A little slave boy, who has the care of a bag of letters much wanted by the villain of the piece, is left in temporary charge of a camera, and, as he wants his own portrait taken, he instructs a friendly nigger to uncap the lens, and to run to a certain point and back before recapping it, so as to allow time for the necessary exposure. Although the wet process was the only one available, there was no tent, bottles, or other appurtenances, the dramatist simply waived them; probably he did not know that they were necessary. But to resume our story. While the nigger is absent, the villain enters to slow music, brains the boy, steals the letters, and, with a "Ha! ha! they are mine," sneaks off into the adjacent jungle. Presently the nigger returns, and weeps abundantly when he finds the poor boy minus what little brains he originally possessed. Then, looking round, he thinks he recognises in the camera and its tripod the cause of the tragedy, and smashes it to pieces with an axe. The innocent camera is thus knocked inside out, and is spread in sections over the stage. After a few minutes the good young hero enters, and after hearing the story from the nigger, examines the *débris* of the photographic apparatus. He is suddenly struck with a happy thought. He takes up the sensitive plate—which, being of glass, of course escape the general smash—sees on it the photograph of the murderer in the act of braining the boy; the murderer is tracked and sent to the gallows. As the plate has never seen a silver bath, of course it did not require development—and there you are, don't you know!

Then, about three years ago, there was another play produced in London, in which the hand camera was in constant evidence, and was used as evidence too, of certain acts performed by the *dramatis personæ*. It was used for taking snap-shots in gaslight rooms, and in all sorts of impossible ways. The writer of the play had evidently the most rudi-

mentary knowledge of photography, and had gathered what little he had from the various skilfully constructed anecdotes as to the marvels of detective cameras which occasionally go the round of the London and provincial journals.

The latest instance of dramatists' photography is afforded by Mr. Jerome K. Jerome's successful play at the Garrick Theatre, *The Rise of Dick Halward*. In this case the entire plot turns upon a photographic incident, which we fear we must number among things impossible. Here is the story in brief. The hero, Dick—a briefless barrister—is in love with a heartless flirt, who say she cannot think of marrying less than five thousand a year. Temptation comes in Dick's way, and he yields to it. An old chum in the backwoods of Mexico—how convenient these backwoods are, by the way, to the playwright—occupies his last hours on earth in writing to Dick, sending him a will leaving a fortune to him in trust for a lad whose mother had been wronged by the testator. Dick takes the money, and burns the letter of instructions; so ends Act I. In Act II., Dick is an opulent man, and we find him at a party at the house of the woman he loves. Among the guests is an amateur photographer, who is busy showing his pictures to the others; it is around one of these pictures that much interest centres. It was taken in Mexico where the amateur had been touring, and it represents a man in the last stage of consumption, writing a letter. The photographer prides himself especially on this picture, because it was taken under difficult circumstances, quite unknown to the man whose portrait it contains. Some one remarks upon the perfection of the photograph, and says that it is almost possible in it to decipher the letter in the man's hand. Somebody else suggests that with a microscope it would be quite possible, and, a microscope being at hand, the letter is read aloud for the benefit of the surrounding friends. Such is the story, and it is certainly both ingenious and novel; it, moreover, serves the purpose of the play in leading to the overthrow of guilt. But is the incident photographically possible? The answer must be, No!

In a very sharp negative a letter, written in bold round hand with very black ink on white paper, might be deciphered by the aid of a microscope, if the exposure had been made with that particular object. But in an ordinary portrait negative such fine lines even if brought to a focus would be completely blotted out, the letter representing a dead black surface. But in the case under discussion the lines are written by the shaking hand of a dying man, and we do not suppose that the quality of the ink in the backwoods of Mexico is of a very high standard. Moreover, the friend of Dick Halward has broken and lost the original negative, and the photograph presented to the microscope is a paper print, in which the fibrous nature of the surface would be far more apparent under magnification than any such details as the handwriting on a letter.

This last example of dramatist's photography has raised a wonderful amount of gossip and correspondence in the press, and has probably proved a very good advertisement for the play; and, if it is a little far-fetched, what does it matter? We must not take our playwrights or our novelists too seriously, for, if we did, half the charms of life would be destroyed. In a work of fiction surely a little latitude is allowable, else we might as well begin to dissect all the most valuable traditions of our childhood's happy hours. Who shall dispute the truth of *Jack the Giant-killer*, or *Little Red Riding Hood*, or *Blue Beard?* Are we to doubt them because in these more prosaic days beanstalks do not grow to the clouds, wolves have not the gift of speech, and human hair is not generally of cerulean tint? Such idle thoughts only assail the unemployed, and we may surely leave the author of *Idle Thoughts of an Idle Fellow* to write us many another healthy play like the one under discussion, without asking questions as to probabilities or possibilities.

HOW TO FIND NEGATIVES.

By Ernest C. Fincham.

[Written for the Almanac, but received too late.]

Much time is lost, and patience expended, in what is very often a futile search for some particular negative.

Perhaps an hour, or even more, is wasted by hunting through two or three hundred of one's photographic successes and failures. To obviate this expenditure of time, one would like to suggest a method of indexing that the writer has found very useful.

The pecuniary outlay for the necessary materials is trifling, and is covered by a few pence. Two note books, indexed, are all that one requires. The one contains a numerical, the other an alphabetical, index.

Empty plate boxes are used for storage purposes. Every box should have a gummed label affixed upon the side of the box, each label bearing its own distinctive number. Plate-boxes when filled may be kept ranged on a shelf like so many books. A system of double indexing is used. The numbers, 1, 2, 3, &c., refer to the boxes; under the alphabetical headings are found the titles or subjects of the various pictures. A concrete example will perhaps make my explanation more lucid.

One wishes to find a negative exposed, let us say, in Guernsey. Reference to the letter G in the alphabetical index, shows one that *Mail-boat Approaching Guernsey*, 6.30 *a.m.*, is stored in Box 12. By adopting this method, much time and temper are saved.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

The Sixth Annual Exhibition of the work of the members of the above Society was held at the Technical Institute, West Norwood, from the 3rd to 6th inst., inclusive. The large hall, which had been kindly placed at the disposal of the Committee by the Governors of the Institute, served most admirably to display to advantage the 120 framed exhibits and to accommodate the numerous visitors to the lantern exhibitions which were given each evening.

Lieut.-Colonel J. Gale again acted as Judge, and expressed himself well pleased with the exhibits as a whole. Some of his remarks will apply to many amateur photographers besides the members of the North Surrey. It appears to Colonel Gale that many members were frightened to cloud their landscapes, and preferred plain paper skies; this did not commend itself to his ideas of artistic treatment. Again, he thought, that more time should be devoted to selecting mounts and frames more suitable to the pictures.

Certificates were placed at Colonel Gale's disposal, and he was accorded absolute discretion as to awarding or withholding these.

The result was that certificates were awarded to the following members, viz.—Tom Bright, *A Southdown Pasture*, a very soft and beautiful Sussex landscape; F. Fitz Payne, *Chapter House Door, Rochester Cathedral*, platinum, a fine example of architectural photography; P. Foucard, *Plymouth*, a bromide enlargement; E. Cecil Hertslet, *The Daughter of the House*, a carbon enlargement, recently exhibited at Pall Mall; J. J. Morrish, *Evening in the Val d'Illiez*, a small and pleasing picture, printed in gelatino-chloride, and framed with great taste; R. W. Wilson, *Box Hill*, platinum, a difficult subject with strong contrasts, exposed and printed with great skill and judgment.

Among other members who exhibited, and who elicited high commendation, were Messrs. J. Downes, Russell, Collins, Baldwin, Gibbon, and Waltham.

The Exhibition was fairly well attended, especially in the evenings, when lantern slides formed a special feature. On the opening night, Tuesday, the 3rd, the following members of the Society showed slides:—Messrs. Bright, Baldwin, Dummett, Hertslet, Greswell, Fitz Payne, &c.

On Wednesday evening Major Lysaght, A.P.D., very kindly exhibited to a very appreciative audience a most interesting collection of slides made by him from his negatives taken during a journey through the Low Countries.

On Thursday evening the members and their friends were highly pleased with the set of American lantern slides kindly lent to the North Surrey by the Royal Photographic Society, and on Friday the most successful Exhibition ever held by this Society was closed by a display of the choicest slides of some of its best workers.

WOODFORD PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The members of the Woodford Photographic Society have every reason to be proud of their second annual Exhibition of members' work held at the Club-room, Coffee Tavern, George-lane on Saturday, December 7. The Exhibition was open from five to nine p.m., and more than one expressed regret that the period of opening was of so short duration. It was well attended throughout the evening, in fact at times the room was uncomfortably crowded; still all managed to see, and, from remarks that passed and opinions expressed, all went away well satisfied with what they had seen.

When we consider that the Society numbers among its members such well-known names as Messrs. H. W. Bennett H. Wilmer, H. T. Malby and E. Marriage, it is only natural to expect that the class of exhibits was of a very high order. It would be a rather difficult matter to single out any particular picture as being the best; perhaps Mr. Bennett's *The Choir, Ely Cathedral*, would come up to this standard. Visitors at Pall Mall will know this picture, and we don't think greater praise can be given it when we say that the Royal Photographic Society of Great Britain has chosen this to form part of their permanent collection of pictures. There were others of this gentleman's exhibits that must not be passed over without a word of praise, particularly when we consider that many of them have received honours at various public exhibitions. *A Moonlight Departure* was much appreciated. It represents a yacht sailing away with a good breeze and the moon just coming out from behind a bank of heavy cloud; it is a fine specimen of photography and well deserved the commendation bestowed upon it. *A Stiff Breeze*, *A Race Home*, and *Running before the Wind*, are all in Mr. Bennett's well-known style, and show the same careful treatment. Mr. Noble had five pictures on view, all specimens of one process. Alpha enlargements *An old English Village* and *Eashing Bridge*, were particularly good. They were much admired for their beautifully rich colour and general excellency of workmanship.

Mr. Malby provided as usual a good number of frames, fourteeen in all, and among those were two or three that were hung at Pall Mall. *When woods in early green were dressed.* This together with *Golden Daffodils* are reproduced in "Photograms of 1895."

The Young Musician was much admired for its nice rendering of a somewhat difficult subject. It represents a young lady standing and playing the violin; the attitude is easy and pleasing, the whole pose being

free from any restraint, and the picture had a nice softness and delicacy about it.

Pale Desert Woods was shown in platinum and collodio-chloride, the former being a very fine piece of work. Mr. Marriage, as usual, confined his attentions to architectural subjects—one frame containing a number of platinum prints, 5 × 4, of the capitals of columns of Italian churches, the telo-photo lens had been used in obtaining the negatives. The quaint carvings caused some amusement, but the whole of his exhibits were much admired. Mr. Wilmer's exhibits were confined to photogravures, six in number. *An evening on the North Sea; The Chantry, Bolton Abbey*, and one or two others were on exhibition at Pall Mall lately, so are well known. Of the remaining exhibits much need not be said. Mr. Caird was seen at his best in a bromide enlargement called *A bend in the Roding*, it being a very creditable piece of work Mr. Ember's *Chee Dale-Derbyshire*, is a nice little production in collodio-chloride, this being the best of his ten exhibits, while the Rev. N. R. Fitzpatrick's four enlargements also showed some nice work.

Those who remember the work shown at the last Exhibition cannot but be struck with the advance that has been made during this year just closed. This is all the more noticeable with the work of the younger members. The pictures, viewed either from the technical or artistic standpoint, showed a very high level and give every promise of much beautiful and excellent work in the future.

Our Editorial Table.

Paget Lantern Plates: A Manual for their Use.

By S. Herbert Fry, F.R.P.S. Watford: The Paget Prize Plate Company.

Besides being an excellent guide to the successful use of the Paget lantern plates, this little book contains much information of more general application. Here is the author's definition of a good slide: "A good lantern slide may be said to be one in which the whole of the image is of the most translucent character, in which the colour of deposit is pleasing (this, after all, is a matter of taste), and in which the tone values are proportioned in such a manner as to be suitable to the character of light which comes from the lantern and to the character of the subject-matter of the picture itself." The hints, instructions, and formulæ given in the book are so plain and workmanlike, that by carefully adhering to them the photographer should experience little difficulty in reaching the ideal of quality in a slide as here laid down.

Lehrbuch der Praktischen Photographie.

By Dr. Adolphe Miethe, Honorary Member of the Royal Photographic Society of Great Britain. Halle-a-S.: Wilhelm Knapp.

This work is issued as a guide to those who are studying photography for professional purposes, and it is the author's endeavour to supply a scientific basis to the every-day facts of the principal branches of the art. It is also offered to the professional photographer as a book of reference, and similarly to the amateur who takes a sufficient interest in his hobby. It is a clearly written, comprehensive work, treating of the optics and chemistry of photography, and gives a critical account of apparatus, dark rooms, studios, and fittings. There is a very full description of photographic processes, with formulæ and practical directions, and, in the special chapters on portraiture, landscapes, and interiors, many valuable hints are to be found. The work is worthy of the reputation of its author, and those who read German will find it a valuable text-book.

The American Annual of Photography for 1896.

Edited by W. E. Woodbury. London: Jonathan Fallowfield.

This is a sumptuous volume. Its hundred or more illustrations, chiefly in half-tone, are exceedingly good and well chosen, while in printing and get-up the book would be difficult to surpass. Balagny, Bothamley, Burton, Ives, Chapman Jones, Dr. A. C. Mercer, H. P. Robinson, and Stillman are among the many contributors, and their articles are varied and interesting, in many cases reaching a high level of scientific interest; the formulæ, tables, and allied information have also been well compiled, and both Messrs. Scovill and Mr. Woodbury deserve to be felicitated on the production of their fine annual.

Talks on Pen-and-Ink.

By Elizabeth M. Hallowell. Bradford: Percy Lund & Co.

The authoress, in a series of sixteen chapters and by the aid of numerous explanatory illustrations, leads the reader step by step through the various stages of progress in pen-and-ink work, and well supplies a serviceable guide-book to the rudiments of this method of illustration. We can conceive that many photographers, gifted with a modicum of ability as draughtsmen, would find Miss Hallowell's *brochure* of great tutorial assistance.

News and Notes.

The Woolwich Photographic Society have announced that their Exhibition will be held February 27, 28, and 29 next, and, following the course adopted last year, have decided not to offer any awards.

A correspondent writes: "I see some one has inquired for the indestructible incandescent mantle. They can be obtained either from the Sunlight Incandescent Gas Lamp Company, 79, Queen Victoria-street, E.C., or their agents."

Croydon Art Society.—The Annual Exhibition of the above old-established Society was held at the Public Hall, Croydon, on the 12th inst., when a number of valuable prizes were awarded in fourteen classes. The winner in the class for "the most artistic photograph" was Miss Ella A. Carry, the Judge being Mr. H. Maclean.

It is well known that several members of the Royal Family are enthusiastic amateur photographers. T.R.H. the Princess of Wales, the Duchess of Connaught, and the Duchess of York have recently each accepted a copy of Messrs. Johnson and Chatwood's *Photography, Artistic and Scientific* (Downey & Co.), and have written to the authors, expressing their approval of the work.

The Head Office of War Council of our War Department has fully realised the necessity of photography in war. They have decided to send some of their official photographers to Europe to inspect systems of photography in connexion with War Departments of European countries. Among those dispatched, there is one who was sent over to China during the recent war as a member of the photographic staff.—*Shashin Thowa.*

The Proposed Traill Taylor Memorial.—The following are additiona members of the Committee:—Messrs. J. J. Elliott (Elliott & Fry), W. H. Prestwich, Frederick York, H. W. Bennett, A. F. Mowll (Mowll & Morrison), J. B. Payne (Mawson & Swan), T. Fall, J. A. C. Branfill, Archer Clarke, George Bankart, G. L. Addenbrooke, Birt Acres, Walter Tyler, A. Horsley Hinton, C. A. Rudowsky, T. Sebastian Davis, H. M. Hastings, S. Mosley Massey, and R. Ward. The meeting takes place to-night (Friday) at Anderton's Hotel, Fleet-street, at eight o'clock.

Printing Photographs in Colours.—Mr. Edward R. Hewitt, New York City, has, says the *Scientific American*, devised a method of forming many-coloured photographic prints by applying to a suitable backing a series of superposed films bearing different colours, corresponding approximately with the colours of the object photographed, sensitising the composite film formed of the films of different colours, rendering portions of the film insoluble by exposure to light through a negative, and finally developing the picture by washing with an appropriate solvent.

Barnsley and District Photographic Society.—The Second Annual Exhibition will be held in the Arcade Hall, Barnsley, on Thursday and Friday, January 23 and 24, 1896. Judge, Mr. W. D. Welford. The Open Classes are: A. Lantern Slides (in sets of six); B. Landscapes; C. Figure Studies or *Genre;* D. Hand-camera Work (in sets of six); E. Enlargements (to be accompanied by prints from original negative). Silver and bronze medal as first and second prize respectively in each Open Class. All entry forms, remittances, and letters must be addressed to C. R. Barham, 9, Corporation-street, Barnsley.

Patent News.

The following applications for Patents were made between December 9 and 14:—

Print Washers.—No. 23,638. "Improvements in Print Washers for Photographic Purposes and the like." A. Richard.

Flashlight.—No. 23,718. "An Improved Apparatus for Magnesium Flashlight for Photographic or Stage Purposes." D. Allan.

Tripod Stand.—No. 23,830. "An Improved Tripod Stand for Photographic and other Purposes." E. W. Porter.

Apparatus.—No, 23,836. "Improvements in Photographic Apparatus." B. G. P. Möller.

Cameras.—No. 23,883. "Improvements in Photographic Cameras." Complete specification. H. J. Spratt, A. S. Spratt, and G. A. Spratt.

Lantern Screens.—No. 23,938. "A Mechanical Contrivance for Determining the Angle at which Optical Lantern Screens should be hung." J. Davenport and F. O. Scott.

Printing Frames.—No. 23,939. "Improvements in the Construction of Photographic Printing Frames." O. Linley and F. O. Scott.

Photo-engraving.—No. 24,028. "Improvements Relating to Photo-engraving." F. Sternberg.

PATENTS COMPLETED.

IMPROVEMENT IN PHOTOGRAPHIC DARK SLIDES BY AN APPLIANCE SHOWING AUTOMATICALLY WHEN PLATES THEREIN HAVE BEEN EXPOSED.

No. 21,573. EDWIN ARCHDALE WHITBY, 26, Philpot-lane, City of London.—*November* 9, 1895.

IT relates to photographic apparatus, and consists of improvements in holders for the sensitised plates. The framing of the holder, which is known technically as the "dark slide," is fitted with a movable tablet on which is marked words or signs to indicate whether the shutter of the slide has been drawn accidentally or for exposure of the plate in the camera: Thus, when the sensitised plates are placed in the slide and the same closed, the movable tablet displays the word "unexposed" or the like. The said tablet is, however, so arranged that upon insertion of the slide in the camera and the withdrawal of the shutter, or of the shutter being accidentally drawn, the tablet automatically changes, and the word "exposed" or the like is displayed. The accidental double exposure of any plate is thus obviated.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

December.	Name of Society.	Subject.
23	Camera Club	
23	Lantern Society	
23	North Middlesex	
23	Oxford Camera Club	
23	Richmond	Show of Apparatus.
24	Birmingham Photo. Society	
24	Hackney	
24	Newcastle-on-Tyne & N. Counties	
24	Paisley	
27	Cardiff	
27	Holborn	
27	Maidstone	
27	Swansea	
28	Hull	
28	Leytonstone	Members' Lantern Evening.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 12,—Mr. R. Beckett in the chair.

Mr. MACKIE, in referring to the minutes of the last meeting, where a question as to whether a flare spot had been noticed with the Cooke lens, said one of the claims made on its behalf was its freedom from flare spot.

Mr. J. E. HODD showed and explained a new lantern for use with the incandescent gaslight, bearing, as it did, on a discussion as to the suitability of the same for lanterns at a previous meeting. The light was adjustable backwards and forwards, and the condenser was ventilated by an opening in the jacket. Owing to the low pressure of gas, the whole of the mantle was not illuminated, showing the advisability of a means being provided for centering, which was at present not done. Mr. Hodd would not advise the use of an incandescent light for more than a five-feet screen.

Mr. TEAPE asked if any portion of the mantle was screened from the condenser, but this was not so.

Mr. T. E. FRESHWATER drew attention to the wavering of the illuminated disc, which he thought was common to most incandescent lights, and on trial it was found to be almost overcome by the removal of the mica chimney.

The HON. SECRETARY did not consider the illumination equal to that of the ordinary oil lantern, although the smell was dispensed with.

Mr. HODD showed a patent injector jet (No. 24,761, 1893) for use with gas direct from the main. Although not expected to compete with the mixed jet, he thought it ought to supersede the blow-through type. It burned only about two or three feet of coal gas per hour, and gave an excellent light. It is manufactured by the Manchester Oxygen Company.

The HON. SECRETARY mentioned about a sale of books belonging to the late Mr. Traill Taylor at Stevens's, and said that at a recent meeting of the Affiliation delegates the question of gas bottles was brought forward, remarking that, if the Bill by the County Council goes forward, inconvenience was likely to be caused to societies, owing to the gas bottles having to be placed outside the building, and announced that a sub-committee had been formed to watch the matter. With reference to the question of new quarters, the Committee appointed for the purpose of settling this matter had been offered, and had inspected, a room at the White Swan in Tudor-street (near Anderton's Hotel), and had found it very convenient.

It was proposed by Mr. Mackie, seconded by Mr. Bayston, and carried, that the Secretary be instructed to conclude arrangements with the proprietor for the early occupation of the premises.

The HON. SECRETARY showed a new American developer, which was practically inexhaustible, the action of the sun restoring its energy after use. He also read some correspondence he had had with Messrs. Taylor, Taylor, & Hobson on the subject of the trials of their Cooke lens, recently made and shown at the Association, in which complaint was made that they had not been carried out under strictly fair conditions, various suggestions being given. He denied the unfairness, however, and remarked that they had invited comparisons, and should accept the consequences. His results showed that the circle of illumination was smaller in the case of the Cooke than in that of the Goerz.

The Chairman agreed, and remarked that the Goerz covers much more than that which they are intended for.

PHOTOGRAPHIC CLUB.

THE weekly meeting of the Photographic Club was held on Wednesday, the 11th instant, at the Club-rooms, Anderton's Hotel, Fleet-street, E.C., Mr. F. A. Bridge in the chair.

Mr. Scarborough was duly and unanimously elected a member of the Club.

Mr. Welford handed round examples of the medals given by the Stanley Cycle Club. The medals were of new design and were enamelled upon the obverse. Mr. Welford also passed round a medal such as will be given by the Committee of the Hamburg Exhibition to all exhibitors who are fortunate enough to have their pictures hung. Every exhibitor will thus obtain a medal.

Mr. Cole, of Barnet, exhibited his new patent camera, with special form of rising and falling front. This camera—with its modifications—the inventor believes will entirely obviate the necessity or advantage of the swing back, as ordinarily used. He passed round examples—photographs—which he had made under what he described as adverse or difficult circumstances, and invited discussion upon them.

Mr. Cole was entirely successful in raising an interesting and animated discussion, in which opinions of the most conflicting character were uttered.

In reply to the criticisms of members, Mr. Cole said that any one who wanted it could have a swing back to his camera as well as his patented rising and falling front. He summed up the advantages of his invention as threefold, viz., (1) No vexatious adjustment; (2) Base of camera always level; (3) It places a giant's strength in the hands of the photographer.

The meeting, being an Open Night, then resolved itself into a lantern show of members' slides.

Friends of the Photographic Club and members generally are specially notified that the Ladies' Night is fixed for the second Wednesday in February, and not in January, as erroneously announced in a previous report. There will not be a meeting on Wednesday, 25th instant, Christmas Day.

MANCHESTER PHOTOGRAPHIC SOCIETY.

DECEMBER 12,—Mr. H. M. Whitefield in the chair.

Mr. James Wilde was elected a member.

Mr. Wilde, of the Literary and Philosophical Society, kindly had for inspection of the members an electric arc lamp, by which Mr. Brothers more clearly showed the specimens of two-colour printing exhibited at the last meeting.

Mr. S. L. COULTHURST read a paper on *Hand-camera Work*. [This will appear in our next.]

Several members then gave their experiences as follows:—

Mr. EDWARDES showed his hand camera, which he uses chiefly for landscape work, embodying rising front, bag-changing, an arrangement in the centre of the camera for brushing each plate before the exposure, and a new form of registering exposures.

Mr. A. E. CASSON exhibited his Adelphi camera, fitted with a Goerz lens, the results shown being perfect in covering powers and definition.

Mr. LAWES uses pyro-soda as a developer, and advises tests to be made of the focussing index before using a new camera.

Mr. PEDDIE exhibited his double quarter-plate hand camera for stereoscopic work, with rising front and films in sheaths, which can be used for plates if required. Mr. Peddie exhibited prints of negatives of the lifeboat procession on October 10. Bad light, but well brought out with metol and hydroquinone developer.

Mr. WALKER exhibited a pocket Kodak, and described this, one of the most practicable of small hand cameras.

Mr. WHITEFIELD proved that, theoretically, the correct position of holding the camera was under the chin.

Mr. MELLOR also made a few remarks on the same subject.

After Mr. Coulthurst had briefly replied, there was an exhibition of slides taken with the hand cameras the above gentlemen had described, which concluded a most interesting and instructive evening. Mr. Whittaker manipulated the lantern.

Brixton and Clapham Camera Club.—On December 3 an excellent series of 212 slides by Messrs. F. W. Edwards and Howard Esler, of the South London Photographic Society, were exhibited. They are descriptive of a trip to Scotland, and include views of Dumfries, Edinburgh, Stirling, Glasgow, Ayr, Staffa, and Iona, &c. Especially interesting were the views of the districts associated with Scott's *Lady of the Lake* and with Robert Burns. A number of slides by members were afterwards shown, including promising work by some who exhibited for the first time. Altogether, the Lanternist had a busy time, about 300 slides being passed through the lantern in the course of the evening.

DECEMBER 10, Mr. J. W. Coade (President) in the chair.—A paper on the working of gelatino and collodio-chloride papers was given by Mr. A. WHITTAKER, and was followed by a considerable amount of discussion upon the subject. The prints sent in for the October competition of the *Amateur Photographer* were also exhibited, and met with well-merited appreciation.

Croydon Camera Club.—The meeting on Wednesday, December 4, was devoted to flashlight photography. Mr. J. SMITH advocated and explained the use of the flash lamp for home portraiture, groups, &c., after which he proceeded to take several groups of about twenty of the members present by means of a Hibbert repeating lamp. Subsequently Messrs. Jenkins took several portraits, including one of the President, using the same lamp.

AT a meeting on Wednesday, December 11, a number of prints and enlargements of groups and single-figure portraits, taken at the previous meeting by means of a flashlight lamp, were shown by Messrs. Noaks, Smith, and Jenkins. Several were considerably above the average in their rendering of detail and absence of heavy shadow. The best was a group of four, taken upon an isochromatic plate. The following members showed lantern slides:—Messrs. Beckett, Myrtle, Burn, Lock, and A. J. Noaks, jun., whose series included several unusually artistic examples, and Mr. H. E. Holland, who exhibited a series of South Devon scenes, which, for their colour, subject, and brilliancy, gained well-merited applause. Lantern-slide and an enlargement competition were announced for April; and also that the entries would be judged by Mr. John A. Hodges. Messrs. W. J. Weightman, F. W. Roberts, and W. H. Elliot were elected members.

North Middlesex Photographic Society.—December 9, Mr. Child Bayley in the chair.—Mr. S. H. Bentley was proposed as a member of the Society. Mr. ERNEST BENNETT, the lecturer for the evening, then proceeded to speak on *The Action of Light on the Haloid Salts.* He explained how light acted on a Daguerreotype plate, and showed the difference between that and the wet-collodion process and modern dry plate, inasmuch as the two latter contained an absorbent of the liberated haloid, which the former did not—in the case of the wet plate, the excess of nitrate of silver; and in the dry plate, the gelatine. In the course of the lecture he mentioned that Captain Abney had obtained an image on a collodion film applied to an exposed plate, and then developed. On stripping off the top film, an image was found on both. Speaking of the rapidity of a plate obtained by "cooking," he said that, as the particles of silver bromide increased in size, the light transmitted by a layer of emulsion became richer in blue rays and poorer in red; hence a rapid plate should show a truer rendering of the colour scale. After some discussion and a few questions had been asked and replied to, Mr. BEADLE proposed a vote of thanks to the lecturer, which Mr. WALKER seconded. Some samples of Messrs. Marion's special portrait plates were then distributed, and members were requested to report on them at a future meeting.

Richmond Camera Club.—December 2, Lantern Evening for Members' Slides.—Mr. Ennis occupied the chair, and Mr. Alabaster presided at the lantern. Slides were shown by Messrs. Gibson, Nevill, Watts, Purcell, Child, Baner, Davis, and Hunter.

DECEMBER 9, Mr. Huddy in the chair.—Mr. ARDASEER gave a very interesting lecture and demonstration on *The Making and Use of Collodio-bromide Emulsion.* He showed, step by step, the process of making the collodion, bromising and sensitising it, and explained the mode of evaporating the solvents, and washing and redissolving the "pellicle" before the emulsion is ready for use. The cleaning, edging, and coating of the glass were next demonstrated, and Mr. Ardaseer finished by exposing and developing some lantern plates, coated with his own emulsion, claiming for the process that it gave better results than the gelatine or any other. Mr. WILLIAMS, as an old collodion worker, advised members not to make their own emulsion, but to buy it ready-made, and showed some slides to illustrate the range of tone obtainable with Brooks's emulsion.

Woodford Photographic Society.—December 5, Mr. Malby in the chair.—Mr. Marriage showed four negatives receiving the same exposure, and then cut into quarters and developed differently, with a view to testing the possibilities of altering the gradation by means of development. The result was somewhat in favour of Mr. Watkins' contention. Some remarks were made upon sulphur toning of prints. The final arrangement for the Exhibition of members' work on Saturday, December 7, being settled, the lantern was then brought into use, and about 180 slides were passed through, the best being selected for the public lantern Exhibition on December 12.

Bath Photographic Society.—November 27, Mr. George F. Powell in the chair.—Mr. AUG. F. PERREN explained the sort of apparatus he used for contact and for the reduction methods. He entered into the details of preparing the glass plate, coating and sensitising. A negative was then placed in position and a lantern slide made. This was subsequently finished and shown on the screen by Mr. Appleby, who assisted the lecturer in illustrating his remarks. During the demonstration questions were freely asked and answered, and Mr. Perren promised to take the subject up again at a later date. Mr. Perren afterwards showed a series of slides illustrating an account which he gave of a holiday in the wilds of Galloway, N.B. The slides, which were from photographs taken by himself, were much admired, and included views of Loch Trool—"the Gem of the Lowlands"—where Robert Bruce, in the year 1306, destroyed a force of the English, who had pursued him up the glen, by hurling an avalanche of rocks into the midst of them from the overhanging cliffs. A view was also shown of a secluded spot called "The Caldrons," where in 1685 a party of Covenanters were surprised at their devotions, and cruelly slaughtered by a company of dragoons; the stone commemorating the event was inscribed by "Old Mortality." Mr. Perren then took his audience into the wild and desolate region in which Mr. S. R. Crockett has laid the scene of his popular romance, *The Raiders;* views of Loch Neildricken, "The Murder Hole," Utmost Loch Enoch—nearly 2000 feet above the sea—"The Wolf's Flock," "The Dungeon of Buchan," &c., being included, ending with several slides of the lone farmhouse where he stayed during his visit, the home of the friends whose kind hospitality enabled him to procure many scenes which otherwise would have been difficult of attainment, human habitations being few and very far between in these remote corners of our island.

Bradford Photographic Society.—December 5, Mr. P. R. Salmon in the chair.—Messrs. A. P. RENDELL and J. JACKSON gave an interesting demonstration on *Enlarging.* These two gentlemen are well known to members as expert and careful workmen, and hence it was that the room was crowded. Mr. Jackson took charge of and manipulated his enlarging lantern, in which he used the incandescent gas light, while Mr. Rendell looked to the chemical department. Some excellent 12×10 enlargements were made on Barnet paper, after which many questions were asked.

Leeds Camera Club.—Despite the fact that a miniature gale was raging outside, a huge crowd of members and friends greeted the appearance of the ex-Mayor (Mr. PETER GILSTON) at the Club-rooms, Bond-street, on Thursday, December 5, to deliver his popular and justly celebrated lecture, *A Visit to Rome.* Councillor Green-Hirst was in the chair.—Commencing on board one of our "ocean palaces," the lecturer took his audience through Paris, Cannes, Grasse, to Monaco, his realistic descriptions of the beauties of the Riviera being enhanced by a magnificent series of limelight views, many of which were the results of his own photographic labours. The lavish grandeur of Monte Carlo and its surroundings were depicted upon the screen, and elicited round after round of applause. Passing through Pisa, with its leaning tower and cathedral, the lecturer eventually reached Rome, showing his audience the principal piazzas, the Pantheon, the ruins on the Palatine Hill, and fine views of the temples, Capitol, &c., seen therefrom; the Forum and Coliseum were also shown and described. The numerous subterranean galleries, catacombs, and gruesome burial-places of the ancient Romans were a surprise to many present; but, of course, St. Peter's and the Vatican received the greatest amount of attention. The extreme magnificence of St. Peter's, both architecturally and artistically, was a source of wonderment and delight; the great bronze statue of St. Peter, the bronze canopy and tribune, the Vatican statue gallery, and the Chairamonti corridor being counted amongst the choicest examples of art known. Mr. Gilston possesses the happy knack of combining genuine humour with interesting information and sound moral advice, and his racy anecdotes and ready wit kept his audience in a continual roar of merrriment for over two hours. It is hoped that Mr. Gilston will seize the opportunity offered by his release from municipal duties for a time to make another trip abroad, an account of which is already being looked forward to by many in Leeds.

RUSKIN has said, "A room hung with pictures is a room hung with thoughts," but it is not always the case if the word "photographs" be substituted for "pictures," for photographs are not necessarily pictures, and are often very much otherwise. Mr. W. THOMAS, of the Brixton and Clapham Camera Club, kindly came before the members of this Club on Thursday evening last with a view of showing how photographs could also be made into pictures. "There is no art in photography" is a favourite cry of brush artists, but that this is a popular fallacy was clearly proved Mr. Thomas's able remarks and the superb examples of his own work which he then exhibited. The lecturer, having first explained the general principles and laws of artistic composition, touching upon the rules in regard to lines, the balancing spot, light and shade, contrast and balance, showed in a most practical and lucid manner in what way the most artistic results could be attained, even with the crudest and most commonplace objects. Mr. Thomas is a gold medalist at the Salon and other exhibitions, and the examples of his work brought before the meeting clearly showed that results equal to the best brush artist, and superior to the average products of the medium-rate artists, could be attained. Mr. Thomas is an ardent disciple of the Platinotype process, and he strongly favours the rough Whatman drawing-paper as a mount and a plain black frame with English gold slip. He considers for landscape work generally a simple roller blind shutter is a *sine-quâ-non,* its great advantage being that a much longer exposure can be given to the foreground than to the sky, and thus pleasing cloud effects can be obtained even with prolonged exposures. His remarks riveted the attention of his hearers from start to close, and formed one of the most interesting and practical lectures delivered before the members of this Club, and, doubtless, good results will be shown in the future by those who have heard and profited by his valuable hints.

Liverpool Amateur Photographic Association.—December 5, Mr. J. W. WADE, of Manchester, gave a demonstration of flashlight photography, and photographs of the President and Mr. Lange were taken by his method.

THE Annual General Meeting of this Club was held (by kind permission of the Committee) in the Artists' Club, Eberle-street, on Thursday evening, December 12, the President (Mr. G. B. Newton) in the chair.—Messrs. E. Cookson, C. Gostenhofer, E. E. Simpson, J. H. Glover, and Dr. James Hakes were elected members, and all the hon. members were re-elected. Mr. J. Sirett Brown was elected President for the coming year, Mr. W. Prior Christian and Dr. J. W. Ellis being chosen as Vice-Presidents. The Hon. Treasurer (Mr. P. H. Phillips), was re-elected, as was also the Hon. Secretary, Mr. Fred A. Schierwater. Messrs. G. B. Newton (retiring President), E. V. Swinden, Joseph Earp, E. L. Marriott, E. R. Dibdin, and Dr. Llewellyn Morgan were chosen to fill the six vacancies on the Council. The annual report and Treasurer's account were presented and passed, the latter showing the Club to be, as usual, in a sound financial position. Cordial votes of thanks, which were suitably responded to, were given to the various officers for their services during the past year; also to the Judges in the Society's annual competition. The awards in the competition were next announced, the results being as follows:—Class I., Champion Class, gold medal, M. H. Holt. Class II., Half-plate and under, silver, Dr. Llewellyn Morgan; bronze, Mr. George Allday. Class III., over Half-plate, silver, Mr. John Busby; bronze, Mr. Charles E. Mumford. Class IV., Lantern Slides, silver, Mr. Joseph Earp; bronze, Mr. John Price. Class V., Enlargements, silver, Dr. Edis; bronze, Mr. J. Naylor. Class VI., Stereoscopic Slides, silver, Mr. J. Bushby. Class VII., Hand-camera Work, silver, Mr. J. Bushby. Class VIII., Pictures taken on Society's Excursions, silver, Dr. J. W. Ellis; bronze, Mr. H. Holt. Class IX., Ladies' Competition (President's Prize), silver, Miss C. R. Langton. Class X., Portraits taken in Society's Studio, bronze, Mr. L. Wynne.

EXTRACTS FROM THE ANNUAL REPORT:—"The membership roll at the beginning of the year contained 307 names; the number of new members elected during the year amounted to 36; resignations, lapses, and deaths, 20; leaving 323 names in the books at the end of the year. The Coffee Meetings held on Wednesday afternoons, at four o'clock, continue as popular and well supported as ever, and have become a necessity, as they give the members an opportunity for friendly intercourse, and keep them in touch with one another, in a way that formal meetings cannot do. On the 18th December, 1894, a complimentary dinner was given to Mr. Tyrer, the retiring President. On March 13, 1895, the President gave an 'At Home' in Eberle Hall, which was largely attended, a very enjoyable evening being spent. On March 21 an auction of photographic goods was held, when numerous lots were disposed of. On October 24 a very successful smoking concert was held in the Club-rooms, when members were guests of the President. In May last, Mr. Welch, the late Secretary, was obliged to resign owing to pressure of business, and at a Special General Meeting, held on May 30, the present Secretary was appointed in his place. A handsome silver salver was subscribed for among the members and presented to Mr. Welch, in recognition of the services rendered by him to the Society. It is with deep regret your Council have to record the death of Mr. B. J. Sayce, one of the founders of the Association. Mr. Sayce was a most popular man in the Society, and was known all over the world for his discoveries in connexion with photography. Unfortunately, it was found on his death that his family had been left badly provided for, and a subscription list was

inaugurated by this Society as a testimonial to their late fellow-member's worth. Average daily attendance, forty-one; average attendance at Coffee Meetings, twenty-seven."

Sheffield Photographic Society.—December 3, the President (Mr. Nowill) in the chair.—Two new members were elected, after which Messrs. Hibbert and Furniss gave a practical demonstration on lantern-slide making, the former reducing from half-plate and developing with hydroquinone, the latter printing by contact and developing with pyro-ammonia, magnesium ribbon being used as the illuminant in each case, A discussion ensued as to obtaining warm tones by development only without toning, and a member who is experimenting in this direction promised to give the results of his experiments at a future meeting. A hearty vote of thanks was accorded the demonstrators.

Stockton Photographic Society.—December 2.—Mr. LUBOSCHEZ, representing the Eastman Photographic Materials Company, gave an exhaustive lecture on *The Developing of Platino-bromide Paper*. The audience were delighted with the charming manner in which the lecturer treated his subject, and a unanimous vote of thanks was accorded him.

Photographic Society of Ireland.—November 28, Mr. Leonard R. Strangeways, M.A. (Vice-President), in the chair.—The subject of the evening was "Photographic Topics," and several matters relating to the photographic art were brought forward and freely discussed in an atmosphere laden with redundant fumes and perfumes of nicotine. A very pleasant and interesting evening was spent; the members generally broke the usual rule of silence by taking lively and active part in the proceedings, nearly every one airing his views on the subject of interest to them. Mr. STRANGEWAYS showed the Dallmeyer tele-photo lens and camera, and, in his able, concise, and racy way, tainted with his usual drollness, described their advantages and uses. Mr. ALFRED WERNER demonstrated some experiments he had been making in the direction of flashlight photography, discarding the use of the pneumatic system for that of the elecric fluid as a means for igniting the magnesium. In the first instance he used the spark produced by a Rhumkoff coil supplied by a current from three Obach dry cells. It was found that the spark, about fifteen mm. in length, did not produce the desired result, but, when the terminals were brought into close proximity—about one-eighth of an inch—a red spark and small flame were produced, which immediately ignited the gun-cotton, blitzpulver, or powders used. Mr. Werner then showed an improvement on the above method, by which he dispenses with the use of the coil, taking in its stead an accumulator charged with electricity. He proposed using carbon as the terminals, and as used in the ordinary "arc light," and at all points where the magnesium, of course, was placed. Messrs. Curtis Brothers very kindly lent an accumulator for the occasion. Other subjects afterwards cropped up, such as enlarging, the forms of light used, the style of lenses and condensers, papers, developers, &c. Several members discussed the question of working up enlargements in black and white. While many approved of the system, several others were much against it, and this matter led to the vexed question of art in photography, which terminated in the usual unsatisfactory way, bringing, however, a most successful meeting to a close. Amongst the members who took part in the discussions of the evening we noticed principally the following: Messrs. Ruthven, Strangeways, Inglis, Woodworth, Hargrave, Werner, Keogh, Hoodman, Simpson, and Bewley.

FORTHCOMING EXHIBITIONS.

1895.		
December 20	.....	Blairgowrie and District Photographic Association J. C. Gorrie, Hon. Secretary.
,, 20, 21	.....	*Nottingham Camera Club. W. Edgar, 123, Clinton-terrace, The Park, Nottingham.
1896.		
February 27–29	.....	Woolwich Photographic Society.
March 2–6	.....	*South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
,, 3–6	.....	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

☛ *Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.*

EMULSION FILMS FOR LINE REPRODUCTIONS.

To the EDITORS.

GENTLEMEN,—*Apropos* of your leading article on this subject, in last week's issue, may I make a suggestion as to a means of obtaining greater evenness of image in the lights and shadows respectively, that I have used with some success? It consists of an adaptation of the principle of multiple films. Some two or three years ago in an editorial article a description was given of some experiments with collodion emulsion coated upon ordinary gelatine plates, and from my recollection of the outcome of those experiments—I cannot put my hand on the article for reference—I think it was pointed out that as the higher lights developed upon the slower film they reacted on the underlying quicker film, and either prevented the formation of an image or produced a

It occurred to me to try the method for line work, and it answers the purpose to perfection Where the exposure is sufficient to impress the collodion film, the image is formed on that, and the bromine evolved stops the formation of any image on the gelatine, while where no action takes place on the collodion, the gelatine comes into play. The development is precisely similar to that of an ordinary film, and it is not difficult to adjust the exposure so as to secure a satisfactory result, as the working of the two films one against the other seems to be perfectly automatic. Any exposure between that required by the gelatine film and the longer period necessary for the collodion will produce a picture, but, naturally, there is a happy mean at which the best result will accrue, and this will vary to some extent with every different subject.

The character of the final image is such as you describe as "flat," the density of the lines in the shadows being practically as great as that in the lights, the general strength being dependent upon the exposure, and the relative duty performed by either film, and unless greatly over-exposed the intermediate lines are perfectly clear-cut in the very highest lights.—I am yours, &c. W. B. BOLTON.

PHOSPHORESCENCE OF GELATINE PLATES.

To the EDITORS.

GENTLEMEN,—Could you, or any of your readers, afford me an explanation of the following phenomenon:—

I am in the habit of using Ilford isochromatic plates, and, on a recent occasion, after development with pyro-soda, I was rinsing the plate under the tap, when I was startled by a flash of brilliant light passing over the surface of the film. The light seemed of a phosphorescent nature, judging by the appearance, and seemed to pass to and fro over the film in waves, the phosphorescence sometimes flowing over the fingers. I may say that the phenomenon only appears on a freshly developed plate, and the proximity of the alum bath seems to favour the appearance?

I am not alone in this experience, for a friend living some ten miles from this city tells me he often observes similar bright waves of lambent light on the film after development.

Thanking you in anticipation for any light you may throw on this matter,—I am, yours, &c., EDWARD J. STEER.

22, *St. George's-street, Capetown, November* 14, 1895.

[The phenomenon has often been noted, but no entirely convincing explanation has yet, we believe, been forthcoming. See p. 728 of the JOURNAL for November 15, where Dr. Neuhauss has a note on the same subject.—EDS.]

THE INCANDESCENT GASLIGHT.

To the EDITORS.

GENTLEMEN,—Some time since I saw it stated in your columns that the superiority of an incandescent gas-burner over the oil lamp was only in the colour of the light. My experience of a comparison of the two lights may be interesting. Some six or eight months ago I was asked by a friend to bring my lantern and test the power of the two lights. I had a three-wick lamp—one which I think the best out—(a four-wick lamp I consider a delusion), and prepared it most carefully. The two lanterns were adjusted so as to throw an identical disc about six feet in diameter, and two glass slides were prepared with half of a circular mask mounted on each. I first showed a slide on the screen, to test the lighting, &c., which was pronounced very good, having the slightly warm tint usual to oil-lamp lighting. Next I put in the half disc, which came out quite brilliant. The other lantern was then uncapped and the other half of the disc appeared on the screen, with this result: the half lit by the oil lamp seemed of a light *copper colour*, while the half lit by the Welsbach burner was an intense white with a faint tinge of blue in it. I and my friend were so surprised that we burst out laughing, and I suggested that some trick had been played with my slide. I next put in the slide, which I had first shown—the gaslight being capped off—and this by itself appeared again very good. The *full* light of the gas lantern was now thrown on the screen with the result that my slide was *totally obliterated*, and only the white screen appeared. The amount of candle power necessary to effect this I must leave to experts to calculate.

The mantle used was an "S," with about three-quarters of an inch cut off from the bottom; a forced draught of air being supplied by a small fan.

Some years ago the Welsbach Company brought out a small apparatus for forcing air into the mantle with the gas, but I do not think it was taken to by the public. A small double bellows is quite sufficient to give 150 candle power, and this can be worked if required by the lanternist, with the foot or the left hand, if there is no one who can be pressed into the service.—I am yours, &c., E. HEALY.

Leamington.

ORTHOCHROMATIC PHOTOGRAPHY WITH ORDINARY PLATES

To the EDITORS.

GENTLEMEN,—Since writing my reply (p. 767) to Mr. Punnett (p. 735)

recommended by Dr. H. W. Vogel for colour screens, and which Mr. Punnett says is effective with Seed plates.

I find that, with Seed and other extremely rapid ordinary plates, an aurine screen deep enough to appear a fiery yellow to the eye, yields density curves somewhat similar to those of multiple yellow, as shown in the illustration to my paper, which appeared in your JOURNAL on August 16. I estimate that such a screen would permit at least nineteen-twentieths of the work to be done by dark violet and ultra-violet rays, when used with Seed plates, for ordinary landscape photography. Even with orthochromatic plates there would be so much action by such rays as to make it far less effective than the ordinary yellow glasses. So far as I know, it is the most unsuitable "yellow" that has ever been recommended for colour-screen purposes. If Mr. Punnett thinks that he obtained good orthochromatic results by employing an aurine screen with Seed plates, I must conclude either that he is colour-blind, or else that he does not know the meaning of the word orthochromatic.—I am, yours, &c., F. E. IVES.

London, December 11, 1895.

DENSITY MEASURING.

To the EDITORS.

GENTLEMEN,—Will you please allow me to correct a statement in your report of the paper that I read at the Royal Photographic Society last Tuesday, which does my density-measuring machine an injustice?

You say, "The paper detailed the method of calculating the scale by means of which errors in reading would range from nothing up to five per cent., when only one per cent. of the light was transmitted."

The errors of nothing when one hundred per cent. of the light was transmitted up to five per cent. when one hundredth of the light was transmitted, are the errors that would result if a certain large mistake, taken merely as an illustrative example, were made in estimating the position of the light.—I am, yours, &c., CHAPMAN JONES.

11, *Eaton-rise, Ealing, W., December* 15, 1895.

THE PHARMACY ACT.

To the EDITORS.

GENTLEMEN,—I have read with approval Mr. W. Hume's sensible and temperate letter in your issue of the 6th inst. It calls attention to several real grievances.

As is well known to men of science, methylated spirit adulterated with petroleum is useless for a majority of scientific purposes. In order to obtain spirit of a purer quality, for private use in my own laboratory, I have had to give a bond of 200*l.* to the Excise authorities, and have been put to a good deal of trouble by the ignorant and wooden-headed subordinates of the Department.

But how Mr. Hume could have been fined for buying and selling with metric weights and measures is a thing that passeth all understanding; unless, indeed, the Act of Parliament by which the use of these measures is legalised (27 and 28 Vic. cap. 117, July 29, 1864), does not apply to Scotland.

Mr. Hume was prosecuted a short time ago by the Pharmaceutical Society for styling himself a "technical chemist," and for dealing in "poisons"—that is to say, poisonous chemicals that are not drugs. The Society obtained a sort of Pyrrhic victory; and Mr. Hume is, meantime, restrained from doing either the one or the other.

Were there anything objectionable in Mr. Hume's trade I should be the first to approve of the action of the Society. But the matter is far otherwise. The vast majority of Mr. Hume's customers are students and graduates, in medicine and science, of the University of Edinburgh. It is ridiculous to say that such a trade involves any danger to the public safety. I myself have dealt with Mr. Hume for twenty years. I deal with him because he possesses that knowledge which the seller of drugs does not. If I wrote to Mr. Hume for a mercuric chloride intensifier, I should not receive a mixture of calomel and water, as I did, on one occasion, from the shop of a legally qualified chemist, to whom I administered a severe rebuke for his dangerous ignorance. For if mercuric chloride be calomel, what is to hinder mercurous chloride from becoming corrosive sublimate?

From how many drug-sellers could I procure, at a moment's notice, a bottle of piero-carmine solution, Farrant's solution, Nessler's reagent, properly made solutions for qualitative and volumetric analysis, and dozens of other things of the same sort? How many of them can make up a properly sensitive solution of ammonium molybdate? From how many of them can I even so much as ask for pure nitric acid, sp. gr. 1.5, and be sure that I am not supplied with impure acid, sp. gr. 1.42?

But what is the use of multiplying instances? Just as the seller of drugs is called a "chemist" because he is nothing of the sort, so Mr. Hume is prohibited from calling himself a "technical chemist" because he is one.

As to his trade in "poisons," he is perhaps the last man in the world to whom any one wishing to procure poison for a felonious purpose would dream of going. The vast majority of his customers belong to the highly educated classes. His windows are not decked out with drugs and bottles, but with scientific apparatus, whose use is known only to the initiated. The would-be felon would be much more likely to have to stand a running fire of awkward questions in his shop than in that of the dispensing chemist, where he can purchase a bottle of the highly poisonous quack preparation, chlorodyne, without a question asked.

As to Mr. Hume's photographic trade, it has, I believe, been remarkably successful, because he does not sell rubbish at exorbitant prices. This is probably the reason why interested parties desire to hamper it.

It is very rarely that I mention any tradesman by name in a printed communication. I do so now simply because Mr. Hume's case represents a principle. Guns are hardware, but I do not buy mine from an ironmonger. Nessler's reagent is a chemical substance, but I do not buy mine from a drug-seller. The drug-seller is a most useful man, but he has his limits. *Sutor ne supra crepidam.*

BRYAN CHARLES WALLER, M.D., F.R.C.S. Ed., F.I.C.,
Late Lecturer on Pathology in the School of Medicine, Edinburgh.
Masongill House, Kirkby Lonsdale, December 16, 1895.

ARTIGUE *PAPIER VELOURS.*

To the EDITORS.

GENTLEMEN,—Mr. Maskell's article on the above subject reads very enticingly. Would he be so good as to answer the following:—

1. Where can it be purchased?
2. In what shades of colour?
3. How long will it keep in good working condition after sensitising?
4. What is its speed of printing (by actinometer) compared with autotype carbon tissue—slower or faster?

As a carbon printer of some experience, I should welcome the "direct" method of work, as compared with transfer and hot water.—I am, yours, &c., LUX.

THE JET TRIAL AT THE PHOTOGRAPHIC CLUB.

To the EDITORS.

GENTLEMEN,—Really, Mr. Clay's letter about the report of the jet competition at the Club borders upon the grotesque.

Mr. Clay says, in his second paragraph, that Mr. Scarborough was not a competitor, and, in the last paragraph, that he (Mr. Clay) takes it as an honour to be beaten by two such skilled manipulators as Mr. Wright and Mr. Scarborough. Beaten by a non-competitor is good, excellent—very good indeed.

In his third paragraph he laments that I had not *studied* (italics, please) his original acceptance of Mr. Pringle's challenge in the *Optical Lantern Journal.* No, thanks, Mr. Clay, not that kind of literature.

His next paragraph puzzles me. Mr. Clay is annoyed that he wasted Mr. Wright's time on a fool's errand. Well, gentlemen, why did he send Mr. Wright on his errand?

And, in his final paragraph, Mr. Clay hopes that in future I will make myself conversant with facts. (He doesn't appear to be aware of the fact that the report is not yours at all.) And I hope that one of those facts may prove to be that, in some future competition, Mr. Clay's jet may be the successful one, and that none of the unsuccessful competitors (I suppose they will be competitors if not successful, eh, Mr. Clay?) will write to the press, or threaten to "tell ma," or send people on fool's errands, or any other such proceeding.—I am, yours, &c.,

12, *South-villas, Camden-square, N.W.* S. HERBERT FRY.

P.S.—I am offering a prize to my little girl and boy, aged thirteen and ten years respectively, for the best analysis of the sentence, "I wasted his time on a fool's errand."

To the EDITORS.

GENTLEMEN,—Will you allow me to refer to one or two points in Mr. Lewis Wright's letter published in your issue of a fortnight ago; let me premise by saying that I am quite sure that Mr. Lewis Wright would not knowingly say that which was in the smallest degree misleading or unjust, and anything that falls from him is entitled to the utmost respect and attention.

It was, therefore, not without pain that I read in his letter that this competition was "exploited" for my benefit! So far from this being the case I, as a matter of fact, had nothing whatever to do with it from first to last, and, indeed, was unaware that Mr. Scarborough intended taking part in it; moreover, the jet he used was *not a special one*, and was not even brought to me to test and adjust, but was one of a pair made and supplied by me twelve months ago, and represents my average high pressure jet, and I should have had no difficulty whatever in placing a dozen others of equal power beside it if required.

It is well understood that Mr. Pringle, in the most disinterested manner, initiated this competition, and I can only repeat that I did not concern myself with it, feeling sure that such a competition could scarcely take place without one or more of my jets taking part in it, and I was quite content to let them rest on their merits.—I am, yours, &c.

JOHN OTTWAY (J. Ottway & Son).

178, *St. John Street-road, London, E.C., December* 11.

To the EDITORS.

GENTLEMEN,—I am sorry to have caused so much correspondence, and that some of it needs a few lines more.

Mr. Pringle's letter is what I should have expected of him. I only need repeat that the arrangement was that I might try my jet *after the trial was decided, when my office had come to an end*, and, as an official, I would have had opportunity to explain, in a few words, the experimental and uncompetitive character of the reading I wanted to get, and reasons for wanting it. As I was *not* referee, I put on my jet, but admit that it was an error of judgment, and that it would have been better perhaps to have gone home. But it was a temptation; the jet had been waiting several months by me untested, for want of time and opportunity, and, with the evening gone and the apparatus all there, it seemed a pity not to get the test I wanted.

In reply to Mr. Sinclair, what I objected to was *any one* being described as a "winning jet" under such conditions. He need not suppose me anxious about my own specimen, only in its first crude experimental stage, or that I want to "beat" any body, or that I want to decry Mr. Ottway's, which I know well. But *no other jet was there* which *aimed* at light irrespective of gas except my own, and to state that this only other of mine equalled it was the simplest way of doing justice to other makers, who were not represented on equal terms. I was only there *to be* a referee, though not so, and I feel some little responsibility. Mr. Sinclair is mistaken if he thinks there are not those who occasionally want all the light they can get. I myself do so, and, moreover, my idea, if borne out by further experiment, should give better results with smaller bores also.

The figures, as "collated," will give some readers a bad quarter of an hour; why they were not given just simply passes my comprehension. My jet was not No. 8, which was Mr. Clay's. It was No. 12, and I object to the "collated" figure. The details are: Mr. Scarborough beat me by 1·26 to 1·0. This reading I utterly object to, because I said all along I *could not get coal gas*, nor any light. It ought not to have been called out at all, and, at the very moment it was, the cylinder emptied, and the jet snapped, bursting one of the gauge packings. It is only this reading that gives Mr. Scarborough's any win. The other readings were 1·10 in *my* favour, and two dead heats.

I am sorry for a mistake as to the bores. I gave $\frac{1}{10}$ from memory, as I thought. My bore was really gauged from Mr. Clay's, and when Mr. Scarborough called on me I found that the steel wire, which only goes *stiffly* in mine, goes *loosely* in his; in other words, his bore is really slightly *larger*—only a shade—than both Mr. Clay's and my own. It is over $\frac{1}{16}$. I should describe mine as between $\frac{1}{16}$ and $\frac{1}{15}$, and his as $\frac{1}{15}$. The No. 7 jet in the table is the same jet of mine, but with a much smaller bore on it. I think that when a second has been made, and therewith minor variations tested against each other, and the idea thus brought to its best form, it probably will beat existing jets, "bore for bore." Mr. Scarborough and I—old friends, and not far apart—are quite competent to investigate that point, and hope to do so in due time; but any new pattern in a jet is not perfected in a week, or without competitive experiments, very different from those here in discussion.—I am, yours, &c.,

LEWIS WRIGHT.

REPORTING AT PHOTOGRAPHIC SOCIETIES.

To the EDITORS.

GENTLEMEN,—At the risk of prolonging an unpleasant subject, I must ask you to insert a reply to the last letter of Messrs. Thompson & Co. respecting the exhibition of McKellen's hand camera at one of our monthly meetings.

In their statement of grievance there is a fallacy running through the whole of it. Our Society does not exist for the purpose of advertising anybody's wares; we pay our subscription for the benefit of ourselves, and if it is to outsiders' advantage to send their goods to us for inspection, they must be satisfied with the profit that accrues to them from such inspection, and must not expect us to go to the trouble and expense of a reporter—we formerly employed one, but found it did not pay.

I admit that, if the Society asks through its Secretary for any article from tradesmen, we are bound in honour to show it to the best advantage we can, but not to go to the length of a *verbatim* report. The advertisement columns of your JOURNAL are the proper place when the attention of the public is desired to any commercial article.

We have at our Society a Medes-and-Persian rule that at eight o'clock any subject on the carpet must be shelved, to make way for the principal subject of the evening, which on this occasion was Mr. Wade on "Carbon Printing." Mr. Brothers was on his feet when this time arrived, but had given all the explanation he could, and, putting the camera aside, he said it would be there for any one to see after the paper was disposed of. Later on I saw him wrapping the camera up. I went up to him, saying, "Mr. Brothers, I have not seen that camera, and you promised to let us see it when this carbon business was out of the way." His reply was, "Never mind; you will have a chance of seeing it some other time," and I resumed my seat.

I am not concerned for the correspondent who signs himself "A Member" whom I do not know. Messrs. Brothers and Heywood are both my friends, and I would rather have kept out of this miserable scrimmage as we were all advised by our President at our last meeting; but I am concerned for the honour of our Society, and especially for that of its Secretary. I am one of the oldest of its members, and can say with pleasure that, in Mr. A. E. Casson, we have the most obliging, industrious, and efficient Secretary we have ever had, and I hope our members will all stand up for his reputation, and resent these scurrilous attacks which seem to have no better object than that of saving advertising expenses.

Will you kindly look at your report of the Hackney Photographic meeting (JOURNAL, page 796) and ask yourself whether Messrs. Butchers' are going to have some long drawn-out advertisements—free—in the form of a letter, for it seems to me that they have quite as good grounds for complaint as Messrs. Thompson & Co. have in our case. I do not think they have any, but I mention this as a justification for ourselves.—I am, yours, &c.,

W. BLAKELEY.

Manchester.

To the EDITORS.

GENTLEMEN,—I regret I am compelled to reply to the letter of Messrs. Thompson & Co. in your last issue.

Firstly, let me say I have no animosity whatever against Mr. Brothers, and no one regrets more than I that his name should have been dragged into this matter, and we here in Manchester hold him in high esteem; but Messrs. Thompson & Co. claimed something for him which is not correct, and I had no alternative than writing and putting the matter forward in the way I did. But if in doing so I have given Mr. Brothers pain, I hereby apologise to him for so doing.

To Messrs. Thomson & Co. all I can do is to confirm my previous letter as being correct, at the same time pointing out to them that if they will again read my letter they will find I said, "That the report did ample justice to the description," and not that the report was a full one of all that was said, as they appear to infer or expect, which is impossible on account of space. "It was a pity," they say, "that we did not see the prints sent for show." Perhaps it is, as no doubt we should have learned something from them; however, on reading my JOURNAL on Friday last, and finding what I had missed at the meeting, I took a stroll round the town and along Bull Head-yard, and found Messrs. Thompson & Co.'s and Mr. S. D. McKellen's establishments all in one. Upon looking through the window I saw Thompson & Co. sitting in the middle of the shop, reading a paper—no doubt, it was their own letter in your paper, for their face had a joyful expression. But I looked in vain for the things we had missed at our meeting; what prints I did see (that had been done by this camera) did not inspire me much.

I also like Messrs. Thompson & Co.'s manner in which they introduce the statement that their camera is to revolutionise hand-camera work. You are very bashful, Messrs. Thompson & Co., but you overlook the fact that you must let others prove this, please, and only time will show. You also forget that several hundred hand cameras have been placed upon the market with the same claim (as being the best, &c.) as your own.

Now, as regards holding the camera as stated by them, all I can say is, let them send say 50 to 100 *pictures* taken with their hand camera held up before the face of Mr. McKellen, against my 50 or 100 *pictures* with camera held under the arm or out in front, to three expert hand-camera workers in London, and than we will see which is right; and if I am beaten, I will bow to them, and at the same time come out of my shell.

I regret, Mr. Editor, that I have taken up so much of your space, but I shall have no more letters to send upon this subject, unless they accept my challenge.—I am, yours, &c.,

A MEMBER.

RULES WITHOUT EXCEPTIONS—TO JUNIUS JUNIOR, ESQ.

To the EDITORS.

GENTLEMEN,—You were kind enough some twelve months ago to give me, in these columns, much valuable information on the development of negatives, and on their sometimes curious behaviour during that operation. I have, however, frequently observed their totally abnormal behaviour *after* development, and I know that you will be able to explain it.

I take up one of my choicest negatives and accidently let it fall on the drawing-room carpet. A brush and a dustpan are always necessary to get it together again. I take up a bad one—one that would ruin even my reputation—(I was hung at the *Salon* this year)—throw it in the air as high as I can, letting it drop in the ashpit. It lies there totally undamaged. Shy it against a brick wall, and it will fall to the ground unchipped and smile at me. I have oftened puzzled over these problems; they always work out alike. I know you can explain them. Will you do so?—I am, yours, &c.,

RICHARD.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange six-inch condenser for whole-plate lens.—Address, WARREN, JUN., Albion-street, Leeds.

Wanted, a magic lantern, good make, in exchange for a box of musical glasses.—Address, JOHN R. SINGER, Chippenham.

Will exchange splendid stereo set for enlarging lantern, eight-inch condensers.—Address, COOPER, Photographer, Darlington.

Pneumatic safety bicycle, cost 22*l.* 10s., very little used, in exchange for really high-class half-plate hand camera.—Address, H. SHARPLES, Builth, Wells.

Wanted 12×10 wide-angle rectilinear lens and half-plate set, for massive solid gold albert, nine carat, dog link.—Address, J. JACKSON, 7, Trafalgar-street, Coventry.

Will exchange Dallmeyer's 10×8 view lens, or a large square box camera, one single shutter, or a large portrait lens, by Shepherd, for an enlarging lantern or hand camera, or Dallmeyer's or Ross's cabinet portrait lens.—Address, BANYARD, Melton Hill, Woodbridge, Suffolk.

Wanted, a good 12×15 camera and stand (outdoor); also a first-class enlarging lantern to work from whole-plate negatives. Will exchange for either of the above a first-class safety bicycle, cushion-tyred, all latest improvements.—Address, C. WISBACH, 64, Marine Approach, South Shields.

Wanted whole-plate rapid rectilinear lens of twelve-inch focus; will give exchange from following:—Eight-inch A1 burnisher; large studio camera stand; bamboo whatnot; two wall hoods, each containing four rollers for backgrounds; Morgan's continuous graduated background and stand; wall lantern.—Address, DRINKWATER BUTT, Carlisle.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from 9 to 12 noon.*

PHOTOGRAPH REGISTERED:—

John Stewart, 120, Buchanan-street, Glasgow.—*Three photographs of Rev. Adam Cleghorn Welch.*

H. C.—Thanks; the communication has been forwarded.

IRIS.—Sorry we cannot break our rule against not recommending one maker's goods in preference to another. We have heard good accounts of all four you mention.

W. W. H.—The sulphide of calcium suitable for luminous tablets is supplied by Horne, Cow Cross-street, but whether in so small a quantity as you require we cannot say.

T. H. (Hampstead).—The current as supplied for lighting purposes is unsuited for depositing copper. What is required is a current of large amperage and low voltage. Write to the Company, stating your requirements.

A. JACKSON.—The xylonite dish behaving as it did is not a "phenomenon." It was just what might be expected. Xylonite is soluble in strong alcohol, therefore dishes made of it should not be used for methylated spirit.

J. WATSON.—1. Each of the papers is good, and reliance can be placed on either. We never express an opinion on the relative merits of different makers' goods. 2. The ten-inch focus lens will be the best for general studio work. For small sizes a *carte* lens would be a convenience.

S. W. C.—The subjects would do very well for Christmas and New-year cards—that is, if they were printed in platinum or other process that gives cold tones. Warm reddish-brown tones are very suitable for snow or general winter pictures. We cannot say who would purchase the negatives.

INVESTIGATOR.—1. Nothing is better than glass if it be waxed—then the prints will not stick. 2. Do not curtail the washing. If the paper be good, there will be no frilling. 3. No. 4. The damp weather, provided the paper is kept fairly dry, will not cause frilling. A good sample of paper does not frill.

PYROXYLINE asks: "Will you please inform me in your answers to correspondents where I can obtain a good quality of long-fibre cotton, suitable for making pyroxyline for wet-plate photography?"—Any druggist keeps it in stock. If wanted in large quantities, it may be had from any of the druggists' sundrymen.

WIGAN.—Hunt's *Researches on Light* has been out of print a couple of decades or more. The only chance of obtaining a copy is by advertising for it. A few years ago we met with a copy at a second-hand book-shop for a small sum. The work is, however, very scarce now, and there is no prospect that a fresh edition will be issued.

P. MCA.—You cannot do better than adopt the limelight for the present, using a blow-through jet. With that light you will obtain the greatest possible sharpness in the enlargements. The acetylene light is not yet really practical. If half-plate negatives have to be enlarged from, the condenser must not be less than eight inches diameter.

XENO.—A portrait lens of the Petzval type is not a good form for copying purposes. We should recommend you to use the triplet in preference, although it involves the inconvenience of working with the larger camera. The results will be superior; moreover, the portrait lens is of too short a focus to cover the whole plate perfectly.

A. H. CADE.—If only a few prints are required, say, a thousand or so, the collotype will be the cheapest process; or, if a coarser grain will do, Sprague's process. If large numbers are required, process blocks will be the cheapest. We should recommend that the negatives be taken the full size direct, and not be enlarged from smaller ones.

DEVONIA.—Any good lens will answer your purpose. We should advise you to have Waterhouse stops for the reason you suggest. If the focus (16″) is too short, you will have the next longer, but then the diameter of the lens will be greater, and the cost more. We have not tried lenses by the maker named, so can give no opinion as to their merits.

R. W.—The solution was either made in a dirty bottle, or the water used contained some impurity; otherwise, the gold would not have been precipitated. It will be of no use now for making a "combined bath." A bath made with it might, however, tone, but the tones would be due to sulphur just the same as occurs with the combined bath when no gold is present.

S. A. W.—If the premises were taken on a repairing lease, they must, at its expiration, be left in good repair. Even those portions erected by the tenant—as a studio—must also be left in repair. We should say that if the landlord will accept a reasonable sum, on account of the dilapidations, it had better be paid and thus avoid litigation. There is little doubt that, after so long a tenancy, there are some dilapidations.

W. HALL.—There is no fault with the lens, but with the camera; it does not expand sufficiently for the purpose. It is quite useless trying to copy a print the same size with a lens of ten inches focus, if the camera will not extend beyond eighteen inches. To copy the same size the camera must be twice the length of the equivalent focus of the lens. The only thing to do is to use a shorter focus lens, or a longer camera.

FIXING writes: "1. Is there any objection to use the same fixing bath three or four times? if so, should the same amount of hypo be added each time for strengthening? 2. Do not new or freshly made fixing baths reduce the prints too much, and destroy the tone? Do you know of anything that will prevent this? 3. Is there not another fixing agent equal, or better than, hyposulphite of soda?"—1. The solution should not be used more than once if permanence is a consideration. 2. Not to any extent if the prints are properly toned, and they are from good negatives. 3. No.

P. O. P. asks: "Can you tell me the cause of the yellow spots in the enclosed photograph? The formula used is the Ilford. I never use the combined toning and fixing bath, and it cannot be the mounting solution, because it gets the same spots in the unmounted prints. I take every care in the washing, &c. If you can help me, I shall be glad."—The spots are clearly due to faulty manipulation. Some of them appear as if something had been dropped upon them, and others that air-bubbles had been allowed to adhere to the prints while they were in the fixing solution. Greater care in the operation will avoid them in future.

HERMAN MEYER.—We are sorry we cannot assist you, for the simple reason, that we do not know. English manufacturers keep the formula and the details by which they manufacture their plates to themselves, the same as, we imagine, German manufacturers do. We believe you are quite correct in saying that some of the English brands of plates are much quicker than any that are made on the Continent, but we cannot give the details of their manufacture. We do not think it would be of any good advertising to purchase the formula by which the quickest plates in the English market are prepared, or, at least, for anything like the price suggested.

CONTENTS.

	PAGE
ENLARGEMENTS BY WAY OF ENLARGED TRANSPARENCIES	801
PRACTICAL EXPEDIENTS IN CONNEXION WITH EMULSION FILMS FOR PROCESS WORK	802
ON THINGS IN GENERAL. By FREE LANCE	804
A COMPARISON OF THE SPECTROSCOPIC AND PHOTOGRAPHIC EXAMINATION OF DARK-ROOM ILLUMINATION	805
LIESEGANG'S COLLODION TRANSFER PAPER. By K. ISAWA	806
STEREOSCOPIC PHOTOGRAPHS ON THE SCREEN	807
TWO NEW LENSES	807
SOME NOTES ON THE USE OF MODERN SOLUTIONS. By J. PIKE	807
HOW TO CHANGE AND DEVELOP THE MOST RAPID DRY PLATES IN AN ORDINARY ROOM. By J. T. HACKETT	808
DRAMATISTS' PHOTOGRAPHY. By T. C. HEPWORTH, F.C.S.	808
HOW TO FIND NEGATIVES. By ERNEST C. FINCHAM	809
NORTH SURREY PHOTOGRAPHIC SOCIETY	809
WOODFORD PHOTOGRAPHIC SOCIETY'S EXHIBITION	809
OUR EDITORIAL TABLE	810
NEWS AND NOTES	810
PATENT NEWS	810
MEETINGS OF SOCIETIES	811
FORTHCOMING EXHIBITIONS	813
CORRESPONDENCE	813
EXCHANGE COLUMN	816
ANSWERS TO CORRESPONDENTS	816

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TRANSFERRING FILMS WHILE WET.

Collodion.

We have been asked to extend our remarks on this topic so as to cover wet-collodion work, as many cases arise in which it might be useful, which is so true that it will be worth while to refer to some of the more prominent. Though "process" dry plates are now running the old wet collodion very close, it cannot be doubted — and in this the collodion-manufacturers would bear out our statement—that there is still a considerable amount of work done in which the silver bath plays its old part.

When special signatures, mottoes, or a descriptive title are required to be added to an existing negative, a transferred collodion film is most useful, owing to the absolute transparency that may be given to the groundwork of the lettering, &c. A small collodion negative made in the camera, with a ripe sample of collodion, requires simply to be floated off its support transferred to the required place in the negative—gelatine or otherwise—and the whole allowed to dry, for a negative to be produced, on which, when varnished, it would defy the powers of the keenest critic to discover the presence of anything but the letters or design. If the recipient negative be of collodion, it should first be varnished with ordinary varnish, or coated with hard gelatine.

This same method was once vended as a secret process for introducing backgrounds into portrait negatives. To do this, the film containing the subject to be added is treated with iodine and cyanide in the portion where the figure is to occupy, either before or after transferring. In the latter case, the plate to be improved must be varnished, to prevent action upon its film. We can assure our readers that the plan is an admirable one for the purpose—with the exercise of a little ingenuity, considerable amount of composition can be so introduced. We have seen negatives containing several successive films so attached, each providing its own share to the composition. Of course, the same thing can be done with gelatine films, but they are less amenable to chemical reduction of image; trouble might be apprehended from possible enlargement, and consequent necessary diminution by spirit. Little vignettes at the corners of a portrait or view are easily introduced by these means, and it only needs familiarity with the process to see a hundred different uses in a similar direction to which it may be applied. We have seen it employed very successfully when a negative has been unfortunately produced on a dirty plate, causing silvery fog between film and glass. The danger of this lies in the fragile adhesion that exists in these spots, and, further, in the possibility of the collodion blistering when the varnish is applied to the heated plate. Such films will be quite adherent when applied to a collodionised glass, and the water removed by soaking in methylated spirit before drying the plate.

Finally, when a reversed collodion negative is required, in the absence of a reflecting mirror, for single transfer carbon, or for collotype, or other mechanical work, the power of transferring and reversing the film is most useful. When, for instance, as so often happens in professional work, an old faded collodion or Daguerreotype positive is required to be enlarged, nothing can excel the ease and certainty of wet collodion, which readily gives an image developable up to full printing density, and of a quality hitherto difficult to obtain by any dry plate. The great stumbling-block to printing it in carbon is that the fact of a negative being non-reversed requires the print, if wished for in carbon, to be done by double transfer; this limits the range of surfaces. A double transfer print on rough Whatman, for instance, is next to impossible.

All that is needed is to transfer the collodion film to another glass, but in a reversed position.

The *modus operandi* is simple, and very like that with gelatine; but the film being so much more tender renders great care needful. The first stage is the loosening of the film from the glass. This also, like gelatine, is simply done by flooding the plate with, or immersing it in, an acid solution —almost any acid; we prefer citric acid. If a ten per cent. solution be used, the film should be quite loose in about a quarter of an hour or less, the action being plainly visible by the way the liquid seems to roll under the film. The chief difficulty with collodion films lies in their close adherence at the edge of the plate. To avoid the occurrence of this difficulty it is best to remove a narrow margin of film all round the plate; then, when the action of the acid is complete, the film will float off in the dish of water in which it is placed, and with the utmost gentleness of movement, to avoid any creasing or doubling of the film, which is very likely to happen if any violent movement be imparted to the water. It is easy for the skilled hand to remedy even this mishap; but it is better to avoid it. Collodion films may be transferred to plain glass; but it is better always to use one coated, for example, with collodion washed with water till free from greasiness. The prepared plate is first lowered into the dish of water, and

the film-loosened negative then put in; the dish should be double the size of the plate. If a reversed negative is required the plate whose film has been thus loosened by acid is gently placed, film downwards, into the water, and, when the disturbance has ceased, one end of the plate is slightly raised, and the now bare glass gradually withdrawn by a sort of sliding action. If this is done quietly enough, the film will float without crease. Then the collodionised glass is gently lifted, very slightly on a slant, out of the water, its position being manipulated so as to be exactly under the floating film, and, further, one end of the glass with one side of the film raised above the water. Then the whole must be slowly withdrawn in the same slanting direction.

If it be found that the film is misplaced and a portion hangs over the glass, the process must be gone through again, though it is quite possible with delicate fingering to alter the position of the film on the new support, and without tearing it, so long as there is a pool or layer of water upon it. There is a danger at this stage, if the pool is suddenly drained off, for it to form a sort of pocket in the film, and then to break it open by the weight of the enclosed water. To name this danger is to prevent its happening. The rearing up to dry must not be hurried, or the whole film may slip down in a heap and be spoiled. If there is margin to spare in the transferred film, an excellent plan is to allow a slight portion to overlap the edge of the new glass support, and keep that edge uppermost. Dry-plate workers are not so accustomed as old wet-plate hands to always leave plenty of margin on their negatives, so as to avoid damage to the slight film from various causes. We have only one other defect in transferring to provide against, we refer to the possible inclusion under the film of a bubble of air. This is easily expelled by allowing a thin stream of water to gently dribble from a tap upon the film behind the bubble, and gradually moving the plate under the stream of water, which will push the bubble forward till it makes an exit at the edge of the film.

In conclusion, we may say that the process is far easier in practice than the description may appear on paper. For example, a title may be copied, developed, and transferred, and the negative dried in less than half an hour. We can recommend our readers to try for themselves, and they will be gratified with the ease and simplicity of the process.

DOUBLE-COATED FILMS FOR PROCESS WORK.

Since we mentioned the suggestion of double-coated films last week, we have given a more careful trial to the proposal, and, although the results of our experiments, as made, do not show any improvement, either in exposure or in quality, upon collodion alone, that is most probably due rather to the fact of the separate films not being sufficiently adapted to one another's requirements. Such results as have been obtained are of an interesting character and worth recording.

For the purpose of this trial, an unwashed collodion emulsion of the highest rapidity possible was specially made, and this was used in all the experiments except one, which will be mentioned. The gelatine plates were a commercial sample of good medium rapidity—about 110 Hurter & Driffield—and were selected as being the slowest we had at hand, although it is more than probable that a more satisfactory issue would have been arrived at had a much slower sample been available, as we shall presently show. Such as they are, however, they are, for landscape and ordinary purposes, remarkable for their cleanness in working, and, in that respect, as well suited for line reproductions as any gelatine plates not specially prepared for the purpose. The subject selected for trial was a steel engraving reduced to about half size in the reproduction.

A first trial was made to ascertain the actual rapidity of the collodion emulsion, as well as to establish a standard by which to work, and it was found that, under the conditions of light, lens, and stop, ten minutes' exposure gave about as good a result as might be expected offhand. That is to say, while the general brightness, clearness, and density were all that could be wished, there was room for a little greater strength in the shadow portions. Ten minutes being taken, then, as the normal exposure requisite with that emulsion alone, we proceeded to try how far that time could be reduced, and if with advantage, by utilising the gelatine film as a substratum.

One of the plates mentioned was coated with the collodion emulsion, and, when thoroughly set, soaked in water until the solvents had been removed, rinsed with the contents of a quart jug, and, after draining, placed in the dark slide. The exposure was made in four sections by pushing in the shutter at intervals of 2, 2, 3, and 3 minutes, so that the exposures were respectively 2, 4, 7, and 10 minutes. The choice of developer presented the first difficulty, for, as is well known, the best results on collodion and gelatine films respectively are obtained by very different treatment. However, as the collodion film is the one which will least successfully bear strong development or forcing of any kind and was, moreover, the one that had to stand the chief brunt of the treatment, the development was carried out on collodion lines. A three-grain solution of pyro, from a stock solution preserved with sulphite of soda—4 grains to 1 of pyro—was used, and to each drachm were added at first 2, and finally 2 more minims of a solution containing ten per cent. each of strong ammonia and bromide. This, it will be observed, while a fairly energetic developer for collodion, is not specially so for gelatine, while the small quantity of sulphite present was rather against the latter film on the score of freedom from stain. The development, we may add, was carried out in the ordinary collodion manner, in the hand, without the aid of a dish.

As we fully anticipated, the longer-exposed portions of the plate began to develop as rapidly as an ordinary collodion film, the longest, in fact, having had a full exposure, and the next nearly so; the third section was, however, some little time before it showed signs of commencing, while the two first began rapidly to slacken, and the shortest-exposed end was some three or four minutes without showing any trace of an image. This we found completely to bear out our previously conceived and stated idea of the theory of the working of double films, for, on looking *through* the negative, a faint image was seen to be forming on the gelatine film, though entirely hidden on the surface by the film of collodion. The four minutes' section, too, appeared much denser than its surface aspect led us to suppose it to be, while the other two, in increasing grades, were much more vigorous; but the action was excessively slow, much more so than an ordinary gelatine plate, for which reason we added the additional alkali, although it was running it rather close in the matter of fogging the collodion film. To a slight extent, indeed, this did occur, for we continued developing until there was a very decided veil over the first two sections, although it was not so pronounced on the others.

At this stage we considered it judicious to stop, the surface

ppearance showing a clear, bright image over the better-xposed half, a fairly strong one in the four-minutes' section, nd only a faint, foggy one at the least-exposed end. At the ack matters were reversed, for the two minutes' portion howed the image distinctly, the next more faintly, and the etter-exposed half not at all. By transmitted light, before xing, the whole image seemed to be of fairly equal density, carcely exhibiting any lines of demarcation between the dif-erent exposures, though, after clearing away the unreduced romide, the difference in density was very marked between he sections, though between the lines of the lights and hadows respectively. In the individual sections there was a loser approximation than would have been the case with ollodion alone. The two longest-exposed sections, with this light exception and the addition of an unmistakable gelatine eil, closely resembled a pure collodion image before intensifi-ation.

Another plate was similarly treated, in four different ex-posures, using a washed emulsion, in order to test whether he action of the soluble bromide in the unwashed film exer-ised any retarding action, *per se*, on the underlying gelatine. While it quite proved that such is not the case, it also afforded ther curious evidence of the manner in which the two films work together. In making the exposures, which were the same as in the previous case, we overlooked the fact that the collodion emulsion was a very slow and somewhat thin one, nd would have required probably three times the exposure of he other. But, notwithstanding that there was no free romide present, the development of the gelatine film was ot one whit quicker than in the first instance, and but the slightest trace of an image was visible on the surface. The rogress had to be judged chiefly by transmitted light, and he action was continued until the image was *all* visible at he back, at which stage the surface was evenly veiled to a decided grey.

We may close the account of our experiments before entering upon the conclusions deduced therefrom. The behaviour of the gelatine film in the last case puzzled us, as we should have expected it to assert itself in the absence of any action in the upper film to check it. We therefore exposed one of the same gelatine plates, without the collodion coating, for two minutes, under precisely the same conditions, and developed with the same strength of developer. The result was such as might be expected, an extremely thin-veiled image from over-exposure. Fifteen seconds' exposure under the same conditions as to light and development gave a fairly dense, as well as clear, negative—except for pyro stain—and, in fact, was only faulty from the development not being suitable; but we purposely wished to adhere to the same treatment. Finally, a plate coated with the unwashed emulsion was exposed for fifteen seconds, and on development, which was even longer than in the case of the other coated plates, gave an image far feebler than the uncoated plate, although as much detail was to be found.

The two plates exposed in sections were, after washing and clearing to remove as far as possible the pyro stain, denuded of a strip of the collodion film by drawing the finger with some force the whole length of the surface, and the result revealed some curious and instructive facts. In the first plate, the image on the two best-exposed sections was practically entirely removed, the space previously occupied by masses of the high lights being represented only by a slight yellowish stain, apparently due to the locally hardened film resisting the action of the clearing solution, as the lines of the engraving were undiscernable. In the four minutes' section a faint image remained in the gelatine film, while in the two minutes' exposure, except for the removal of the veil in the collodion, the stripped portion differed in no respect from the rest. Thus, with seven and ten minutes' exposure, we have the whole of the image in the collodion film; in the two minutes it is wholly in the gelatine, and in the four minutes it is divided between the two, but chiefly in the collodion. The second plate, exposed in sections, fully bears out the same principle; but in this case, the longest exposure being far too short for the collodion, the whole of the image on all four sections is entirely in the gelatine, except for a difference in the density of the highest lights only in the stripped and unstripped portions of the longest-exposed sections.

Now, it would seem that, with films of such widely different sensitiveness as those we employed, it is practically impossible to secure any advantageous results. The exposure must be such as to be fairly sufficient for the collodion alone, so that there is no gain in time, and though there may be a more even rendering of the lights and shadows, it is badly discounted by the inevitable gelatine stain, as well as by the apparently equally inevitable collodion fog. It is worthy of note that neither of the collodion emulsions used, as we have proved since by trial, show any tendency to fog under precisely similar conditions *without* the gelatine film, so that it seems very much as if the latter imparts some of the excess of light action to the film above it; and this would lend corroboration to the idea formerly held, that an exposed film would impart some of its action in development to an unexposed film coated on to it after exposure.

Very possibly, too, the necessity for different treatment in development may interfere with the result, though we think, with a slow gelatine film, such as the specially prepared photo-mechanical plates, a more successful issue might accrue. But, then, *cui bono?* Why not use the gelatine film alone? Finally, however, two gelatine films, or a double-coated film from two not very different emulsions, the slower one uppermost, seem to be most likely to realise the theoretical expectations from this combination method.

Photographs of Prisoners.—A little while back we referred to an announcement that the Home Secretary had given notice that, under one of the sections of the Penal Servitude Act, he intended to make new rules for the photographing of prisoners. It is now stated that two portraits of each are, in future, to be taken on the same plate, one showing the full face and the other the exact profile. Henceforth the hands are not to be placed on the breast. This alteration, it is said, has been made on account of the introduction of the anthropometrical system of identification. As we have intimated before, when portraits have to be taken according to fixed rules as to position, the best likeness is frequently sacrificed. In many instances neither direct full face nor exact profile will secure the best likeness of a person. That is well known to every portraitist.

An Interesting Collection.—During the hearing of that amusing case, now before the Bow-street Police-court, against the World's Great Marriage Association (Limited), a detective inspector said he had seized 30,000 portraits. This is a pretty large number of photographs of candidates for connubial bliss. The collection would form a somewhat bulky album, but it would prove a highly interesting one, particularly if appended to the portraits, were the particulars of the sitters as they described themselves to their various correspondents. It is more than doubtful if, in all hydrating properties suggested themselves to me. All who have

cases, the descriptions would tally with the photographs. Whatever may be the end of the World's Great Marriage Association (Limited), it must have done photography a tolerably good turn in absorbing 30,000 portraits, to say nothing of those actually exchanged by the candidates.

Cyanide Poisoning.—In reference to an inquest held one day last week, on the body of a photographer who committed suicide at the Patent Office by taking cyanide of potassium, Dr. Greatorex states, in a daily contemporary, that he said at the inquiry that three grains of cyanide of potassium were sufficient to kill a man, and that the deceased had taken enough to kill fifty men. Three to five grains of cyanide of potassium is, we believe, considered a fatal dose, but this refers to the pure cyanide, and not the material found in the photographic dark room. That salt is very impure, and rarely contains more than thirty per cent. of the cyanide, often much less, the remainder being, for the most part, the carbonate. The pure cyanide, it may be mentioned, is nearly as much per ounce as the commercial salt, as supplied for photographic purposes, is per pound. In his evidence the doctor probably referred to pure cyanide of potassium, not being aware of the kind used in photography.

The Imperial Institute.—At a meeting at the Imperial Institute last week, over which H.R.H. the Prince of Wales presided, Lord Herschell detailed what the Institute had done during the past three years. In opening his address, Lord Herschell said that few questions had been more frequently put to him than "What is the Imperial Institute?—what is the use of it?" The noble lord is not the only one to whom these and similar questions have been put. However, it was claimed that the Institute had been of service, and that it will be still further serviceable in the future. As regards the financial aspect of the affair, it is pretty evident that it might be in a much better condition than it is. Reference was, briefly, made to the fact that a number of Conferences and Exhibitions had been held. If the photographic Exhibition is to be taken as a sample of the others, they are not likely to be repeated in the near future. If at any time the Institute attempts another photographic Exhibition, it is to be hoped that it will profit by the experience it gained by the fiasco of the previous one.

Spots on Prints.—The everlasting question of spots has been cropping up very frequently of late, as it generally does at this season of the year. There are spots and spots, but the form of spots now alluded to are those produced from a cause but little suspected by many, although it has often been alluded to in these columns, namely, from dust of a pernicious nature settling on the prints while they are in a moist state. The dust from coke stoves seems, from some experiments we made some years ago, to be of a highly injurious nature; and there is generally plenty of that about, where coke is burnt, when the stoves are disturbed and the atmosphere is dry. Sometimes these spots make their appearance before the prints are mounted, but, more generally, not till some time afterwards. As a rule, there is no visible nucleus, as that, of course, comes away when the paper is dry, but not before the mischief has been done, although it may be at once manifest. Particles of coke dust are not the only ones that will cause these spots, for several of the things used in the dark room will do the same—bichloride of mercury, for example. A little of its solution spilt on the floor, and allowed to dry, becomes dust when the room is next swept out. If moist prints were always carefully protected from dust and floating particles, we should hear far less of mysterious spots on prints.

WORKING NOTES ON COLLODION EMULSION.

Now that the lantern season is in full swing, my correspondence shows me that a very large number of amateurs employ collodion emulsion in the manufacture of their slides, in spite of the undoubted advantage as regards sensitiveness that gelatine plates possess. As I am unable to deal as fully as I should like with individual difficulties by direct correspondence, I avail myself of this opportunity of treating certain matters which possibly have a general interest for workers of collodion emulsion.

It not unfrequently happens, either from the use of solvents of low grade or from carelessness or mismanagement in the mixing, that an emulsion contains so much water that it refuses altogether to give an even or structureless film, though otherwise of good quality, and consequently becomes perfectly useless, at least for lantern purposes. It should always be borne in mind in compounding an emulsion that, although when newly made it may be just within the boundaries of safety so far as the quantity of water it contains is concerned, every plate that is coated from it brings it nearer to the point at which it will break down; for, as the more volatile contents evaporate, the water present is returned to the stock bottle, and so its proportion gradually, nay, rapidly increases. The emulsion may be thinned with ether and alcohol when it becomes too thick to flow evenly, and if at the outset there has been no more than a fair proportion of water present, this will set matters right; but, on the other hand, when the quantity of water is unusually large, not only does the thickening set in earlier, but it is entirely beyond that simple means of remedy. In the first place, then, I should strongly advise all who make their own emulsions to study real economy by using good solvents in preference to cheap ones.

But, when the evil has arisen, one of the questions put to me is, Can it be remedied by any other means? For one who is regularly making and using emulsion, the simplest plan is to mix the faulty lot with a fresh batch of collodion and resensitise; but, after all, this is only half solving the problem, as, however good the new solvents may be, they are at once degraded by the old emulsion, and, unless the latter be in very small proportion to the former, it will not be long before the trouble recurs. Besides, as the case has been put to me, this plan is useless in cases where only a few ounces of emulsion are used in a whole season. Under such circumstances the following method will be found to answer admirably.

Most of my readers are familiar with the well-known blue crystals of sulphate of copper, but perhaps not all of them are aware that more than one-third of their weight consists of water of crystallisation, which may be driven off by heat, leaving a white salt, which has such a powerful affinity for moisture that it will even abstract water from alcohol, and is, in fact, used for that purpose. The method I propose—not as a mere suggestion, but from practical experience of its ability—is based upon this principle, and the following is the mode of procedure.

Take any quantity of the ordinary blue crystals and pound or crush them not too finely, and place them on an earthenware or tin plate in a fairly hot oven, or on the top of a closed kitchen range until they become perfectly white. Then sift out the dust, or extremely small particles, and they are ready for use, or, if not required at once, should be carefully preserved in a stoppered bottle. If a quantity of these dehydrated crystals be added to a bottle of water-charged emulsion, and shaken up at intervals for an hour or two, the change effected is really wonderful, and the very worst samples that I have ever tried the remedy on have never failed to be restored to working condition. This is scarcely to be wondered at when we consider that an ounce of the hydrated crystals, when dried, will reabsorb nearly three drachms of water before they are restored to their normal condition, and it must be either a very bad case or a considerable bulk of emulsion that requires that quantity of water removed from it. Of course, it must not be supposed that in the course of its action the whole of the salt is completely rehydrated; but as it is practically insoluble in the collodion, a large-enough excess may be used to ensure the removal, if not of the whole, at any rate of by far the greater part of the water contained. Thus a heaped teaspoonful in a three or four-ounce bottle of emulsion will, in a few hours, place it in as perfect condition as if newly prepared from the best solvents.

It may be asked, what are the other effects of the sulphate of copper, if any. Well, amongst these is another useful one, and this, curiously enough, meets another difficulty that has been laid before me, namely, the restoration of a foggy emulsion, and it was in this connexion that I first used the copper treatment before its de-

worked collodion plates are aware of the powerful bleaching action of the cupric chloride and bromide upon the developed image, which by their application is reconverted into chloride or bromide of silver, cuprous chloride or bromide being at the same time deposited partly in the film and partly in the solution. A similar action naturally takes place in the emulsion, when either of these salts is present, by means of which any fog existing there—which consists of silver bromide in a state of incipient or partial reduction—is removed, and the silver salt restored to its pristine and proper condition. For the purpose of preventing and removing fog, bromide and chloride of copper have long been used, and, if employed with judgment, have little, if any, injurious effect on the sensitiveness of the preparation.

Now, when sulphate of copper is added to an unwashed emulsion containing free soluble bromide—*e.g.*, bromide of ammonium—an interchange of elements occurs, bromide of copper and sulphate of ammonia being formed. Therefore, the addition of sulphate of copper—whether in the hydrate or dehydrated condition matters not—to such an emulsion, when it has reached the foggy stage, will rapidly restore it. So far as any injurious effect arising from the formation of the cuprous salt is concerned, I have never been able to detect the slightest difference between such a restored emulsion and one that has never been foggy; but probably the quantity of such sub-salt formed—if any—is so infinitesimally small as to be inappreciable, or, if formed, it is held in solution until removed in washing by the other bromide. At any rate, sulphate of copper forms, in my opinion, a preferable plan for removing fog to the addition of bichromate, with regard to which I agree with one of my correspondents, that unless the film be very thoroughly washed away indeed, it has too serious an effect on sensitiveness. In the case of sulphate of copper, the by-product formed is not nearly so difficult of removal when it has done its duty, while instead of adding more water to the emulsion, as must necessarily be the case with bichromate, it has, or can be made to have, as I have shown, the contrary effect.

So far as an unwashed emulsion is concerned, there is practically no objection to the use of sulphate of copper as a dehydrating agent; but, when we turn to a washed emulsion, I regret to say the case is different, for, although it, of course, serves the purpose of removing the surplus water, it also entirely removes the sensitiveness. The film, in fact, becomes entirely insensitive for all practical purposes until it has been washed; in fact, the emulsion is by its use placed on the same footing as an unwashed one, though as such it is beyond reproach. I was much surprised at this result, and at first attributed it to soluble impurities in the copper salt; but, when, after repeated washings in strong alcohol and ether and re-drying, the desensitising action still remained, I was forced to relinquish that view, and, with it, all hope of any utility in the direction I had hoped. I am now of opinion that a small trace of the sulphate of copper remains in the emulsion, and that this, in conjunction with the bromine, liberated or loosened from the portions of the film acted on by light, destroys the latent image, at the moment th e plate is wetted previous to development, by causing the bromine to recombine. At any rate, I have repeatedly given long exposures in the camera, and, even in broad daylight, applied the developer with no result, and then, after washing the plate and re-exposing for a normal time, developed a perfect negative; but I have never succeeded in getting an image without previous washing. The sulphate of copper is not without its uses, however, in a washed emulsion, as it will both dehydrate it and remove fog, though it at the same time reduces it to the same category as an unwashed one; but, as a foggy emulsion, or one too full of water, is of no use, it is at least some advantage to remove these defects and restore the preparation to a condition in which it is of *some* use. After this treatment, it may be either used in the manner of an unwashed emulsion, or be mixed with a fresh lot and rewashed, as under neither circumstances will the presence of the slight trace of sulphate of copper act deleteriously.

I omitted to say that after the dehydrated salt has done its duty it is easily removed from the emulsion by filtration, and it is to render this operation easier and more certain that I recommend the salt to be crushed not too finely, and to have the dust sifted from it. Comparatively large crystals present a considerable surface for the emulsion to act upon, and if the rehydration be ever so superficial the action appears to be quite sufficient for all practical purposes.

While on the subject of copper salts, I may refer to the subject of toning and intensifying, which seems to trouble a good many collodion workers. It is nearly, if not quite, twenty years since I first introduced the method of intensifying with chloride of copper, followed by redevelopment with alkaline pyro; and about the same time, or shortly after, bromide of copper followed by nitrate of silver was introduced in America; the former plan for ordinary half-tone negatives, the latter chiefly for use with wet-plate reproductions of black and white where very great density is required. Both these methods are available for lantern slides, either for toning or intensifying. For the former purpose the image is bleached and redeveloped by alkaline pyro or such other of the newer developers as will give the tone required, and for this object perhaps the chloride gives a better choice of tones, though the bromide followed by glycin, amidol, or metol gives very fine results. Bromide of copper, followed by nitrate of silver from ten to twenty grains to the ounce can also be used both for toning and intensifying, as with emulsion film it does not give the extreme density and harshness that it does with a wet plate. In the latter the silver image is loosely deposited on the surface of the film, while in the emulsion it is bedded in the collodion and only the surface particles seem to "catch on" to the silver. If too great density be secured the plate is repassed through the fixing bath, when the density is much reduced and a pleasing transparent brown tone left.

Silver intensification and toning still seems to hold the premier place in general esteem, though loud complaints come of the difficulty of sufficiently ensuring the removal of the hypo. Cyanide does not seem to offer any way out of the difficulty, as, besides being slower in action and a nasty thing to leave about, it also seems to take all the "go" out of the image. It seems almost ridiculous to speak of it as a "wrinkle," but, although I have occasionally used it for years, I have never done so regularly, and have never seen it recommended by any one else—I refer to the use of sulphocyanide of ammonium. This fixes almost as rapidly and quite as well as hypo, and is washed out as readily as cyanide, and it has this peculiarity, that, if the fixing or the washing are insufficient, it lets you know in a harmless manner—not as hypo does, by cropping up in the form of stains during intensification. In the case of sulphocyanide, if the solution be not strong enough to carry out all the bromide of silver it has dissolved, it simply deposits it in and on the film in a visible form, and a second application remedies the defect. As the time occupied in washing and fixing a collodion plate only occupies a few seconds, the adoption of this, as I may term it, "safety" fixer seems worth the trouble, even if it does involve a double application.

The sulphocyanides were tried and found wanting as fixing agents for paper prints, but there is little analogy between paper and plates, as, unlike hypo, the sulphocyanides are comparatively or very poor solvents of silver chloride, while they are little short of hypo, and far superior to cyanide when bromide is concerned. Besides, "the proof of the pudding is in the eating," you cannot intensify in comfort after the use of sulphocyanide, which is more than can be said of hypo.

W. B. Bolton.

COLOUR SCREENS IN PRACTICAL PHOTOGRAPHY.

There is perhaps no branch of photography so little understood, or where more mistakes are made by the general body of workers, than in the use of screens in connexion with colour-sensitive plates. I am not, of course, referring to the advanced students in this particular branch of photography, but to the great mass of workers who are striving to improve their work, and are, at present, somewhat bewildered by the apparently conflicting statements made by our leading writers on the subject.

As examples, let us first take a recent article in the Journal in which it is conclusively shown that screens are of little or no value in conjunction with ordinary plates, and place against this Mr. Ives's subsequent contention to the contrary; both are, no doubt, absolutely correct, if read intelligently, one article dealing with practical every day work under ordinary conditions, the other with exceptional and extraordinary conditions for special scientific purposes, which the every-day worker had better leave to Mr. Ives and his fellow-specialists if they value their own peace of mind.

Then we have the commonly made statement, that for general landscape work screens are mostly valuable in spring and autumn, and of little use in summer and winter—a statement, which always tries my patience sorely, as showing great ignorance of the most valuable properties of the screen, and has probably done much to hinder its intelligent use.

The primary object of the screen, whether yellow or green, or a combination of both, is to cut off or reduce the intensely actinic blue and violet rays reflected by, or surrounding, some portion of a subject, which would otherwise act too powerfully before the red, yellow, and green, or less actinic rays of the subject had sufficiently impressed the plate to give their colour value in true proportion, in other words, to bring the chemical rays more nearly into harmony with the visual rays, and thus render the subject more nearly as we see it.

The secondary object of the screen is to penetrate a dull or hazy atmosphere and give brightness and clearness to the negative, which must be taken under unfavourable atmospheric conditions; there are other properties such as reduced liability to halation, &c., but the above are sufficient for the purposes of this article.

So far I have endeavoured to give the briefest possible outline of the primary and secondary objects in using a screen, so that we may consider when it can be used with advantage, and also when it becomes a positive disadvantage.

Every one admits the value of the screen and colour-sensitive plate for the varied tints of spring and autumn, but to my mind they are equally, or even more valuable for reducing the intensely actinic power of the light on a midsummer day, more especially when it is desired to obtain clouds in the negative; not that any screen will render delicate clouds with certainty, but, by reducing their greater actinic power, bring them more nearly into accord with the less actinic parts of the subject, and so improve our chances of rendering them on the same plate; this is also true of strong contrasts generally. Then, in winter, is not the undoubted power of the screen and colour-sensitive plate to penetrate the excessive dullness, and brighten up a landscape generally, a thing to be often desired—nay, more, really indispensable? I maintain stoutly there are as many opportunities for the use of the screen in summer and winter as in spring and autumn.

Now for a few words of warning when the screen should not be used, and in the front rank of such occasions I should place photographing the setting sun, a subject which has probably received more attention than any other, and one that is almost always surrounded with a flood of golden-yellow light, that makes the most perfect natural screen imaginable, far superior to anything we can buy or make; here our screen is entirely unneeded, and, if used, a positive hindrance, adding to the length of exposure unnecessarily, while the subject is naturally evanescent, and thus increasing our difficulties without giving any compensating advantages. Again, in rendering the distance in a landscape, the screen must be used with great caution; its penetrating power is so great that, if used carelessly, the soft hazy atmosphere of the middle and far distance will be lost, and all pictorial effect destroyed; this property of the screen is perhaps the one more than any other that requires careful thought on the part of the worker.

The screen is a valuable, nay, indispensable, adjunct to the colour-sensitive plate in the hands of a worker who will study its properties, and use or discard it in accordance with an intelligent decision as to whether it will help or hinder him in obtaining any particular effect that may be desired; but the worker who fixes it in position for one day's work, and leaves it at home for the next, had better refrain from using it at all.

I intended recording the results of a number of experiments I have made with screens of various kinds and colours, but it would necessarily be rather long, and must therefore stand over for the present.

F. H. Burton.

IRON PROCESSES FOR COPYING DRAWINGS, ETC.

[Leicester and Leicestershire Photographic Society.]

This particular branch of photography, viz., the copying of line drawings, &c., may be new to some of you, and, as a considerable portion of my time is occupied with this work, it occurred to me that the subject might interest you. In the first place, I do not prepare my own paper, as it may now be bought so cheaply that it is not worth the trouble; I will, however, as we proceed, give formulæ, in order that any one interested may, if they choose, make a few experiments.

There are various ways by which plans, tracings, &c., may be copied, and we will first take the

Ferro-prussiate Process,

or white lines on blue ground.

The formula for preparing the paper is as follows:—

A.

Ammonio-citrate of iron	1 part.
Water	5 parts.

B.

Ferridcyanide of potassium	1 part.
Water	4 parts.

Mix for use in equal quantities, and spread on good sized paper by means of a sponge or flat camel's-hair brush.

The operations of printing and developing are as simple as any process.

The face of the tracing is placed next the glass of the printing frame, and the prepared paper is then placed face to the back of the drawing, leaving the paper a little larger than the tracing, in order that the action of light may be watched upon the margin; during the printing, the paper assumes various tints from greenish-blue to olive, and in summer time a print can be obtained in from five to ten minutes.

When the exposure is complete, the copy to be developed is simply placed in cold water and washed until the lines are pure white; it is then hung up to dry (bearing in mind that too much washing will reduce the intensity of the blue), and, should a line or figure require adding, it may easily be done by marking on the copy with a solution of soda and water.

The greatest drawbacks to this process are the length of time in printing, and (owing to the ground being blue) the unsuitability for colouring; but very pleasing pictures may be made from negatives by this process.

I now come to a process which is a great improvement over the last, viz.,

Blue Lines on White Ground,

the formula for which is as follows:—

Citric acid	40 grains.
Perchloride of iron	48 „
Gum arabic	42 „
Water	11 ounces.

I have copies by this process printed no less than sixteen years ago, which are as good now as when first printed, so we may, I think, regard the process as fairly permanent; the copies are also very suitable for colouring and varnishing.

I might just mention that the process was introduced into England by Mr. G. E. Chapman, 69, Victoria-street, Westminster, is still supplied by him, and, to my mind, is the best obtainable.

The prepared paper should be about one inch larger than the tracing, to allow for turning up the edges, which I shall explain presently.

The exposure can only be determined by test slips; these should be placed in the printing frame alongside the tracing to be copied, and should be inserted so as to remain about two-thirds inside and one-third outside the frame; they can then conveniently be drawn out without opening the frame or disturbing the copy.

After a time one of the test slips is drawn out and dipped in a saturated solution of yellow prussiate of potash, and its chemical action watched for about thirty seconds; if the background remain perfectly yellow, and the lines come out dark blue, the exposure has been sufficient.

It is not necessary to develop the copies immediately after exposure, the printing may be done whilst the light is strongest (especially in winter), and development at the close of the day's work, or even the next day.

When the copy is to be developed, place it face downwards on a smooth board, and turn up the edges of the paper about three-quarters of an inch so as to form a sort of tray, doubling the corners over to prevent the solution from getting on the back, which would cause blue stains; now float on the prussiate bath for about thirty seconds, seeing that uniform contact takes place whilst floating on the solution.

Now raise the copy, inclining it to allow the solution to drip off one corner, and notice particularly whether the lines appear to stand in relief; if they do this, and the ground remains yellow, the development may be considered complete.

The copy is then immersed in clean water to check the further

action of the potash, and then placed face upwards in a bath composed of a ten per cent. solution of spirits of salts and water, care being taken that the copy is completely covered with the solution, the surface should then be carefully worked over with a camel's-hair brush, to remove the blue deposit.

It is next placed face upwards in an empty tray and well brushed to remove any blue sediment, being brushed copiously with water both back and front to remove all trace of the acid solution.

Blue stains very often appear on the hands, and may easily be removed by a weak solution of caustic soda.

There is yet another process to which I must draw your attention, and that is Allott & Jones's black line process. The instructions for this process are precisely the same to the end of the prussiate bath, and so for the blue line process.

Immediately upon taking the copy from the prussiate bath, and before washing, float on the bath No. 2 for about five minutes, then drain for another five minutes. Now place the print in a water bath face upwards, flood it with water, and at the same time sponge the surface, to remove as much of the solution as possible.

Next place it in bath No. 3, face upwards, to bleach. This will take from five to ten minutes. Again flood with water, and transfer the copy to the bath No. 4 to fix the image, leaving it there for five minutes. Again wash, and hang up to dry.

There is still another way of copying drawings, &c., and that is by means of the camera. I have very little to say on this subject, except to give you a formula for development, which I saw mentioned in a photographic journal some years ago. It is about the best I have heard of, and I always use it for this class of work. Take:—

Carbonate potassium	360 grains.
Sulphite sodium	360 „
Water	6 ounces.

To each ounce of developer two drachms of this solution, together with thirty minims of the ordinary ten per cent. solution of pyro and ulphite are added.

The method of development found to answer best is to soak the plate first of all in a gallic acid solution (two grains to the ounce) for about half a minute, and then transfer it direct to the developer, where, in about another half a minute, the image begins to appear. Watch carefully, and, when the details in the darkest part of the picture acquire tolerable strength, add five minims of a sixty-grain bromide solution, and proceed until sufficient density is acquired.

With reference to exposure a few words may be said. Though the use of gallic acid does not necessarily lengthen the exposure required, it has been found better to give more than is necessary; thus, if five seconds be sufficient to produce a perfect image under ordinary circumstances, give ten or even fifteen; the result will be quicker development and less necessity for forcing and less chance of fog, &c. Six times the normal exposure has not produced any signs of the plate being overdone; indeed, it seems next to impossible to produce such a result when the gallic acid is employed in the manner described.

Of course, these copies from negatives are best printed in platinotype.

THOS. A. SCOTTON.

PHOTO-CHEMICAL NOTES.

THE ACTION OF HYDROGEN ON GELATINE PLATES.

SOME extremely interesting experiments are described by E. Cohen in the *Zeitschrift für Physikalische Chemie* (xvi. 450–452). It is shown that, if a plate coated with gelatine bromide of silver emulsion be placed in dilute soda solution, to which a little platinic chloride has been added—about two mgrm. to 200 c. c. of the liquid—and into which hydrogen gas is passed, after the gas has passed for from fifteen to twenty hours at the ordinary temerature of the room, the plates darken to an intense black. This blackening takes place whether the plates have been exposed to light or not, and the black compound consists of reduced bromide of silver, and does not contain a trace of platinum. The presence of the platinum salt is an essential condition to the reaction; in the absence of platinum no trace of reaction is visible after fifteen to twenty hours. Moreover, the solution containing the platinum undergoes no change unless hydrogen be passed through it.

SOLDERING ALUMINIUM.

ONE of the greatest aids which can be given to the manufacture of photographic appliances in aluminium is the production of a solder fulfilling the conditions necessary for the class of work to which it is to be applied. The chief *desiderata* in such a solder are low melting point, identity in colour with aluminium, malleability and strength equal to aluminium, and capacity to wet and adhere firmly to the metal in question.

It has been stated more than once in this JOURNAL that satisfactory methods of soldering exist, but the formulæ of the solders employed have, for obvious commercial reasons, been withheld. It is, therefore, worth noticing that, addressing the Franklin Institute, Mr. Joseph Richards gave particulars of a solder for aluminium as the result of two years' experiments in that direction. It is made of 1 part aluminium, 1 part of 10 per cent. phosphor tin, 11 parts zinc, and 20 parts tin. These proportions correspond to the following percentage composition:—

Aluminium	2·38 per cent.
Zinc	26·19 „
Tin	71·19 „
Phosphorus	·24 „

G. E. BROWN, A.I.C.

THE PHOTOGRAPHY OF THE FUTURE.

THAT the future is merely the evolution of the present, and the present of the past, is a truism. It is therefore safe to presume that, as the photography of the present is to that of the past, so will that of the future be to that of the present—only more or less so. Here we have a starting point, and two stages, one of which we can see, the other only imagine; but, as we can trace the progress from starting point to first stage, our imagination, by means of deduction, may be directed in a reasonable manner to trace the progress from first stage to second.

Photography, then, started as an optical and chemical process, pure and simple, and the mechanical nature of that process asserted itself so far beyond the artistic, that the latter might have been correctly described as only latent.

The energy of all those who were attracted to this comparatively new invention was guided towards improvement and simplification, but not of anything other than *the process*. They were evolving the gelatine plate and platinotype printing, on account of the enormously increased convenience and rapidity of the one, and the absolute permanency of the image in the other. Lenses were receiving a vast amount of attention from skilful opticians, stimulated by a new demand for a delicate and fresh variety of an instrument they were already versed in manufacturing for other purposes.

Out of the clumsy box, which formed the early camera, was growing the more refined and convenient handiwork of the cabinet-maker, whose aptitude was, by degrees, applying itself to the production of an apparatus, the use of which should involve the expenditure of less and less time and trouble. In fact, the early photographers and opticians connected with photography, to whom we owe an enormous debt of gratitude, were to the art of painting with light what the great artists colourmen's houses are to the art of painting with pigments. The latter have devoted research and experiment to the discovery of new and beautiful colours, and to rendering more stable those others, the beauty of which, alas! is somewhat fleeting. So, too, what I may be allowed to call the pigments of the photographer, and certainly his tools, have been made and improved by the pioneers of the last fifty years.

Now there seems to be a lull in the progress of the evolution of this side of photography, and has seemed so for some little time past. Is it because of the inferiority of the minds that are applying themselves, or because of any waning of interest, or growth of languor? These suppositions are untenable to any frequenter of exhibitions or, in fact, to any person acquainted with photographic matters. There is the same amount of brain power at work, or more, but it is like other natural forces, which escape at the weakest part, or, in other words, make their influence felt where an opening is most obvious to them. He would be rash indeed who said there is no one thing left to discover in scientific photography; but certainly, as I remarked before, there *is* a lull, which has the effect of closing the outlet in the direction of invention for the time being, and driving the mental activity of men to seek escape for its energy in another way. And what is that convenient outlet through which it may be, and is, usefully employed? The door is opening to the employment of photography as an art, and it is in consequence of purely natural causes, by means of the inexorable march of evolution, that this aspect of what was once a scientific process, and no more, is by degrees forcing itself upon the attention of every one, even of those, who like Mr. Wedmore, see the tendency, only to deny the possibility.

It has been strenuously denied over and over again that a photo-

graph can with any justice be termed a work of art; and it certainly is an interesting fact, as tending at first sight to the proof that this view is a correct one, that the aim of him who aspires to elevate photography to the proud position in question is generally to make his work resemble a photograph as little as possible. For this reason does he print in sepia colour, or Bartolozzi red on rough-grained paper. For this reason even does he adopt a mount on which has been impressed such a mark as would be left by the printing of a hot-plate engraving, which certainly seems as if he wished the origin of his picture to be ascribed to such a process as the signs upon and around it would imply, and not to the camera and lens. Yet, as a matter of fact, does any one ever seriously and deliberately attempt to deceive by these resorts? Of course not. We all know a photograph when we see one, whatever be its style of printing and *tout en emble*, and nobody is sorry when we do. What, then, are the true reasons which lead to this striving to render a thing similar to that which it is not?

In the first place, then, we may take it for granted that there is no desire to obscure the origin, in consequence of an unworthy shame of the means adopted to produce a photographic print—a shame to which a mind, sensitive to the taunt of mechanism, might perhaps be subject. It is, however, in the direction of the nature of these means that we must look for an answer to our question. We must remember that their very "mechanism," so far from being a cause for decrying, is a reason for giving credit and praise to the photographer when he *does* succeed in producing something unconventional and artistic. His materials are surely a thousand times less plastic than those of the painter or etcher. Their efforts in composition are prompted by their taste, instinct, and ability, and the scope of those efforts within these lines is practically free and unlimited. But the photographer, be his taste exquisite, his instinct for the beautiful ever responsive to its touch, his ability supreme, finds himself hampered at every turn. The painter places himself down to transfer to canvas a spot of nature by no means absolutely perfect in pictorial composition; but his facile brush passes over the obnoxious points, omits at the suggestion of his brain to record them at all, and blends the view into one harmonious and soul-inspiring poem, whereas the photographer must take it or leave it, and so perforce makes the best of it, the wonder really being that he ever succeeds in producing anything of a higher nature than a literal impression of feature. Yet he frequently does do better than this. He can at times put poetry, idealism, and individuality into his work, and he likes that work to resemble that of the etcher or engraver, because the resemblance implies that he, the man with his hands tied and his feet "hobbled," has done as well, or almost as well, as the other man in full possession of the use of his artistic limbs. It may be said that, granting all this, still, rough paper and plate mark mounts are but adventitious aids to the effect desired. The answer to which is, such items fit in with the picture itself. You must have your artistic photograph printed and mounted in an artistic manner. Highly glazed paper is inartistic *per se*, and not simply because it is used for photographs. Rough paper is artistic *per se*, and not simply because it is used for water-colour paintings. The materials of the painter, after all, are not his monopoly, a very limited possible use of which is to be strenuously denied to the photographer, or only at the expense of an accusation of slavishly imitating the former. The latter uses them because he finds they lend themselves to artistic effect, which is what he aims at producing. But to lend is not to create, and rough paper and suchlike never did and never will create a picture out of a commonplace photograph pure and simple. The art, the poetry, call it what you will, must be existent to begin with, and it is the duty of the man who loves and desires to elevate his pursuit to make as fitting, pleasurable and harmonious a presentation of it as lies in his power, without a shadow of a suspicion that he is attempting the manufacture of the sham.

The photography of the present has succeeded in creeping up a little way towards the higher art, and there is no reason to suppose that the onward and upward motion is about to cease. What means, however, may be legitimately employed in the work of progress is not at all agreed upon. The question arises, and must be settled, how far may the methods of the user of the brush be combined with those of the user of the lens? To come back a moment to the present, we find the touch of the pencil *upon the negative* allowed to an almost unlimited extent, without any difficulties being raised as to the status of the print. It is the work of photography. But, it seems, we may interfere with and modify the action of light in one place allowedly, but are distinctly forbidden to do so in another. We may retouch a negative as much as we choose; but, as for bringing a pencil or a brush into contact with a print, perish the thought! A writer in the *Studio* last year gave us some very interesting examples of suppression and modification in pictorial photography. I gather from his words that it is legitimate to modify the work of the soulless camera by working upon the back of the negative with a pigment, but we must not add any absolutely new matter to the print. Why not? Because—so virtually says my authority—our photograph must be a "graphic representation, produced by the action of light on a sensitive substance with a lens or no lens." You have doctored your negative. Never mind. You have allowed a final intervention of the action of light so that the *actual positive image* you see on paper is emphatically and wholly its work, whatever may have been the cause of the negative image on the glass. At this rate it would be allowable to use the brush on a print to an unlimited extent, so long as we secured that final intervention of the "action of light" by copying the worked-up print in the camera, making a fresh negative and printing from that. The common cry—apparently feared—that such a picture was not *photography* would then be hushed.

Surely this is straining at the proverbial gnat! If it be wrong to "add any absolutely new matter," it is equally wrong to attempt in any way whatsoever to produce any effect except through the medium of light. Just because we allow the light to complete our work by shining through a piece of glass and decomposing the molecules of some salt deposited on the paper beneath, we are given *carte blanche* to modify or suppress the effect of that same light previously brought about in the camera. We may say, if we like, of the *image impressed upon the paper*, "This printing is done by the action of light," but we cannot truly apply that expression to the production as a photograph, for other means have been active in its genesis. I have laid stress upon this aspect, presented by the article alluded to, at the risk of repeating myself, because I wish to make an attempt to dissipate the misconceptions as to what may and may not be done in the direction of supplementing the action of light, and to clear the ground of what I venture to think are inconsistencies, hampering the progress of the photography of the future. It is desired to make it less mechanical. To mask out portions of a negative and print a dozen copies therefrom is surely more mechanical than to work upon the individual prints, which consequently will probably differ one from another more or less. "Ah, but, then, that is not photography!" I remember these words were applied by nearly the whole photographic press to a gem resembling a mezzotint in a Pall Mall Exhibition a few years back. And why? Simply because the high lights on the water and the reeds in the foreground had been touched with the brush. The good people who attempt to destroy with such a cry, should ask themselves, what is it if not photography? Anything lower, or anything higher? Granted it is *not* photography, wherein lies the sting? It is better, it is higher art than unmitigated photography. It is the product of light, plus the adroit touch of a hand moved by brain. It bears more of the stamp of the individual who brought it to pass, and, if the word "photograph" is held to be misapplied because of its literal meaning in the Greek, call the work something else, or allow a broader and more useful meaning to be attached to the word. Once let it be understood that so long as light lays the foundation, and, not only that, builds the greater part of the edifice, the resulting work of light and brush together may bear claim to be called a photograph. The man of taste knows when to stop, so as not to smother the sun's efforts under the marks of the pencil. Refinement and delicacy will demand that he shall; otherwise, he will produce nothing but "club portrait" work.

Whether photography will fully expand or not, as it is to be hoped it will, depends on the application of liberal ideas. There is nothing to fear from those who, lacking the skill to apply artistic methods to its advancement, say when they behold the outcome of those methods: "Banish this, for surely it is not photography," for the independent mind will see, if even they be right, it is nothing degrading. For verily it is art, art of an unambitious kind perhaps, through stress of circumstances, but art which will show itself unobtrusively and unmistakably in the photography of the future.

HECTOR E. MURCHISON.

PHOTOGRAPHIC MORDANTS.

[Scientific American.]

THIS process allows to fix upon tissues, by the aid of the light, mordant dyeing dyestuffs, so as to produce designs or photographs upon the tissues by simple dyeing. After carefully cleaning the material by the usual processes, it is dipped into the solution of a substance which is sensitive to the action of light and susceptible of leaving a basic metallic oxide upon the fibre such as: the alkaline chromates and bichromates, which leave a brown chromium oxide (ammoniacal sodium chromate,

ammoniacal potassium chromate, bichromate of potash, of soda and of ammonia); the highest degrees of iron salts (perchlorides, oxalates, citrates, tartrates, bioxalates, bicitrates and bitartrates of iron); the uranium salts, especially nitrate of uranium; and the salts of copper, especially perchloride. The salts of gold, silver, and platinum, although sensitive to the rays of light, are not available, because the finely divided metal which they leave upon the fibre has no affinity for dyestuffs. The material is in the dark impregnated with one of the above-named salts, or a mixture of them, is dried likewise in the dark, and then under a photographic negative for a suitable time exposed to the light, when an image is formed whose colour and intensity vary according to the nature of the salt used. The tissue is then washed, in ordinary water acidulated with hydrochloric or sulphurous acid, for the alkaline chromates and bichromates, when the brown oxide, which has little affinity to dyestuffs, is transformed into a green oxide, which is a powerful mordant; or in ordinary water for the salts of uranium, iron, copper, &c. The materials can thus be dyed at once, or may be dried and put away until wanted to be dyed, either with natural or artificial mordant dyeing dyestuffs as usual.—Mon. d. l. Teint.; Textile Colourist.

JEAN HELOUIS AND CHARLES DE SAINT-PÈRE.

THE HAND CAMERA AND HAND-CAMERA WORKERS.

[Manchester Photographic Society.]

UNDER persuasion of your Council, I have consented to read you a paper as an introduction to a discussion upon the hand camera, and in doing so I feel that, firstly, I must review somewhat the position of the camera in question. In looking over a few year-books relating to photographic matters, I find no less than 230 different hand cameras are advertised and described during the last four years, and, no doubt, this vast number is not all that have been placed upon the market, for the benefit or otherwise of photographers in general.

The rapid development of the hand camera, in all its various forms of magazine, roll-holder, and last, but not least, the dark-slide form, is, I think, one of the most astounding features of the present age. What a power it has placed in our hands! it has given the enthusiastic photographer a new interest, and invested his life with a new and inexhaustible charm; to many it is a delusion and a snare, because too much is attempted with it; but there is hope that, with study and practice, the awakening will come that makes the little camera an inseparable companion to all.

The hand camera has not always held the position it does to-day, a few years ago great was the outcry against it, most of our big guns were against them, and condemned them at every point; but there was nothing sensible in their contentions, and the hand camera has out lived it all, and to-day we find men in the front rank of artistic photography using it, and their productions hung upon the walls of the Salon and other prominent Exhibitions, which is sufficient proof that the hand camera has come to stay, and it is more popular to-day than ever—and why? Because we are able to photograph scenes, objects, and places that were hitherto not practicable with the stand camera. Take, for instance, cattle studies, marine pictures, and, more especially, the life of our great towns at home and abroad—what better mode of recording for future reference the life and character than the hand camera—our street trades, such as the organ grinder, street artist, hawker, scissor-grinder, &c., will soon be objects of the past, and pictures of them will be of as much value to the future artist and historian, as a set of pictures of old houses?

Then, again, what beautiful effects of light and shade can be got in sea and river scapes; wind-blown reeds and rippling waters, showing the true effect of wind, and the delightful clouds perfectly rendered, all these are best got with a hand camera, which is ready at the right moment.

It is true they can be obtained with the ordinary camera, but I fancy, if we trusted much to our old friend for these subjects, we should miss them more times than we succeeded; but I am getting away from what I wanted to treat more fully upon.

The hand camera to-day is in universal use, and thousands of plates are used every year, yet the bulk of the results we see does not justify this waste, as, I think, not sufficient thought and care is exercised in the use of the camera, &c.

Many of those who do not succeed are those who commence photography with a hand camera, and sad are their productions; and this also applies to many who are old and successful photographers, who use the hand camera without studying its uses and powers, and shoot off at any thing and everything, on the off chance of getting a few good ones in between by accident. It does not seem to matter what the light, or its direction, giving exposures they would never dream of giving with their stand camera, with shutter attached, and, above all, not paying sufficient attention to the proper composition of their pictures.

The man to succeed is one who has studied photography from its serious standpoint; he has been taught that a picture requires to be composed in his ordinary camera, and it is the same with the hand camera, but in a more prompt manner; he must be like a good soldier, cool and deliberate, having quickness of perception and promptitude of action. He also knows that it is useless to set his shutter too quick or too slow, and to get a negative of a certain kind he must use a stop suitable to his subject, &c., and it is useless exposing his plate unless everything is in correct order, light, lens, and plate all working in harmony. I do not mean that the light should be of the most brilliant sunshine; I have found that a soft clear light is the best, such light as we get in the country after rain being conducive to good results, as the shadows appear to be more clear and better lit.

And our ideal worker knows how to treat his plates in development to avoid such hard, harsh negatives we often see in hand-camera work. All these factors, which he has studied, help to make his work a success, and he is the man I should class as a good snap-shotter.

I do not advocate one make of camera over another, as I think most of the best makes are good, and will give good results in the right hands, for I fancy more workers blame the tools they work with than their own little selves.

In the choice of a hand camera, the use you desire to put it must be taken into careful consideration. If you require one to do all your work (which is not to be recommended, as you must suffer in some way), you must select one of a universal pattern, that can be used with different lenses, rising front, swing back, &c., and to be useful for stand or hand; so we must make up our mind to what use we intend to put our camera, and select accordingly.

In making my own choice, I choose one of the focussing magazine type as being more suitable for my purpose, which is mainly as a means of transferring to safe keeping the many varied scenes in city life, and also at a companion to my stand camera (I always take the two) when out upon a photographic hunt, as I am always coming across subjects that cannot be treated with the stand camera, and then the hand camera comes in useful. Some want a camera to fill all purposes, but I think most of us are more considerate in our demands. Keep the camera to its legitimate work—and surely that is ample—and, even if you do and are disappointed, do not blame the camera, the maker, or the plates.

I will now proceed and examine the hand camera in detail. First, as a hand camera, it should be compact and self-contained, the lens, shutter, and all internal arrangements should be easily get-at-able, it should be unobtrusive and, above all, well made and light-tight.

It should have as few projections outside as possible, as they only attract attention and make it harder for workers in general to obtain their pictures.

The lens I give preference and recommend is a rapid rectilinear; but of what focus, may be asked? This is a very wide field, many prefer what is called a fixed-focus lens, which is practically any ordinary lens so set that everything above a certain distance is in focus. Thus, a three-inch lens on a quarter-plate working at *f*-11, will give a sharp picture at all over eight feet and beyond, but a three-inch lens is of too great an angle for good work; a four-inch lens working at *f*-11 would require objects to be at fourteen feet and beyond, but even four inches are too short a focus to obtain true perspective, and fourteen feet is too near for general work, and the objects in the distance are of too small a size to be of much use.

We will now consider lenses of five to six-inch focus; these are generally considered to be about the best to use with quarter-plate. You can get pictures of a more suitable size than with those of shorter focus, and, again, the perspective is more true to nature, and therefore we get more pleasing pictures, to use one of five and half inch at fixed focus, you would require to use it about twenty-eight feet at *f*-11 to get all in focus, and to use it as a fixed focus, and this distance is a good one for general work.

I have here an old one of Wray's five-and-half-inch focus fitted with iris stops from *f*-5 to *f*-64, and these stops are very useful; this I usually use at *f*-11, which gives me good covering power and grand definition.

The new lenses of Goerz & Cooke are very fine lenses for this class of work, especially when working with a large aperture; but I fail to find any advantage over an ordinary rapid rectilinear lens in the definition, which is one of the principal factors in hand-camera work. I am looking forward to having the opportunity of testing one of the new lenses by Mr. Wray, as I am sure there is great scope in the manufacture of new lenses, and this one claims the same advantages for quarter-plate as Goerz & Cooke's, but with an additional advantage of being able to use it on any camera up to whole-plate in size.

We now come to the advantages and disadvantages of fixed-focus and focussing hand cameras.

The fixed-focus camera will best suit the lazy man, as it is always ready of focussing, and requires no judgment on this point. A camera fitted for fixed focus usually has a lens of short focus, which means exaggerated perspective. It is, however, a good camera for those with bad eyesight and those who cannot master the judging of distance, but it should be fitted with a medium-focus lens. The objects taken with most fixed-focus cameras are smaller and more of one size than those of a focussing type, as by focussing you can get pictures of a more suitable size, and vary the size of your picture, &c., according to the closeness you can get to your subject.

All our best makes of camera are made for focusing, which is, I think, a good recommendation for their use. The focussing distance between objects nine feet and 200 feet is so very small, and will cause you some surprise if you will examine a carefully marked index; this one, for a five-and-half-inch lens, is only three-eighths of an inch, this is so small that with a little practice, you will hit the correct distance every time.

You can, of course, use your focussing hand camera at a fixed focus. Perhaps the focussing arrangements of some cameras have frightened many, and mistakes are, no doubt, made, in starting with this class of camera, in judging the distance of pictures taken; but it is a difficulty which has to be faced, and you will be surprised what a little practice will do for you in this direction. A good method is to practise judging distance as you walk along the street, and lanes (without your camera), judge the distance of an object, and measure the distance with your steps, at the same time keeping your eyes upon, and storing up in your mind the distance you have measured; and this, together with the great latitude a good lens will allow, you will find fussy pictures a thing of the past.

Whatever focussing arranging is chosen, it should be easy to get at, and the scale marked in a reliable manner.

Of the finder I shall say very little. There is nothing to equal a twin-lens camera for this purpose, but they are bulky and expensive.

That the finder is a great help no one can deny, but it is as well to get into the habit of doing without one, as oftentimes, in street work, you have not time to use a finder; you come across a picturesque group of characters, and your mind at once composes it into a picture, and snap must go the shutter or it is lost.

In all cases see that your finder gives the same amount of subject as your lens, or your pictures will not be what you expect them to be.

The shutter is an important point which we must not overlook; we all know the vast variety there is on the market, but opinion upon shutters is very much alike. Most workers plump for a good blind shutter. At one time, I did not think it mattered much if the shutter worked at front or behind the lens, but, during a holiday with a friend at the seaside, we devoted an afternoon to photographing breaking waves. We both had hand cameras, my friend's was fitted with blind at back, and mine had blind at front; result, the friend's negatives did not develop up at all in some cases, and, in others, they had a strange, much under-exposed appearance, from the fact that the spray from the water had covered his lens with mist, and the result was he missed the pictures, while mine, with the blind at the front to protect the lens, developed up all that could be desired.

But, whatever form of shutter is chosen, it should work noiselessly and without vibration, and should be fitted to give various speeds. Do not work the shutter at an unnecessary speed, but work it quick enough, at the same time remember your plate will stand as much exposure as you are likely to give it with a hand camera.

In taking street scenes, landscapes, cattle pictures, &c., it is surprising how slow you can work the shutter, and still get the picture sharp, at the same time not running the risk of under-exposure.

We now arrive at the mode of carrying our plates or films. Of films I have little to say, for, until they make them as reliable as glass, I am content to carry weight; I have tried different makes every year, but they are in no way as reliable as plates. Some people say they never had a bad film, so perhaps I am too particular. All the variety of forms in storing plates is mainly of the well and automatic order, which are changed in every possible way, some good, some bad, yes, very bad.

Then there is the well-known dark slide.

Most of the well changers are liable to dust if great care in cleaning is not resorted to, and we do hear stories of automatic changers going wrong, but, as far as I have been able to trace in many of these cases, the worker himself has been to blame; in some cases they place thick plates into the sheaths, and so put them out of shape and render them useless for perfect and smooth working. I use one of these changers, and have never had a plate stick during the four years I have used it. I have found a rapid changer an advantage in many ways. First, compactness, and being self-contained; second, quickness of action, as oftentimes a picture is upon you before you are fully aware of it; and, again, you can often get two or three shots at a specially good subject.

To guard against dust, I should recommend the inside to be dusted out well each time the camera is used, and a little vaseline rubbed upon the sides, to which any dust will adhere. I find, when I neglect this, my negatives take a lot of spotting, and are sometimes ruined, especially in cloud effects.

Another point, which is often overlooked in cameras where sheaths are used, is the fogging of plates by the edges of the sheaths wearing bright; workers often wonder at markings on their plates, but I fancy they have not far to look for the cause—try and keep them blacked.

The dark slide has much to recommend it that I cannot overlook, and, for any one who uses a hand camera for all purposes, it is without a rival. You can use any make of plate at will, as the light and subject may desire; but against the advantages are to be placed many disadvantages, being more bulky and expensive, and also slower in action, you have to place the slide in, draw the shutter, &c., and perhaps, when the slide is withdrawn, after the hurry you were in to take your picture, you do not remember if it was plate No. 5 or 6 you exposed.

The camera I show here has a counting index, which is altered when the plate is changed; therefore no mistake.

Now we arrive at perhaps the most important part of my paper, the subject of plates.

The plate I prefer is the quickest I can get, that will develop clean and full of detail in the shadows, without fogging, if possible. Of course we all have our pet make of plate, and our favourite way of developing them, and my advice is, Choose a good plate, and stick to what we find best suited for our subjects.

I prefer a quick plate over a slow one, for, if the light or subject is such as do not require it, I prefer to stop down; again, you have all this reserve speed up your sleeve, as it were, for in our delightful climate we do not know how the light will be two hours together, or we may want the speed as the day wears on. Some workers prefer slow plates, but then they use them at the seaside, or in the open country, where perhaps they are all that is desired. But in street work, such as we have in Manchester, and other such subjects, they would not be of any use, and nothing short of the most rapid plate is of service.

Much has been said and written upon the speeds of plates. It is well to select a brand of plates that issue them at one consistent speed, and then you know what you are working with; but to use a brand that one day is marked H. & D. 164, and the next day the same brand H. & D. 206, is not at all conducive to good and consistent work; yet I got and used two such boxes during the past season for a series of trials.

Andrew Pringle, who is an undoubted authority upon the subject, says: "Test your plates carefully and thoroughly for yourselves; pay no attention to the marks on the makers' boxes, but test them in daylight." Again he says: "It is most important to make trials of our sensitive materials under conditions as nearly as possible similar to those of the climate where the actual work is to be performed," and, with this good advice, I will leave the subject of plates.

We have now got our camera complete and loaded, and, having made ourselves accustomed with all its workings, we will set out in our endeavour to find pictures.

How shall we hold our camera?

This is another wide field in hand-camera work, and hardly two workers hold them alike; some hold them out in front, some against their chest, while others use them at one side or the other, while one maker advises you to hold it under the chin; so what are we to do when opinions differ in this manner?

Hold it where it appears to be least seen and at the same time being easy to work. I find the plan of holding against my right side as good a plan as any I have tried, thus (shows.)

In the method of working when in the country, it does not matter much if you attract attention; but, when in the street, it is best to appear to come up to the subject naturally, as it were, and not attract attention with many movements. Use a finder if you want one, but do not forget your picture in your kindly attention to it. Hold your camera firm and steady, as I think a number of the fuzzy pictures that are got can be traced to not holding the camera steady at the moment of exposure. Hold the camera as level as possible in street work, as nothing looks so bad as drunken architecture, even if only filling the background. Of course, in landscapes and seascapes, the camera can be tilted as much as you like, without any very serious defect.

Work with a system in the changing of your plates, setting the shutters, &c., and then you will not be in a constant fluster, which always leads to mistakes, and, if you perform all the little changes by a system, you will be surprised how easy the work appears to be; for, if a worker is careless, the hand camera will show it up to his cost; and remember that an east wind means bad light, even if the day appears bright.

We will now suppose that our plates have been exposed and are ready for development, and the first thing the old tripodist, who is taking up hand-camera work, will be to find out he has to learn development over again, and I think I am correct in saying that this is the department in which many pictures are lost.

For developers I cannot claim to have anything fresh or novel, and I must confess I am greatly behind the times in this respect, for I have not tried any of the new developers. There are all kinds of reports going about of what you can do and what you can get; some would have you believe you could get a negative with a snap-shot in a coalhole if you used *their* developer; and others, that *their* developer would bring up the faded image upon a worn-out sixpence; yet, in face of all this, I am content to use that much-knocked-about friend, pyro-bromide and ammonia, all made up in 10 per cent. solution, so that I can make up any formula that I desire, either for snap-shot or ordinary work.

In developing, I go for detail first, and let density take care of itself. What I think is best to aim for is a soft, clear negative, full of detail and fine gradations. For ordinary landscape and seascape work in open country, I take for developing:—

Water	2 ounces.					
Pyro.....	3 grains	or 60 mins.	of 10 per cent.	solution.		
Bromide	1 grain	„ 10	„ 10	„	„	„
Ammonia ...	1 min.	„ 10	„ 10	„	„	„

and for street work or any quick exposure,

Water	2 ounces.					
Pyro.....	2 grains	or 40 mins.	of 10 per cent.	solution.		
Bromide	½ grain	„ 5	„ 10	„	„	„
Ammonia ...	1 min.	„ 10	„ 10	„	„	„

Flood this over the plate with an even flow, and cover over at once with a piece of board, and keep well rocked; examine in the course of abou

one minute, and, if correctly exposed and developer is right, the high lights should have commenced to show; if this is so, keep on as you are, and development will proceed; add more pyro and a little ammonia if more density is desired. If, however, after, say, two or three minutes, no signs of any image appear, add five more minims of ten per cent. solution of ammonia, and keep on adding at short intervals until development is complete, adding more pyro if wanted, keeping the plate well covered and rocked all the time. Develop until the plate is dark all over, and the image seen at the back, as I find that in all rapid plates the density is not as real as it appears to be, and much is lost in the fixing bath. I think a little fog is no drawback to a negative; many of my best negatives are fogged in the shadows, which I prefer to clear glass.

Seeing that most of our hand camera negatives are used for the production of enlargements or lantern slides, they should be kept of the soft order, as I believe this class of negative is best for those purposes, and that the optical lantern is, without a doubt, the best method of showing the picture we have obtained with the hand camera, and that lantern slides are the best means of keeping a set of pictures together, for prints have a bad habit of going astray. S. L. COULTHURST.

DOES MARRIAGE CAUSE LIKENESS?

[Troy Daily Times.]

THERE are many maxims and proverbs in vogue in the world which are really based upon nothing but the unsupported opinion of individuals. Among these is the proposition that husbands and wives who have lived long and happily together come at length to resemble each other, not only in disposition and temperament, but also in face and features. A society of Swiss scientists made a series of investigations and seemed to satisfy themselves that the proposition was true.

Geo. G. Rockwood, the photographer of New York, formerly of the Troy *Times* staff, we should consider a very excellent authority on this subject, as he has photographed more people than any other man on the globe, and has made a study of the human physiognomy and its characteristics, quite as much as the artistic portion of his profession. Having this question propounded to him, he says:—

"To the editor of the *Troy Daily Times:* In my forty years' experience under a skylight, during which time I have photographed over a quarter of a million people, this fact of the resemblance of two people who have been long associated in the marital relation having come to resemble each other has not been noted often enough to warrant the statement of its being at all universal. On the contrary, I think it is exceptional. And then, again, the resemblance is more temperamental than physical, and is more apparent to the eye than to the photographic instrument. What I mean by that is that the resemblance, when it exists, is more often in the expression than in the forms. This confirms my proposition that it is temperamental, and not physical.

"The strong resemblance, whether physical or mental, occurs only between two very passive natures, in whose make-up there is what the phrenologists term "a lack of combativeness." The love of peace, and perhaps the love for each other, prevents the exhibition of assertiveness on the part of one or of the other. This resemblance never occurs where there is a strong dominating spirit on either side.

"Of course my statements are opinions, and not *ipse dixits*. My impression is that, where one nature strongly dominates another, the weaker one grows less strong and further away from the mate, than where the natures are more equal.

"The marital relation as existing between strong characters has been one of great interest to me. I have noticed that great representative men who have delayed marriage until mature judgment could be formed, and where they have selected with what one might call wisdom, have chosen for their wives very passive, domestic natures. If it was politic, I could mention a great many illustrations that have come under my eye in my long career. Such marriages are very harmonious, peaceful, and lasting, and husband and wife grow closer together as older they become. It is, so to speak, an agreement to differ. In such cases there is no physical resemblance between parties.

"Another experience that I have had bears indirectly upon the question, and I think is of interest, and that is, that the opposite sex usually inherits the mental attributes, while the same sex will inherit the physical qualities. For instance, a daughter is likely to inherit the father's intellectual qualities, while the son will inherit the mother's mental qualities, with perhaps the physical resemblance of the father. I have noticed this criss-crossing of mental and physical attributes through three or four generations, and remarkably so in my own family.

"Returning to my first point, my observation would lead me to say that only passive temperaments, living quiet, uneventful lives, will resemble each other, both mentally and physically, to a degree. But this is so rare that it cannot be noted as a dominating quality in the human economy. This will be confirmed by people who have travelled abroad and gone among the peasantry of the old world, who will often so strongly resemble each other that a community seems to have been cast in the same mould.

"Ante-natal circumstances and influences have been the study of philosophers and scientists in all ages since the early Romans, for it is known how they sought to influence the valour and courage of coming generations by surrounding the mothers with heroic statues, pictures and works of art and everything which would develop the partriotism and valour of both mother and offspring.

"If, therefore, centuries ago it was known that surroundings affected the development of the human race, it is fair to assume that in our own day it is alike a potent factor, and, if positive surroundings will develop characteristics, an uneventful life would have a like negative result."

GEO. G. ROCKWOOD.

News and Notes.

THE PHOTOGRAPHIC CLUB.—The next weekly meeting of the Club will be held in the Club-room at Anderton's Hotel, Fleet-street, E.C., at eight o'clock on Wednesday evening, January 1, 1896. The results of the "Watkins" Developing Competition will be announced by the Judges, Messrs. F. A. Bridge and J. B. B. Wellington. Mr. Watkins himself will be present, and will probably comment on the results of the competition. Visitors are always welcomed by the members.

PROSECUTION UNDER THE PHARMACY ACT.—At Glasgow Sheriff Court last week, before Sheriff Fyfe, Thomas Bryce Buchanan Kerr, assistant to Alexander Cross & Sons, seed merchants and chemical manufacturers, 19, Hope-street, pleaded guilty of having sold a bottle of "Ballikinrain Ant Destroyer," which contained arsenic, Kerr not being a duly registered pharmaceutical chemist. Mr. T. B. Morrison, advocate, Edinburgh, who appeared for the prosecutors, the Pharmaceutical Society, said that the sale of this article might have resulted in most serious consequences. This "ant killer" was spread upon twigs, and a child might take sufficient arsenic on his finger to poison himself if he put his fingers to his lips. He asked his Lordship to impose the full penalty of 5*l*. Mr. Wm. Borland, writer, who appeared for the accused, said it was the old story of "our craft in danger." It was not that the accused had failed to observe any precaution necessary for the safety of the public. He was simply being prosecuted for infringing the monopoly of the Pharmaceutical Society. The Sheriff said that the bottle bore on it in large letters the word "Poison." On the back it bore, in conspicuous letters, the word "Poison;" and among the directions there was in italics, "It is a poisonous compound; keep it out of the reach of dogs; cork the bottle and lock it up when not in use." There could be hardly any doubt that the people who bought this commodity were well warned. So far as the failure of the accused to observe the stipulations in the Act as regarded the sale of poisons was concerned, Kerr seemed to be a victim of "the letter which killeth." He did not think that Kerr had any idea of committing an offence against the Act, and as this was a new development of the application of the Act to the sale of poisons, and as the accused was merely a servant, and the object of the prosecution would probably be served by the publicity which the case would obtain, he would dismiss him with an admonition. As it was a test case he would not allow expenses. Personally he did not sympathise with these prosecutions against *employés*.

Meetings of Societies.

MEETINGS OF SOCIETIES FOR NEXT WEEK.

(December.	Name of Society.	Subject.
30	Camera Club	
30	North Middlesex	
31	Birmingham Photo. Society	
31	Brixton and Clapham	*Experiments with Light.* J. C. Osborne.
31	Hackney	
31	Halifax Camera Club	
31	Lancaster	
31	Leith	
31	Paisley	
31	Rochester	
31	Warrington	
January.		
1	Croydon Camera Club	*How to Make Lantern Slides.* A. E. Isaac.
1	Leytonstone	
1	Photographic Club	
1	Southport	
1	Southsea	
2	Birmingham Photo. Society	
2	Camera Club	
2	Dundee and East of Scotland	
2	Glasgow Photo. Association	
2	Glossop Dale	
2	Hull	
2	Leeds Camera Club	Members' Lantern Evening and Criticism of 1895 Competition Prints
2	Leeds Photo. Society	
2	London and Provincial	
2	Oldham	
2	Putney	
2	Tunbridge Wells	
3	Birkenhead Photo. Asso.	*Dumfries.* R. J. Walker.
3	Cardiff	
3	Croydon Microscopical	
3	Holborn	
3	Leamington	
3	Maidstone	
3	North Kent	
4	Hull	

ROYAL PHOTOGRAPHIC SOCIETY.

DECEMBER 17,—Photo-mechanical Meeting,—Mr. H. Snowden Ward in the chair.

Mr. E. J. WALL read a paper entitled *Notes on Three-colour Printing*. He remarked that it had been said that the proper way to work was first to determine the spectral sensitiveness of plates by photographing the solar spectrum, and then to so adjust the light filters as to split the spectrum up into three parts. He would be the last to decry such a method if it were practical; indeed, such a study was of considerable value, and for this purpose he advised the use of a prismatic solar spectrum and glass lenses, particularly those of Zeiss, Goerz, Cooke, or the collinear lens. The idea that the use of two or three dozen screens was necessary was an absurdity, and would lead to considerable trouble. The illuminant should be sunlight, or, failing that, four electric arc lamps of about 3000 candle power each would yield satisfactory results if suitably arranged. The best lens that he had been able to find was the Zeiss triplet apochromatic, now no longer made, and next to that he thought the new Satz-anastigmat of Zeiss was the best for covering power. The focus of the lens should not be less than sixteen inches. The focus should be adjusted with the light filter and lens stop in position. If it was inconvenient to sensitise one's own plates, commercial plates would yield results quite as satisfactory. As a developer, he recommended a mixture of metol and quinol, and the best negatives were those which did not require intensification or reduction, as those operations might alter the relative values of the deposits. The inks must be absolutely pure in colour, they must be transparent, and all must have the same visual intensity. He thought collotype was not a commercial process for three-colour work if accuracy of results was to be considered; but, if expense was no object and delicacy and beauty were desired, collotype was preferable to the ordinary half-tone or process blocks. Photogravure ought to give the finest results, but the cost was against it. At the present time the process block was the cheapest for commercial work, but the network deadened the value of the colours. Better results would probably be obtained by using irregular-grained screens for two, if not all three of the plates. It appeared that Dr. Albert, of Munich, had taken out a patent for the use of lines crossing at an angle of about 30° and about 60°; but Mr. Wall said Mr. F. E. Ives showed, at the Society of Arts, in 1892 or 1893, a print produced by him in 1881, with single lines crossed (he believed) at that angle. Mr. Wall had found, too, that 30° was not the best angle.

Mr. WALL then read a paper by Mr. C. G. Zander on *Printing Inks for Three-colour Work*, in which he insisted that the essential qualities of photochromic inks were permanency, transparency, and purity of colour, and that it was necessary in printing to use good, hard, well-sized and glazed paper, and eight or ten sheets of cream-wove paper as packing. If these requirements were fulfilled, it would not be difficult to print from blocks of very fine grain.

Mr. MARTIN CÖHN expressed his surprise that the three-colour process had not made more headway in England—the English printer was too conservative to go out of the beaten track.

Mr. LEON WARNERKE called attention to the confusion caused by the use of the term "screen" to describe both a line screen and a colour filter.

Mr. W. GAMBLE thought theory had done its utmost for the process, and that more practice was now required—more competition was necessary. In America it was recognised that the final result depended on the etcher rather than on the negative-maker. Practical workers were afraid to take up the work because so many contradictory statements were made about it, and so much experimenting was going on. Lithographers, for instance, would not believe that perfect colour rendering was to be obtained by the use of three inks, and he asked Mr. Wall whether he believed that perfection was to be attained by means of three colour filters, three sensitised plates, and three inks. The work of Messrs. Fleming in standardising the inks was the greatest assistance which had been rendered to the process.

Mr. CHAPMAN JONES did not see the necessity for restricting the use of the term "screen," as suggested by Mr. Warnerke. He had always found that the use of a colour screen destroyed definition with any lens, even if the focus was not changed.

Mr. GRAY asked what means Mr. Wall adopted to obtain images of the same size when using different colour screens.

The CHAIRMAN, referring to the question of Dr. Albert's patent, said that, even if such patent were valid, there was no difficulty in the way of three-colour work, for there were six different methods of arranging screens, none of which would infringe the patent.

Mr. WALL agreed with Mr. Warnerke as to the use of the terms "colour filter" and "screen," but usage rendered a change difficult. After trying liquid colour screens and coloured glasses, he had decided to use screens of collodion, saturated with aniline dyes. The negative played quite as important a part in the production of a perfect result as did the etcher, and if the latter did most of the work, he simply did the work which should have been done by the man who made the negatives. Three inks were sufficient for any colour, including black, which was evident from specimens which were exhibited. Mr. Agar Baugh had informed him that the Zeiss apochromats were not now made, and that the patent had lapsed, and anybody might make them, but the Satz-anastigmat was equally apochromatic. When using screens of optically worked patent plate glass, coated with a structureless collodion, there was no loss of definition, even in very fine line work. When using the newer lenses and collodion screens, he found no difficulty in obtaining images of the same size, but when using the ordinary rapid rectilinear lenses there was a decided difference, and it was then necessary to focus on a foot rule at the same time as on the object.

The meeting closed with a cordial vote of thanks to Mr. Wall and Mr. Zander for their papers.

DECEMBER 19,—Special General Meeting,—Sir Henry Trueman Wood, M.A. (President), in the chair.

The meeting had been convened pursuant to a requisition, signed by eleven members of the Society, to consider the question of altering the Articles of Association for the purpose of providing for the addition annually of a certain number of new men on the governing body, as suggested by the President in his annual address.

The PRESIDENT called attention to the clauses in the Articles of Association which regulated the calling of special meetings, and ruled that the present meeting was not competent to take any definite action, as the requisition did not specify the intention to bring forward any particular resolution. He thought, however, that the subject indicated might be discussed, and that, if the opinion of the members present appeared to be in favour of an alteration of the rules, the Council might take upon itself the responsibility of calling another meeting in legal form, when a vote could be taken and the question definitely dealt with.

Mr. E. J. WALL, the first of the signatories to the requisition, stated that it had been his intention to move a resolution providing that a sufficient number of the senior members of the Council should retire and be ineligible for re-election, to make with deaths and resignations five vacancies on the Council at each annual election, in order to admit of the introduction of new blood on the governing body. He disclaimed personal feeling in the matter, but was of opinion that, when the Council remained practically the same year after year, there was a danger of their getting into a stereotyped way of working, and that thus the Society would stand still instead of advancing with the advance of photography, and would be led by other organizations instead of retaining, as it should, the leading position in the photographic world.

A long discussion followed, in which Messrs. Debenham, Snowden Ward, Bolas, Sebastian Davis, Mackie, Chapman Jones, Cadett, Marchant, Sinclair, Newman, Gotz, Pringle, Dallmeyer, and others took part, and ultimately a resolution in favour of the proposed alteration was passed, with only two dissentients.

The PRESIDENT said that, in view of such a clear expression of opinion, he would suggest to the Council that steps should be taken to arrange the necessary formalities for the amendment of the Articles of Association in accordance therewith.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

DECEMBER 19,—Mr. T. E. Freshwater in the chair.

The HON. SECRETARY announced that the next meeting would be held on January 2 in the new year at the new premises at the White Swan, Tudor-street, E.C., when Mr. T. E. Freshwater would show his method of throwing stereoscopic pictures on the screen.

Mr. W. D. Welford passed round an enlargement from a snap-shot of Mr. Traill Taylor taken at the Convention.

The HON. SECRETARY read the following account of some experiments he had made with the Cooke lens, as suggested by the makers in a letter read at the last meeting:—The two lenses I have compared are a Cooke, of 5 inches focus, No. 92, and a Goerz, by Ross & Co., of 4¾ inches focus, No. 2268. It will be remembered that at our last meeting I read a letter from Messrs. Taylor, Taylor, & Hobson, pointing out that in comparing the Cooke lens with another of different type, in examining the oblique images for astigmatism, the conditions should be made uniform by reducing the diameter of the larger lens to that of the smaller by covering the surplus margin of the front glass with a black ring or mask. To equalise the conditions, I measured the effective aperture of the Cooke lens at *f*-8 on the front glass, and covered the margin with a ring of black paper. To test the two lenses for fine definition over a flat field and for astigmatism, I pinned four sheets of print and three of Messrs. Taylor, Taylor, & Hobson's tests of concentric circles on the edge of a door, and set up the camera, a 7½ × 5 inches, at about 5 feet distance. Both lenses fit the same flange, and it was only necessary to change them without otherwise disturbing the camera. The images were carefully focussed at the centre of the field with aid of a strong magnifier. The aperture in both cases was *f*-8, and the negatives show that the area of fine definition over a flat field is much larger with the Goerz than with the Cooke lens. Under such conditions, I estimate the Goerz covers sharply a circle of 1½ to 1¾ inches greater diameter than the Cooke. By fine definition I mean the legible rendering of the print, which is minion size. Both lenses appear free from astigmatism, but the Goerz has a flatter field. At the narrow end of the 7½ × 5 negative the concentric circles are woolly and the letters T T and H obliterated in the Cooke negative, but in the Goerz negative the same concentric circles and the letters are well defined, and the smaller print of the word "copyright" is not far off legibility. At the margin of the Goerz negative the test circles are far better defined than another set an inch nearer the centre on the Cooke negative. The next two negatives are of the back wall of a house. They again demonstrate the superiority of the Goerz lens for flatness of field, and you will also notice that the lines of the windows near the margin of the Cooke negative show a want of rectilinearity. The Goerz negative, on the other hand, is free from this defect. I also used both lenses for exposures on the interior of a greenhouse; the Cooke at *f*-45, and the Goerz at *f*-32. The reduction of aperture in the Cooke lens cut down the field to a disk of about 6 inches diameter, with good definition throughout. The Goerz lens, on the other hand, covers the entire 7½ × 5 plate, and the illumination is very even to the margins. This represents a circle of 9 inches diameter, and an angle of about 85°. Comparing the two lenses as photographic instruments, the Cooke has the advantage of an aperture of *f*-6·5, but at *f*-7·7 the Goerz is superior in flatness of field and covering power. The Goerz, being of the symmetrical or rectilinear type, has also the advantage that either component may be used as a single lens of about double the focus of the combination. It may also be used as a wide-angle lens on a large plate. In point of expense and compactness these are valuable qualities to the photographer. I feel it but right to add that this Goerz lens, made by Ross & Co., is one of the finest photographic lenses that has ever passed through my hands.

Mr. COLE raised the question of the difference in length of tube existing between the two lenses, asking whether the additional mask would not render the circle of illumination smaller than otherwise.

The HON. SECRETARY replied that it was the suggestion of the makers that a mask should be used.

Mr. REG. B. LODGE, of Enfield, proceeded to give his experiences in photo-

graphing wild birds and their nests, &c., and showed a large number of photographs in platinum and lantern slides. He said they were taken partly with the tele-photographic lens and partly with an ordinary rectilinear lens, giving an opportunity of comparing the results of the two lenses side by side. The prints were enlargements of varying sizes up to 12×10. He had found the tele-photographic lens a very difficult one to work, requiring a good deal of practice, and it was not by any means rapid. One of the chief difficulties in this special branch of work was that of getting a fully exposed plate, and often, notwithstanding the exceptionally good light to be found in the Farne Islands, where he obtained his sea birds, his development had to be forced to its utmost to get a passable result, though using the fastest plates made. The colours of the birds and their surroundings, too, were bad and very much against the attainment of good pictures. The tele-photographic lens he had in use was the first form introduced by Messrs. Dallmeyer, which has now been discarded. He preferred it to the portrait form, which was not rapid enough and did not magnify sufficiently. It worked at equivalent to *f*-16 or *f* 22 with an ordinary lens. The work necessitated a lot of patience on the photographer's part; he had had to lie in the bottom of a ditch for seven hours once, waiting for a favourable opportunity. A disguise was also necessary, and he had used a bag made of green stuff, which covered up the camera and himself. In the case of nests with eggs or young birds, he used an ordinary rectilinear lens, but the birds themselves were mostly taken with the tele-photo lens. Asked as to how one could get the interior of a nest in a hedge, he said in many cases it was impossible, but sometimes it could be tilted. The photographs were much admired by the members, one taken with a ten-inch lens at a distance of only three feet from a wild bird being particularly good.

Mr. Medland supplemented Mr. Lodge's slides by a few of flying pigeons and horses in motion.

PHOTOGRAPHIC CLUB.

DECEMBER 18,—Mr. E. Crofton in the chair.

A letter was read from Mr. Coles, of Barnet, relating to the discussion which his camera gave rise to on the previous week.

Mr. PARFITT said that he then stated that an illustration of a camera with a rising and falling front, with a roller blind exactly the same as the one Mr. Coles exhibited, but without the rack and pinion, was to be found in a book published some years ago. He had since referred to the matter, and found that it was described in *Die Photographie farbiger Gegenstände*, by Vogel, published in 1885.

The subject for the evening was *Rambles in Epping Forest*, by Mr. H. T. Malby. Mr. Malby was unfortunately prevented from being present, but forwarded 100 of his slides and notes on the subject to the Hon. Secretary.

The slides formed a most excellent series, and gave much pleasure by their graphic delineation of London's great playground in summer and winter. The studies of wild flowers and foliage gained especial approbation, and a unanimous vote of thanks was passed to Mr. Malby for his slides.

Mr. FOXLEE and Mr. BRIDGE expressed their pleasure at seeing Mr. Sebastian Davis at the meeting. Mr. Davis was one of the members of the old South London Society, and it was out of this Society that the Photographic Club sprang.

Mr. SEBASTIAN DAVIS thanked the members for the kind way in which his name had been received. He briefly gave a sketch of the work accomplished by the members of the old South London Society, and reminded the members that the use of the acetate of soda bath for toning prints originated from that Society. He had much pleasure at being at a meeting of the Photographic Club.

Gospel Oak Photographic Society.—December 17.—Mr. W. BEYER gave a paper on *The History and Properties of Photographic Lenses.* Several different type lenses were handed round for inspection, and, at the close of the paper, Mr. Beyer replied to several questions that were raised. Two new members were elected at this meeting, and the attendance was very good. The next meeting will be held on January 7.

Hackney Photographic Society.—On the 17th inst., Mr. J. D. Grant in the chair, the Hon. Secretary showed some lantern slides toned with Iles's "Glaucolone," a solution for producing blue-green and other tones on transparencies, &c., for various effects. The "Portable Automatic Oxygen Producer" was also shown, and its powers demonstrated. It is an exceedingly compact apparatus, and the light produced at the meeting by means of the apparatus and a saturator was a very good one. The rest of the evening was devoted to a lantern lecture, by Mr. G. J. AVENT, on *Dartmoor and the Rivers of South Devon.* Mr. Avent was master of his subject, and kept his audience interested to a late hour.

North Middlesex Photographic Society.— December 16.—The Vice-President (Mr. Beadle) gave a synopsis of the instruction evenings of the past year. He reviewed in succession the various subjects treated at these meetings—Development, Intensification and Reduction of Negatives, the Camera in the Field, Aids to Improved Printing, Clouds in Negatives and Cloud-combination Printing, and the Carbon Process being among the various subjects dealt with. The lecture brought on an interesting discussion and many suggestions for future meetings, the general opinion being that the same subjects should be again treated in the near future. One Monday evening in each month is set apart for beginners, and direct instruction given by the more experienced members by demonstrations, &c. The scheme has proved highly successful, as is certified by the large attendances, the more elementary nature of the subjects treated giving beginners and others greater freedom in putting simple questions than is possible at the more formal ordinary meetings, and somewhat freeing these meetings for the purposes of more advanced work.

Putney Photographic Society.—Wednesday, December 11, Lantern Evening, Dr. Cuthbert Wyman in the chair.—Mr. J. D. Gibson gave an excellent display of lantern slides from photographs taken by himself in India, Ceylon and elsewhere, which were much admired, those of some snakes being especially interesting.

Richmond Camera Club.—December 16, Mr. Gibson in the chair.—Mr LIONEL TAYLOR gave a practical demonstration. The subject was *Frame-making and Photographic Carpentry*, but time only admitted of the first part, viz., "Frame-making," being dealt with, and the demonstration is to be "continued in our next." Every detail of the process of making a frame and fitting the picture therein was not only lucidly explained, but demonstrated by Mr. Taylor, who had brought the necessary tools and appliances for the purpose, and a number of practical hints and cautions were thrown out. A tangible souvenir of the evening's instruction, in the shape of a charming photograph, taken, mounted, and framed by Mr. Taylor, was presented by him to the Secretary to be hung in the Club-room. We now await the Club-room in which to hang it.

Barnsley and District Photographic Society.—The Second Annual Meeting of this Society was held in the Arcade Board Schools, Barnsley, on Tuesday evening, December 10, the President (Mr. O. de Mirimonde) presiding.—Prior to the election of officers, &c., Mr. T. PARKES, M.A., one of the Vice-Presidents, gave a lecture on *Chemical Changes brought about by the Action of Light.* He called attention to his last lecture, in which he showed the connexion between light and electricity, and that light consists of electro-magnetic waves of about a ten-millionth of an inch in length. He now showed the close connexion between light and heat, comparing the former with the treble of a piano, and the latter with the bass. He then went on to show numerous experiments, in which a chemical change was effected by means of heat. For example, oxygen and hydrogen were exploded, phosphorus and magnesium burnt brilliantly, mercuric oxide split up into mercury and oxygen, while, when potassium chlorate was heated, the change was shown by using silver nitrate as a sort of developer. The action of light was then shown on silver chloride, cuprous chloride, potassium bichromate on paper, ferric chloride on paper, &c., and the changes produced compared with the previous ones. After describing the action of water as a sensitiser in changes brought about by heat, he compared with it the action of gelatine in acting as a sensitiser for silver bromide, and concluded by demonstrating, shortly, the manufacture of gelatino-bromide emulsion. Thanks having been accorded to Mr. Parkes for his able and instructive paper, the Secretary presented his second annual report, showing very satisfactory progress. Starting the year with a balance of 3*s.* 6*d.*, it ended with a balance in hand of 35*s.* There was also an increase of membership. The officers for 1896 were elected as follows:—*President:* Mr. O. de Mirimonde.—*Vice-Presidents:* Messrs. A. R. Tomlin and T. Parkes, M.A.—*Committee:* Messrs. Coles, Guest, J. G. Taylor, W. Taylor, Haigh, and Ogden.—Mr. C. R. Barham, *Secretary and Treasurer*, was again unanimously elected. Votes of thanks were heartily accorded to the School Board and Mr. Tomlin for free use of rooms. The Secretary announced that, at the Society's Exhibition, to be held in January next, the Right Hon. Earl Compton M.P., would exhibit a considerable number of photographs from his own negatives, principally views in Egypt.

Dewsbury Photographic Society.—At a meeting held on Thursday, December 12, it was decided to form a Photographic Society in the district of Dewsbury. The following Committee were appointed, viz., Messrs. Thompson; G. N. Gutteridge, sen.; Stansfield; Thornes; Blakeley; along with F. W. Guttridge (Hon. Treasurer), and E. Human (Hon. Secretary). It was also decided that the subscription be 5*s.* per year; that there be no entrance fee for members joining previous to January 14, 1896, after that date an entrance fee of 2*s.* 6*d.* It is hoped that a goodly number of amateurs will give in their names to the Secretary at once, but either ladies, gentlemen, or professionals, will be eligible for membership.

Halifax Camera Club.—A large number of members congregated in the studio on Wednesday evening, December 17, to witness Mr. P. R. SALMON'S *Carbon* demonstration. During the past season the popularity of Mr. Salmon and his lecture has been one of the leading features of photographic life in the West Riding, and it was therefore no wonder that there was so large a turn up of members. The lecturer first of all gave a very brief sketch of the growth of the process, afterwards going deeply into the theoretical portion in a lucid and simple manner. Finally, he successfully developed specimens upon different kinds of paper, opal, and glass. A large number of questions were put at the termination of the demonstration, and, as the carbon process was seemingly new to Halifax, Mr. Salmon's lecture appeared to be regarded as a boon and blessing by those who wished to manufacture artistically pleasing prints. There can be no doubt that carbon takes the first rank as a beautiful and easy-printing process, and Mr. Salmon's demonstrations are doing much to popularise it in the north. Elliot's tissue was used, and the firm also kindly lent some excellent finished specimens. The chair was occupied by Mr. J. Ingham Learoyd.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—December 10, Mr. W. Graham in the chair.—Mr. J. S. B. BELL, Vice-President, gave a highly interesting lecture on *Light in Relation to Photography*, illustrated by numerous optical experiments in the lantern.

Oxford Camera Club.—December 9.—Mr. J. B. WILSON described his late tour along the Moselle, illustrating his subjects with slides from negatives taken on the trip. Entering the district at Luxembourg, he passed quickly to Trvèes, stopping at Igel on the way for a very fine old Roman monument, dating from the third century. Trèves itself contained many interesting points, especially in its Roman remains, such as the amphitheatre, basilica, and old gates. The porch of the Lieberfrauenkirche was especially beautiful, the slide well showing the tint of the stone. An amusing account was given of a first experience of fireflies, and a curious ferry system of the district described. Special attention was called to the fine castles of Eltz and Ehrenberg, both being well worth study. Other places visited were Berncastle Briedal, Zell, Ediger, and Brodenbach, the two last being specially attractive.

Mr. Wilson gave many useful hints for future visitors, and a hearty vote of thanks to him was passed, with an expression of approval of his photographic achievements.

Plymouth Photographic Society.—On December 13 this young Society, which only made its bow in the early part of the present year, held its first Exhibition. Being the first, it was confined to the work of members only, but this has developed such capacity, where it was often not suspected, that another season it is probable the Exhibition will be thrown open. There were no pots or medals to compete for, but it speaks well for the industry of the members in that some 360 prints and 100 lantern slides were sent in. The prints varied from Frena pictures to enlargements of 20×16. All sorts and conditions of papers were used. Mr. Dunstan showed three frames of 5×4 of different tones, one of matt P.O.P. was toned with washing soda and gold, instead of the ordinary sulphocyanide bath, and the result was a charming sepia tone. Where there was so much that was really excellent, it is invidious, without a properly detailed report, to particularise any exhibitor's work; but the Plymouth Society is to be congratulated on its first Exhibition.

Stafford Y.M.C.A. Photographic Society.—December 9.—Mr. LUBOSHEZ, of the Eastman Company, gave a lecture entited *A Talk about Successful Portraiture and Platino-bromide Papers.* A large number of members and friends were present, and listened with much attention to the lecture. After a few introductory remarks Mr. Luboshez plunged into the second half of his subject, and dealt very completely with the subject of platino-bromide paper. He described in great detail the differences between the old form of bromide paper and platino-bromide, pointing out the special advantages which the new paper possesses over the old. Almost any negative in capable hands, said the lecturer, would give a passable print on platino-bromide, the blocking of detail in the shadows, so conspicuous in ordinary bromide, being entirely absent. The lecturer showed a contact print and an enlargement from the same negative made on the same piece of paper, which fully bore out his claims on behalf of the paper. Mr. Luboshez then proceeded to develop a print, using the ferrous-oxalate developer. He recommended the use of no bromide, but that the developer should be restrained by dilution with old developer. This part of the lecture was concluded by the demonstrator boiling the print in a mixture of alum and hypo, by which he produced the much-desired sepia tone. Mr. Luboshez then gave some very useful hints on portraiture, stating his views on the subject of lighting, and pointing out the usual defects in portraiture as conducted in the studio. He then suggested a method by which these defects might be removed, and recommended that the high light should be toned down to equalise the lighting rather than excessive use of reflectors on the shadow side. The lecturer pointed out that the use of a reflector on the shadow side produces totally different lighting on the two sides of the face, and must, in consequence, produce a perfectly different appearance of one side to that of the other.

Sunderland Photographic Association.—December 12. A short business meeting for the election of new members was held at 7 o'clock, and at 7.30 a fine exhibition of lantern slides by a former prominent member of the Society occupied the attention of the company for some time. This was followed by songs contributed by Messrs. Turner, W. J. Pearson, E. R. Kirkley, and W. Whinham, after which the members were entertained with refreshments supplied by the members of the Council. A large number of fine slides by Mr. W. D. Pratt, illustrating travels in Norway from negatives of his own, and Mr. Lynn, were then thrown upon the screen, and a most enjoyable evening was brought to a close by a vote of thanks to those gentlemen who had so kindly contributed the songs and slides. Mr. W. Milburn occupied the chair, and stereoscopic slides and other work of several members of the Council were on view.

Glasgow and West of Scotland Amateur Photographic Association.—December 16, Mr. A. Lindsay Miller (President) in the chair.—Six new members were elected, and members of Council for ensuing year were nominated. Messrs. JAMES S. GARDNER and VICTOR L. ALEXANDER gave a demonstration of photo-mechanical printing processes, including photogravure and collotype printing, showing plates in various stages of the process. Prints were then handed round, which were greatly admired. The meeting closed with the usual show of lantern slides by members.

FORTHCOMING EXHIBITIONS.

1896.	
February 27-29	Woolwich Photographic Society.
March 2-6	*South London Photographic Society. Hon. Secretary, Charles H. Oakden, 30, Henslowe-road, East Dulwich, S.E.
„ 3-6	*Cheltenham Amateur Photographic Society. Philip Thomas, College Pharmacy, Cheltenham.

* Signifies that there are Open Classes.

Correspondence.

Correspondents should never write on both sides of the paper. No notice is taken of communications unless the names and addresses of the writers are given.

ORTHOCHROMATIC PHOTOGRAPHY WITH ORDINARY PLATES.

To the EDITORS.

GENTLEMEN,—Dr. Eder, in his remarks on *Orthochromatic Photography and Spectrographic Tests* (p. 791), gives considerable detailed information which did not appear in my article to which he refers (p. 517), but, unfortunately, seems to assume that such omissions were due to ignorance on my part, whereas the true reason is that I did not care to cumber the article with unnecessary detail, and thereby make it tedious and confusing to the unscientific reader. Several facts of minor importance to which he refers as if I had not taken them into account, I had actually recognised and stated years before, but do not consider to be of sufficient importance, in this connexion to materially affect my conclusions.

Dr. Eder and myself are in substantial agreement as to the relative action of the dark violet and ultra-violet rays in ordinary photography, and as to the necessity for employing quartz prisms, or gratings, in order to avoid the necessity for making allowances for the absorption of the prisms; but we are not agreed as to the question whether these facts and their bearing upon the selection of colour screens have been generally recognised.

I confess that I did not know of Dr. Eder's writings upon this subject, which, so far as I know, have not been republished in any British or American photographic journals. The reading of those periodicals is calculated to produce an impression quite contrary to that which Dr. Eder assumes to be the prevailing one except in America. I am aware that Victor Schumann long ago called attention to the fact that the results obtained with direct-vision photo-spectrographs are misleading, and he also observed that Dr. H. W. Vogel had been betrayed into certain false conclusions by the use of such a photo-spectrograph; but, on the other hand, Dr. Vogel denied that such was the case, and has repeatedly and most positively discredited the very fact which, Dr. Eder says, "is at least generally known in German literature." Two quotations from Dr. Vogel will be sufficient to sustain my point: In *Anthony's Photographic Bulletin*, 1889, p. 533, he says, "The ordinary plates are actually sensitive for one colour only—for blue. . . . . The non-luminous bodies reflect very little violet and ultra-violet light, its action showing itself first during exposures which require a much longer time than the ordinary photographic exposure." In the *Photographic News*, 1890, p. 239, he says, "Violet and ultra-violet light, which would also come into the reckoning, are, in fact, so little reflected from solid bodies, that the said rays need not, for ordinary subjects, be taken into account."

Dr. Eder has, of course, recognised the fact that the dense flint, and even crown glass, prisms absorb much of the ultra-violet rays, and knows that a train of large prisms, even of crown glass, absorb much more of these rays than most photographic lenses, in which the ray travels through a much smaller mass of glass; but has he ever pointed out that a direct-vision photo-spectrograph might give such utterly false and misleading indications as were shown by my experiment with a chrysoidine screen, which, although it allowed seven-eighths of the work to be done by invisible ultra-violet rays in the camera (on a row of brick buildings illuminated by direct summer sunlight), yet showed no action whatever by such rays in the direct-vision photo-spectrograph, even when the exposure was so prolonged as to produce strong halation at the red end, and general fog by scattered light? Not only was the necessity for more careful tests of colour screens not generally recognised, but the recommendations of some of the best-known authorities prove that such tests were not made. For instance, Dr. Vogel not only recommended the use of coloured glasses, which my photo-spectrographic test proved to be practically worthless for use with ordinary plates, but also a screen of collodion dyed with aurine, which is even more defective in its absorption of the ultra-violet than chrysoidine. So much for general knowledge of this subject in Germany, as indicated by the "authority" oftenest quoted in English print. In England, a well-known titled writer and lecturer upon this and kindred subjects undertook to prove by visual spectroscopic test alone that chrysoidine is effective in cutting out all of the violet end of the spectrum when used as a colour screen in photographic operations; and a well-known English plate-maker says, positively, that the only effect of using colour screens with ordinary plates is to prolong the exposures without altering the character of the negative; add to this the fact, that not one of these quotations which I gave as a reason for repeating my demonstration of 1886 was taken from an American publication, and the unfairness of Dr. Eder's reference to the American publication will, I think, be sufficiently apparent.

If I understand Dr. Eder, there is one other and more important difference of opinion between us. He appears to say that, because the colour-sensitiveness of ordinary plates is comparatively feeble, therefore the negatives made on such plates by the red, orange, yellow, and green rays must be weak and wanting in contrast and brilliancy; in other words, that such negatives must be inferior in quality, in most cases, to those made on specially sensitised plates. Perhaps Dr. Eder does not mean exactly this; but, if he does, he is mistaken. Already, in 1886, I had made with an ordinary plate and my special colour screens, a photograph of a Prang chromo entitled *The Midnight Sun at the North Cape*, which was more accurately orthochromatic, and, in other respects, more satisfactory than a photograph of the same subject that had been made by Dr. Vogel on an "azaline" plate, and exhibited by him to prove the capabilities of that plate. Both photographs were shown at the Franklin Institute when I read my paper describing the method of production. Since then I have made a great many orthochromatic photographs on ordinary plates, which were equal in every respect to anything that can be produced on orthochromatic plates. Nobody could possibly tell by the results which kind of plates had been used.

Dr. Eder ought not to think that I have tried to discredit the utility of orthochromatic plates. I was certainly the first person in the world to make successful use of them in commercial photography, and have always advocated their use. I am now trying to show the importance of the colour-screen element in orthochromatic photography, and I do not know how I could have emphasised this more than by proving, as I have done, that it is the difference between screens recommended by some of the highest authorities and screens produced by myself that makes the difference between failure and success with materials condemned as worthless for the purpose by those authorities. A method of screen-testing which points the way to accomplishing so much with such apparently unpromising material, ought to have considerable value, even in the production of colour screens for use with orthochromatic plates.

I hold that one never gets the full benefit of the colour-sensitiveness of even an orthochromatic plate with screens that transmit dark-violet and ultra-violet rays; yet such screens have been recommended by well-known authorities, who make frequent use of the spectroscope and photo-spectrograph, but have not conducted their experiments with sufficient care to discover this defect. Has *anybody* but myself ever made tests which have shown why it is that yellow glasses and such dyes as aurine, chrysoidine, and aniline orange are not effective with ordinary plates, while the bichromate cell, the deep naphthol yellow in gelatine, and the brilliant yellow in collodion (first recommended by me) are always effective?

To show that we are not absolutely dependent upon orthochromatic plates for the production of truly orthochromatic photographs is not to recommend the abandonment of orthochromatic plates. The facts are of considerable scientific interest, at any rate, and circumstances are likely to arise which may lend considerable importance to a full knowledge of the capabilities at command. With colour-sensitised plates and yellow glasses orthochromatic photographs can be made with moderate exposures; better results could often be obtained with the same plates by employing more suitable colour screens; but, with ordinary extremely rapid plates and quite different screens, the same results are obtainable with very much longer exposures.—I am, yours, &c., F. E. Ives.

London, December 14, 1895.

PAPER NEGATIVES.

To the Editors.

Gentlemen,—I can heartily back up the appeal made by Mr. M. V. Portman in your issue of December 13, and more than once made by yourself during the last few months, to our bromide-emulsion paper-makers, for a good emulsion-coated paper for negative purposes. I used large quantities of Eastman's negative paper, both in rolls and sheets, a few years ago, and, I am bound to say, I got far more satisfactory results upon it than I can get, as a rule, on the celluloid rolls now in use. The permanent transparency of the latter material does not by any means compensate for its many other inherent vices and inconveniences. Notwithstanding glycerine soaking and the several other manipulations celluloid films have to undergo in order to make them flat enough to print from, if laid by for a time, they become most refractory, and develop a vicious determination to coil up like steel springs, and boldly defy all the efforts and ingenuity of any one man, with only *one* pair of hands, to uncurl and print satisfactorily from. And, as for making lantern slides from them, this is almost impossible with many of them without, at least, three hands; two to hold the film uncurled and flat, while the third arranges the plate upon it. The natural sweetness of my temper has been more disturbed since I have had to deal with these obstinate negative "coils" than by anything else I can remember.

Do, Mr. Editor, use all your powerful influence to induce some enterprising emulsion-paper-making firm to give us back that long-lost blessing, viz., a good paper roll coated with that excellent rapid emulsion which is a distinguishing feature of the celluloid films now on the market.

For interiors, &c., without a suspicion of halation, nothing even approaches paper.—I am, yours, &c., A. M. Macdona.

REPORTING AT PHOTOGRAPHIC SOCIETIES.

To the Editors.

Gentlemen,—We are pleased to reply to any writer who, like Mr. Blakeley, honourably gives his name. As to the anonymous ones, the only thing to do is to allow them to drop into their natural oblivion.

Just one or two words in answer to Mr. Blakeley. He is right as to the existence of societies being for the benefit of the members; but surely he will admit that all information on photographic progress, whether chemical, optical, or mechanical, tends to the benefit of photographic students, and, if that information is imperfect or misleading, then it is a logical sequence that the correction of such a report as was given of the "Infallible" was a legitimate act. Had the report of the meeting under discussion altogether omitted mention of the "Infallible," we would not have complained; but, when a misleading report was given, we thought that, in the interests both of the "Infallible" and the readers of your paper, it was necessary to protest.

So far as we are aware, Mr. Heywood does not even know that such a discussion as this is in progress. He, personally, has nothing to do with the matter; and why Mr. Blakeley has gone out of his way to bring in the name of that gentleman we know not.

Neither Mr. Brothers nor ourselves had the smallest idea that such an acrimonious correspondence would ensue on his exhibition of the camera, and we certainly have had no thought of anything but to vindicate our instrument from the implied aspersion cast upon it by the report.

Mr. Blakeley also goes out of his way to bring the name of the Secretary into this controversy. We have not attacked Mr. Casson, we have always been under the impression that the Secretary does not now report the proceedings, and our complaint has not been against the secretary, but against the report, for which purpose we have carefully avoided using the word Secretary in our letters. Has Mr. Blakeley used the Secretary's name and eulogised his efficiency to give a back-handed blow to a former Secretary of the Manchester Photographic Society?

Some of us remember the old times, in the days, when Dale, Atherton, Pollitt, now, alas! gone, were active supporters of the Manchester Society. At that time the Society was considered as in a fair way on towards financial trouble, and some of us cannot forget that Mr. Chadwick, the then Secretary, rescued it from its perilous position, and by clever financial management placed it in a position to realise a comfortable yearly balance.

We are glad to hear from Mr. Blakeley that the present Secretary is more efficient than the one who has such a record, and the hearty desire of all must be that he may be long spared to give his valuable services to the Society, which, as it is nearly the oldest, ought to be surely the most fair-dealing society in the country. We invite Mr. Blakeley or any other disinterested party to call at Bull's Head-yard, and we promise that our Manager, Mr. McKellen, will have much pleasure in giving him the fullest opportunity of forming an opinion as to our claims in respect to the Infallible.—We are, yours, &c., Thompson & Co.

[This correspondence here terminates.—Eds.]

ARTIGUE PAPER.

To the Editors.

Gentlemen,—In reply to your correspondent "Lux," the Artigue paper can be procured from Monsieur Joux, 48, Rue de la Victoire, Paris. I believe there are other agents abroad, but none in England. It is at present made only in black, but I understand that other colours may shortly be expected. The keeping qualities after sensitising would be, I should think, about the same as the ordinary carbon tissues. It is very easy to sensitise, and it is best to use it within two or three days afterwards. The rapidity appears to me to be about the same as platinotype paper, and this is, roughly, much the same as that of carbon tissue; but, of any strict scientific tests, I know nothing. The maker's formula for sensitising is a two per cent. solution of bichromate of potash, but workers will do well to try a five per cent. solution also. I take the opportunity of saying also that, instead of keeping the temperature of the water—in which the print is put on coming from the printing frame—as low as 70° (as stated in my paper), it may be as high as 84°, but should not exceed this. But these are details which every one will easily find out for himself.

It is advisable to obtain with the paper the specially prepared sawdust, which is very finely powdered and cannot be got in this country. It can, of course, be used over and over again, and need not be dried after using, but kept always ready in the earthenware pan.

It must be said that I have heard several complaints that the paper is not always of uniform quality. I myself have been very fortunate, but I should be glad to hear of any experiences in this respect which your correspondents may have. Mr. J. A. Sinclair, of Messrs. Adams & Co., has used this paper very successfully, and I feel sure he would be pleased to show specimens to any inquirers, and if I can be of use to others who may be interested, I shall be happy to give them what information I can.—I am, yours, &c., Alfred Maskell.

London, December 22, 1895.

Exchange Column.

*** *No charge is made for inserting Exchanges or Apparatus in this column; but none will be inserted unless the article wanted is definitely stated. Those who specify their requirements as "anything useful" will therefore understand the reason of their non-appearance. The full name of the advertiser must in all cases be given for publication, otherwise the Exchanges will not be inserted.*

Will exchange cabinet burnisher, nickel roller, for quarter-plate camera and lens.—Address, James Hill, Wallace-road, Cramford-road, Ipswich.

Will exchange good cabinet cold rolling press for dark-room lamp or incandescent gas burners.—Address, C. A. H. Nye, 8, Lyndhurst-square, Peckham, S.E.

Answers to Correspondents.

*** *All matters intended for the text portion of this* JOURNAL, *including queries and Exchanges, must be addressed to* "THE EDITORS, THE BRITISH JOURNAL OF PHOTOGRAPHY," 2, *York-street, Covent Garden, London. Inattention to this ensures delay.*

*** *Correspondents are informed that we cannot undertake to answer communications through the post. Questions are not answered unless the names and addresses of the writers are given.*

*** *Communications relating to Advertisements and general business affairs should be addressed to Messrs.* HENRY GREENWOOD & CO., 2, *York-street, Covent Garden, London.*

*** *It would be convenient if friends desiring advice respecting apparatus, failures in practice, or other information, would call at the Editorial Office on Thursdays from* 9 *to* 12 *noon.*

PATENT.—T. RAY. As the patent was not completed, the Provisional Specification will not be published, therefore it will not be possible to say anything as to what it contained. At one time Provisional Specifications were published, whether the Complete Specification was lodged or not. It is not so now.

BELLOWS.—G. NEWMAN says he has an enlarging camera with a mackintosh rubber bellows, the folds of which stick together after it has been lying by for a time, and asks if oil or grease would be a good thing to apply. No; it would not. It would be harmful to the rubber. Rub the rubber cloth well over with French chalk each time it is put away.

PANORAMIC CAMERA.—A. DIXON asks who is the maker now of the Johnson's Panoramic Camera that takes flat plates. The camera is not made by any one at the present time, and has not been for many years, though it is a very efficient apparatus. Now and then one is to be met with second hand, but not often. We have seen two or three at Stevens's Sale Rooms during the past few years.

ELECTROTYPE.—T. DALMAN. The form of battery most in use for depositing copper on reliefs is the Daniell's, or the Smee Cell. There is not much difference in their cost, though the first-named is a little the cheaper. The latter is, however, the cheaper in working, and it is also less trouble to keep going. The Smee is the most generally used by practical electrotypers who do not possess a dynamo.

CARBON.—J. CLARK. There is no necessity to use the fixing bath of alum in carbon printing so far as the action of light is concerned; the print is *fixed* as soon as it is developed. The action of the alum bath is to render all the partially soluble portions of the picture completely insoluble, and also to assist in the removal of any bichromate that may remain in the film or paper, as that would give it a more or less yellow tint.

MOUNTING.—S. SIMS. If the starch (Glenfield) does not stick, it is because the paste is not rightly made. Mix the starch, cold, in a little water, in as stiff a paste as can well be made. Then add boiling water from the kettle, with constant stirring, till the paste again becomes thick and transparent. When cold, beat up with a spoon, and it will be ready for use. Thus prepared, there will be no difficulty in getting it to stick.

PHOTOGRAVURE.—C. GRANT. So far as we are aware, there are no patents in existence with regard to photogravure (intaglio plates). The method by which the Goupil plates are produced is open to all to work if they know the way. This method has not been published by the firm, though several methods have, all of which are said to be that employed. However, Goupil's method or methods, whatever it or they may be, are not patented.

LENS.—M. FOX. The sketch shows that the lens is one of the old-fashioned triplet form, evidently a copy of the Dallmeyer triplet, made in France. It may be, and probably is, a very good photographic tool, as we have seen some bearing the same name that were very good indeed; but others were a long way from being of equal merit. The merit of the lens can only be arrived at by a trial. If it is good, it is cheap at the price mentioned; if it is not, it is dear.

WET COLLODION.—A. J. In reply to your query, there is, we think, very little doubt that ultimately gelatine plates will take the place of collodion for photo-mechanical work generally; but, as a matter of fact, at the present time all the principal houses adhere to collodion, and affirm that they cannot get such good results with gelatine as they do with wet collodion, although the negatives on the most suitable dry plates look as good as those on wet. Some complain that there is a difficulty, however, now in getting really efficient wet-plate workers, and that will help dry plates.

TERMS OF ENGAGEMENT: HOLIDAYS.—ALPHA writes: "I have been an articled pupil of —— for two years, and the term expires next month, when I shall be seeking an engagement in a first-class house as principal operator. Will you please tell me the custom of the profession as to the terms of engagements, whether monthly or yearly, and the length of holidays a chief operator is entitled to?"—The terms of engagement are as per arrangement; they may be be weekly, monthly, yearly, or for a number of years. As regards holidays, they are also as per arrangement; some houses give one time, some another, and some no holidays at all.

ENGAGEMENT.—PRINTER says: "I made an engagement with a photographer, as a printer, at so much a week, but it was arranged that I should go a month on trial. At the end of the month, when I took my fourth week's salary, I was told my services were not required any longer. Ought I not to have had a week's notice, and cannot I recover a week's wages in lieu of it?"—No; the engagement was for a month, and it expired at the end of that time. It would, however, have been an act of courtesy on the part of the employer if he had intimated to our correspondent earlier that the engagement would terminate at the end of the month—that is the usual custom.

BURNISHING.—Y. Z. (Worcester). Carbon prints can be burnished with a hot burnisher provided they are perfectly dry at the time. The same lubricant may be used as for albumen prints. The trouble has been caused by the prints not being quite dry.

EXHIBITING PORTRAITS.——A. J. W., who has exhibited a portrait of a young lady in his window without permission, has been requested to remove it, and writes thus: "With reference to enclosed copies of correspondence, I should like to ask the following questions, and if you could answer same should esteem it a boon, I being a young beginner in business. 1, Could they, in this case, have obtained legal redress? 2, Have proceedings ever been taken against any photographer under the same conditions? 3, Is it usual to obtain permission before exhibiting ordinary every-day portraiture?"—In reply: 1, Yes. 2, Yes, in the case of Pollard *v.* The Photographic Company. 3, Certainly, by all respectable houses.

COLLODIO-CHLORIDE PAPER.—ST. CLAIR (Jersey) says: "In using Paget Prize C.C. paper, I find that using an alum bath before toning—about two ounces of alum to water one pint—removes any chances of the paper 'chipping,' and to a great extent does away with the cracks which makes the paper so difficult to use for general purposes. The alum bath is not given in the instructions for using this and similar papers. I should therefore feel obliged if you would inform me in your next issue if the alum will in any way prejudicially influence the permanency of the prints? I should also like to know if any of your readers have tried the above bath with C.C. paper, as I feel sure that they will find it greatly advantageous to doing good work on, in my humble opinion, one, if not the finest, printing processes of modern photography."—We should like to have the experience of some of our readers who may have tried the alum bath with C.C. paper.

*** Several important communications unavoidably held over.

PROPOSED MEMORIAL TO THE LATE J. TRAILL TAYLOR.

SIR HENRY TRUEMAN WOOD, M.A., took the chair at a meeting, called to consider the question of establishing a memorial to the late Mr. J. Traill Taylor, which was held on Friday evening last at Anderton's Hotel. Among those present were: Mr. T. R. Dallmeyer, Mr. A. Haddon, Mr. E. W. Foxlee, Mr. W. D. Welford, Mr. E. Clifton, Mr. E. J. Wall, Mr. P. Everitt, Mr. and Mrs. Snowden Ward, Mrs. S. M. Massey, Mr. R. Ward, Mr. L. E. Morgan, Mr. C. R. Rowe, Mr. Child Bayley, Mr. Sebastian Davis, Mr. Thomas Bedding, Mr. G. W. Tottem, Mr. A. Rayment, Mr. Rudowsky, Mr. J. A. Sinclair, Mr. R. P. Drage, ond others.

The Chairman expressed the pleasure it gave him to preside on that occasion, and dwelt upon the readiness the late Mr. Taylor always exhibited in placing his knowledge and experience at the service of photographers.

Mr. A. Haddon moved a resolution that, in the opinion of the meeting, a memorial to the late Mr. Taylor should be established, and the support of photographers invited to it. Mr. Foxlee seconded, and the resolution was carried unanimously.

In the course of a subsequent discussion, suggestions were offered as to the form the memorial should take—a bust, a scholarship, a Taylor medal for advances in photographic optics, or a medal for general photographic advances, being mentioned. Most favour, however, appeared to be accorded to the idea of Mr. Haddon, that Mr. Taylor's memory would best be perpetuated and photography served by the institution of an annual "Traill Taylor" lecture or series of lectures on photography.

The meeting subsequently proceeded to the election of an Executive Committee to carry the resolution into effect, the following being chosen: Mr. Foxlee, Mr. Haddon, Mr. Everitt, Mr. Rayment, Mr. Drage, Mr. Dallmeyer, Mr. Wall, Mr. Bedding, Mr. Snowden Ward, Mr. Briginshaw, Mr. Pringle, Sir Henry Trueman Wood to act as Chairman, and Mr. A. Mackie, of 3, Upper Baker-street, as Hon. Secretary and Treasurer.

A vote of thanks to the Chairman concluded the proceedings.

CONTENTS.

	Page
TRANSFERRING FILMS WHILE WET	817
DOUBLE-COATED FILMS FOR PROCESS WORK	818
WORKING NOTES ON COLLODION EMULSION. By W. B. BOLTON	820
COLOUR SCREENS IN PRACTICAL PHOTOGRAPHY. By F. H. BURTON	821
IRON PROCESSES FOR COPYING DRAWINGS, &c. By THOS. A. SCOTTON	822
PHOTO-CHEMICAL NOTES. By G. E. BROWN, A.I.C.	823
THE PHOTOGRAPHY OF THE FUTURE. By HECTOR E. MURCHISON	823
PHOTOGRAPHIC MORDANTS. By JEAN HELOUIS AND CHARLES DE SAINT-PERE	824
THE HAND CAMERA AND HAND-CAMERA WORKERS. By S. L. COULTHURST	825
DOES MARRIAGE CAUSE LIKENESS? GEO. G. ROCKWOOD	827
NEWS AND NOTES	827
MEETINGS OF SOCIETIES	827
FORTHCOMING EXHIBITIONS	830
CORRESPONDENCE	830
EXCHANGE COLUMN	831
ANSWERS TO CORRESPONDENTS	832
PROPOSED MEMORIAL TO THE LATE J. TRAILL TAYLOR	832

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*January* 4, 1895.

THE LANTERN RECORD.

CONTENTS.

	Page
LANTERN NOTES AND NEWS	1
SPECTRUM OF THE LIMELIGHT	1
PRINTING DIRECT AND IN THE CAMERA. By W. B. BOLTON	1
THE SEARCH LIGHT. By RADIANT	3
LANTERN MEMS. By G. R. BAKER	4
PROJECTED PORTRAITS. By LIME-LIGHT	5
THE ANAGLYPH. By JULIUS F. SACHSE	6
PRIMUS NOVELTIES	8
THE "PRIMUS-DRESSER" COMBINATION LANTERN	8
ADVENTURES WITH AN OIL LANTERN	8

LANTERN NOTES AND NEWS.

The newly discovered gas is to be the subject of a discussion at a meeting of the Royal Society on January 31, when Lord Rayleigh and Professor Ramsay will present their paper.

* * * * *

A Belgian inventor has devised an immense lamp such as has probably never been seen before. The lamp is composed of 3000 pieces. It is 6 ft. high, and measures 3·10 ft. in diameter. It is fed with lard oil, and the consumption is said to be very small, its light being so powerful that one may read by it at a distance of 600 ft.

* * * * *

Forty years ago, says the *Journal of the Photographic Society of India*, childhood was amused with panoramas—now it is with the magic lantern; and nothing can be conceived so fascinating to a youngster as an hour spent before a well-lighted screen with its bewildering kaleidoscopic changes of colour and scene and incident. Amongst the missionaries to the heathen out here nothing is so effective as Bible stories, such as Joseph's history, Abraham's sacrifice, the Parables—indeed the innumerable incidents of Bible history told before the screen. The natives crowd to such exhibitions and listen to the recitals with an absorbing interest, so that the magic lantern is the coming boom in India. I know of one missionary lady who devotes most of her leisure to slide-making, and excellently well it is done; and during a recent holiday in the hills I was one of a large and appreciative audience which was very nearly disappointed of its magic-lantern scenes by the lantern refusing to burn properly. The relief on our faces was great when a Lepcha convert, beaming all over, rushed up with another and a better lantern, and saved us from darkness and dismay.

* * * * *

Messrs. Archer & Sons, of Liverpool, have laid down cable for working the "Dot" electric arc lamp in their lanterns on their own premises, and are able to obtain a light of from 1000 to 2000 candle power in a few minutes. In their experience the electric light shows up the weak points of a slide too clearly. Electricity also drives one of the lathes in their work-room. Messrs. Archer are introducing a new portable "Ideal" lantern, also a novel form of bellows biunial. Among their new slides are sets illustrative of those fine Cunarders, the *Lucania* and the *Campania*.

Before the members of the Paisley Photographic Society on Thursday, December 27, Mr. T. N. Armstrong, of Glasgow, lectured in a graphic and interesting manner, and described the river Clyde, from its beginning as a trickling mountain rill till it reached the sea. The development of shipbuilding and interest in yacht-racing, and the picturesqueness and historical interest of the scenery along the banks and in the Firth were dealt with in an attractive manner, and Mr. Armstrong interspersed his remarks with humorous references and interesting statistical statements. The lecture was illustrated by over a hundred views exhibited by means of a powerful lantern manipulated by Mr. D. B. Jack, one of the members.

* * * * *

Messrs. Newman & Guardia, of 92, Shaftesbury-avenue, are issuing a seasonable supplement to their catalogue. This gives full illustrated particulars of their well-known enlarging camera, the lantern-slide reducing camera, and other useful items of apparatus.

* * * * *

Mr. Alfred Underhill, of 32, Clarendon-road, West Croydon, sends us his extra supplementary and clearance sale list, also his special list of chromo-litho slides. The bargains and slides are varied and cheap.

SPECTRUM OF THE LIMELIGHT.

In a recent number of the *Physical Review* is an account of experiments made by E. W. Nichols and Mary L. Crehore on the effect of prolonged ignition of lime on its radiation. It is shown that lime possesses the property, long since known to exist in the case of other oxides, of luminescence by heat. In other words, its radiation, when freshly ignited, is one corresponding to a temperature very much higher than that to which it is actually raised. This has been known to be the case with magnesia, when the incandescent oxide is produced by burning magnesium ribbon. It has been shown by Nichols and Franklin that freshly ignited cylinders of lime were whiter, *i.e.*, relatively stronger in the shorter wave-lengths than any other artificial source of light except magnesium. In its final state of incandescence the limelight was found to fall decidedly below the electric arc, being relatively about twice as white in the blue as gaslight. The authors of the present communication now notice that a lime cylinder, after having been held in a state of incandescence for several hours, would, upon being allowed to cool, recover its properties to a marked degree, and act upon reignition as though it were a fresh lime. The power of recuperation did not, however, appear to be uniform in the various specimens tested. It was much more complete in some than in others.

PRINTING DIRECT AND IN THE CAMERA.

The question has often been discussed as to whether the better result is obtainable as regards sharpness by direct contact printing or by the use of the camera, and the verdict has been given in favour

of both methods, though, probably, the variance in opinion arises from difference in the conditions of working. From experiments made some few years ago, I am convinced that, given a good negative, at least as good positives may be made from it by the camera as by contact printing; indeed, in the majority of instances, if the work be performed carefully, and as it should be, I think the advantage will be distinctly on the side of the camera.

If our plates, both for negatives and transparencies, were prepared upon optically true glass, or even if the surfaces were approximately flat, as in the case of plate glass, the result might probably be different, for then there would be nothing to prevent the reproduction of the minutest detail and most perfect sharpness of the original negative; but, so long as our films are as they are, I maintain that the camera method of working will be the better. Obviously, it is impossible to improve or to increase the sharpness of the original negative; but, as it exists, it can be reproduced in all its original perfection by means of a suitable lens, whereas, when two more or less uneven surfaces are brought together, it is impossible to expect perfect contact in all parts, and therefore complete sharpness. Where preference has been given to the contact method, it can only have been because an unsuitable, or, for the purpose, defective lens has been employed or carelessness exercised in focussing.

Of course, in cases where the only work of this class is in the form of lantern slides from quarter-plate negatives taken on purpose, it may be a question as to the advisability of resorting to the more troublesome plan of copying in the camera when contact in the printing frame is so easy. On the other hand, when lantern slides have to be reduced from larger negatives, or opals and bromides have to be enlarged from smaller ones, the camera becomes an absolute necessity; and, when the means are provided for reduction and enlargement, it is equally easy to work on the same scale, and therefore an additional trouble is involved. But personally I am of opinion that, even in the case of quarter-plate negatives only, it will be found really advantageous to use the camera.

This will be more especially the case when collodion plates are used, in fact with wet collodion it is almost as essential to adopt the camera for working to the same scale as it is in reducing or enlarging, owing to the impossibility of bringing the two surfaces into actual contact. Even in the case of dry plates, especially if prepared from washed emulsion, the surface of the collodion film is so extremely tender that it is very difficult to avoid damaging it in the course of printing. It is true a thin mask of paper may be interposed, as is frequently done, to prevent actual contact, but in the case of a lantern slide this must detract to some extent from the exquisite sharpness of the original, although, for larger work or for pictures that are not required to undergo enlargement, the difference is not appreciable. On the whole, I incline to the view that, in order to obtain the most perfect collodion transparencies, the camera is a necessity, for the pressure of the minutest dust speck into the tender film will produce a pinhole that becomes painfully obtrusive when the transparency is thrown upon the screen.

But, in order to get the necessary sharpness in the reproduced picture, it is absolutely necessary to employ a suitable lens, and this is, in far too many cases, not attended to. It is customary to advise the amateur that the lens which takes the negative will do equally well for enlarging or reducing it, but that this is far from being universally true, as I shall endeavour to show. Take, for instance, the single lenses used with so many of the cheaper quarter-plate cameras. Even if stopped down sufficiently to give the requisite sharpness in the centre of the plate, the definition falls off very rapidly towards the edges, and to obviate this loss of definition it is necessary to resort to a stop of such a size as to increase the exposure beyond all reasonable bounds. Portrait lenses of the ordinary Petzval type, although for portrait purposes capable of working sharply over a large area, suffer from the same fault when applied to the purpose under discussion, and require a considerable amount of stopping down to arrive at anything like evenness of definition. Some of the newer forms, specially constructed for flatness of field, answer better in this respect, and I believe that many of the professional lantern-slide makers adhere solely to this class of lens.

But undoubtedly the best all-round lens for the purpose is one of the rapid rectilinear type now so generally employed. With full aperture it will give the most perfect sharpness, and, if selected of a size or two larger than required for the plate in use, it will define equally up to the very edge. The whole matter is a question of compromise between quality of definition and length of exposure. Where gelatine plates are employed their greater rapidity permits of a smaller stop being used, and so the actual form of lens is not so much a serious trouble; but for collodion plates it is desirable to use the quickest and most perfect type of lens obtainable.

It is scarcely needful to impress upon my readers the necessity for accuracy in focussing, for, however perfect the objective may be, it must be used to the best advantage, and in the matter of focussing it is worth while to expend a little extra trouble once for all and have done with it, in the way I shall show. I will take, first, the circumstances when all the work is done to the same scale or size as the original, in which case one focus answers every purpose. Let this be secured with the utmost exactitude by means of a compound magnifier or plain glass, and let the negative, lens, and plate-holder be then finally fixed in position. A landscape negative or printed matter is scarcely sharp enough to give the very purest definition, but a good object to operate upon will be found in the well-known fly's wing, so often used for this purpose. This may be attached to a sheet of plain glass and inserted in the negative-holder, and its image received upon a second piece of plain or *very* finely ground glass held in the dark slide that is to be used for the sensitive plate, by which arrangement there will be no possibility of doubting the coincidence of focussing glass and plate. A powerful magnifier brought to bear upon the finer details of the "wing" will enable a very accurate adjustment of focus, which, once obtained, is always correct.

Where different degrees of enlargement and reduction are required the same principle can be adopted, and, though the position of negative and sensitive film will have to be altered, it is a very easy matter to make such arrangements that the focussing of each individual picture is avoided. In fact, in the manner just described the focus is obtained with the negative in a number of different positions, so as to give varying degrees of enlargement and reduction, and, by a very simple attachment to the negative and plate-carriers, we are enabled to secure, at any future time, the absolutely correct positions of each pair of conjugates without the trouble of focussing.

It will, of course, depend upon the class of work to be done how many such focussings are to be made; but, if only lantern slides are to be made from negatives not larger than $7\frac{1}{2} \times 5$, half a dozen varying in the degree of reduction from the same size to about one-third will meet every requirement. Supposing the negative and plate-carriers, or the portions of the camera that carry them, move, as usual, upon a solid baseboard, each is fitted with a perforated brass plate, by means of which the sliding portion can be fixed down, where required, to the baseboard. After each focus has been accurately obtained with the two carriers in position, and using the brass plates as guides, drill holes into the baseboard, so that the insertion of a screw or dowel will ensure the two portions of the camera always occupying the same positions, and let each pair be marked with a corresponding number. By this means, when a negative is to be reduced, ascertain roughly by the focussing glass the best position of the negative to include the necessary amount of subject, and fix the sliding portions of the camera in the nearest corresponding pair of holes, and the task of focussing is entirely avoided.

It may, and, I am sorry to say, often does, occur, that the lens itself does not work accurately to focus. If this be found to be the case, the conjugate will have to be found, as before, by actual trial, and the difference between the visual and chemical foci allowed for, and all further trouble is overcome. To do this, take, let us say, three or four plates of glass, bound together after the manner of a lantern slide, each having an insect's wing cemented to its surface in positions equidistant from the centre of the plate or the axis of the lens. By focussing on one of them, and exposing a plate, it will easily be ascertained if the two foci vary, and, if so, in which direction and how much, and, the needful allowance being made, perfect sharpness will afterwards be secured without trouble.

W. B. Bolton.

THE SEARCH LIGHT.

IT is only fitting that at "this festive season," and, after wishing my readers everything they may wish themselves during 1895, I should back up the appeals which are being made on behalf of the Photographers' Benevolent Association. Lack of support and interest is threatening the existence of the fund, as I hinted a month ago, a fact which not even the well-meant letters of the Hon. Secretary that have since appeared can explain away. The question before us is, if the Association is to be saved from extinction, how best to effect its salvation? Circulars, letters to the papers, and so forth, are, doubtless, not so potent as personal service and canvassing in getting new members and subscribers. Could not the old system of local honorary secretaryships be revived, so that a man might be enabled to personally work a town or district in search of members and subscriptions? London, for example, might be split up into four or six parts, the local honorary secretaries engaging to make a round of all the photographers in their divisions, and others, as far as was practicable, taking the provinces. Some such plan as this, vigorously promoted and carried out, is necessary to save the Benevolent and put it on the footing it should occupy. Also, as regards getting in subscriptions, would it not be practicable to have an Annual Dinner, inviting some charitable celebrity to take the chair, as is done in many other professions and trades with so much success in promoting competition in figuring heavily on the subscription list? But, above all, as Mr. Ward pleads, let us have more personal service in the good cause. Who will help?

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THE thanks of the general public and the grateful acknowledgments of the photographic profession are due to the *Star* for the courageous and outspoken manner in which it has criticised the recently resuscitated Free Portrait idea. The "Imperial Portrait Association," which most of my readers will remember was run at seaside towns by one "Charles Beresford," has risen from the ashes at that highly respectable suburb, Ealing, under the style of the Monochrome Portrait Gallery Company, which, with its promoters, the *Star* denounces in language of such glorious emphasis that I envy its author its use, and am only sorry I cannot reproduce it in this column without running the risk of getting the proprietors or the Editor consigned to the cool seclusion of Holloway Castle.

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SAYS the *Star* in reference to the new dodge: "The *modus operandi* is precisely the same as in the previous cases. Circulars are addressed to strangers, without rhyme or reason in their selection, suggesting that the Company regards the recipient as a 'suitable person' to introduce monochrome portraits in his locality. The loan of a photograph is solicited, of which an 'artistic' enlargement is offered free of charge on condition that it is shown to friends and the producers recommended 'as much as possible.' As soon as an unsophisticated young man or woman is so weak as to forward a photograph, he or she receives a printed circular, requesting a remittance for the frame in which the 'free' portrait is to be enclosed. The sum usually demanded varies from one to two guineas; but, needless to say, the picture, when received, is worthless and the frame not much better. The Monochrome Portrait Company is being directed by a person named Alfred Raines, either an American or a man who has recently come from America. There are two branches of the 'business,' one in Ealing Dean and the other in South Ealing, the latter shop having been opened but recently. We are given to understand that as many as 10,000 circulars have been posted in a single day."

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THE enormous numbers of amateur photographers there now are would deserve well of their country, and of photography, if they would make a point of warning all their non-photographic friends to have nothing to do with "free portrait" concerns, which can only thrive by the ignorance of those to whom they dispatch their circulars. I trust the other photographic papers, particularly those appealing to non-professionals, will join me in trying, as far as possible, to enlighten the public as to the true nature of these schemes.

A FRIEND writes me as follows:—

"As my attention has been called to a correspondence in your columns with reference to a blackballing incident, I thought your readers might be interested in an apparatus recently invented by myself, fuller particulars of which I shall be glad to supply to you for publication as soon as the patent formalities have been complied with.

"My invention has for its express object the prevention of such an incident as that which occurred at a recent meeting of the Royal Photographic Society, and is based on the very simple principle that, if the balls on both sides of the box roll into a common receptacle, it will rest with the Secretary of the Society to determine whether the individual is elected or not, since both the black and the white balls will be mingled together. I propose to issue ballot boxes constructed on this plan very shortly, and hope to be able to provide same with an electrical arrangement by means of which those members who dare to vote against a candidate shall, at the moment of so doing, receive a shock, the severity of which, to anything short of electrocution, can have been adjusted beforehand.

"It has been suggested that with the instrument should be supplied blank forms of a statutory declaration, to be filled in by the candidate, to the effect that in his own estimation he is a fit and proper person to become a member of the Society, that he is a person of the highest merit, socially, morally, politically, physiologically, psychologically, and artistically, and that his work, in the particular branch of art fostered by the Society, is equalled by few, and excelled by none."

My friend's suggestion is evidently meant to be regarded *pour rire*; but there is, nevertheless, far more reason and sense in it than in some of the ideas that have been published by the friends of the gentleman who woke up one morning recently and found himself —blackballed!

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WHILE on the subject of inventions I cannot resist the temptation of quoting the annexed letter by that sprightly genius, Mr. Hiram Maxim. It tells us how some inventions are invented. I wonder if that much-invented aspiration, colour photography, was ever invented in the same way:—

"In regard to the Mercer flying machine, a story is beautifully and ingeniously told in a Paris edition of an American paper, with all the realistic circumstances possible; it is certainly very interesting reading.

"I have received a communication from the States, and so happen to know some of the particulars which have not as yet appeared in print.

"The machine was not built by a young man twenty-one years of age, as stated, the builder being about thirty-five years of age. He commenced his experiments at eleven o'clock at night, not in New Jersey, but in Ann-street, New York. The apparatus which he employed in building this machine was as follows:—A pint bottle of 'Mountain-dew' (whisky), four ounces of 'Nigger-head' tobacco, one black pipe, one goose quill, one small bottle of ink, and half of a reporter's note-book. No electricity was employed on this occasion, the light being derived from a tallow candle stuck in the neck of a bottle. The machine was completed and delivered before daylight the next morning, and by sunrise it was flying all over the country, the total cost being a penny a line."

But, if all we read of Mr. Maxim's countryman, Mr. Thomas Alva Edison, be true, many of that gentleman's "inventions" owe their source and origin to circumstances hardly less curious and unscientific than those so amusingly suggested by Mr. Maxim. A recent issue of my excellent contemporary, *Invention*, contains some sharply pointed remarks anent several of Edison's "inventions." What we of the photographic world are possibly more immediately concerned in is to know how much of the kinetoscope, which is just now being so severely boomed, is due to the "inventive genius" of Edison? A significant feature of the boom is that the photographic press has not been invited to "do" the kinetoscope. On the whole, perhaps, the omission is a wise one.

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I AM pleased to notice that Mr. G. R. Baker has been protesting against the *risqué* character of the subjects of many of the vast numbers of American stereoscopic slides that are being introduced into this country just now. I myself drew attention to the same

thing in these columns a few months ago, simply on the evidence supplied me from the shop windows of central London. But I fear that "worse must remain behind." It will be a lamentable thing if the renaissance of stereo-photography is to be jeopardised or discredited by the dissemination of vulgar or indecent slides, and I hope that publishers, printsellers, and others will do their best to avert the threatened calamity; for, once it became publicly thought that the stereoscope was being employed in the cultivation of pictorial nastiness and unseemliness, an eternal farewell would have to be said to the popularity of stereo-photography.

* * * * *

THAT dreadful word "photogram" recently formed the subject of an interesting note in the ever-green and always welcome *Notes and Queries*. Says the writer W. E. H.: "The gradual adoption of 'photogram' to signify a picture made by light has been proceeding for many years, and, though it has recently received a spurt in England, the attempt is not new. In December, 1866, in the *Scientific American*, the use of the word was strongly advocated by the Rev. A. C. Kimber, and a discussion arose in which several journals, including the *New York Times*, took part. Some years later the word was given in a supplement to Webster's *Dictionary*, and more recently the American *New International Dictionary* gives it as a standard word. Some two years ago the *Canadian Photographic Journal* commenced to consistently use the word 'photogram,' and a year ago an English journal called the *Photogram* made a point of using it. One of the most important firms of photographic book publishers also use it in all their publications. Several photographers and photographic material dealers in England use it either occasionally or regularly, and such journals as the *Sketch*, the *Optician*, and others, use it occasionally as an alternative for the older form 'photograph.'" If I am not very much mistaken, the word came under discussion in the pages of this JOURNAL anterior to the date first above mentioned by "W. E. H." The chances of the word ever securing but a limited degree of adoption are, of course, slight, and it will probably ever remain merely a philological curiosity, notwithstanding the highly distinguished journalistic and other patronage it enjoys. Personally, I see no objection to its use; but, if the word "photograph" conveys, as it undoubtedly does, a clear meaning to everybody, why disturb it?

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IT having been freely stated that, in consequence of my failing to have it all my own way in the management of the "A. M. S.," the etiquette of the situation demands that I should henceforth resign my membership, I beg to state that I shall do no such thing. Nary bit, boys! It's what my enemies want, of course; but they must remain unhappy, for they'll not get it! They may retort: "Who cares twopence whether you resign or whether you don't?" but I shall trump that card by not speaking to 'em; so there!

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THE "A. M. S.," at the end of its second year's existence, presents a flourishing appearance. The photographic work it has accomplished during the past year was of an extensive, peculiar, and useful character. The balance-sheet is of a satisfactory nature. The same efficient officers who have hitherto guided its fortunes will remain perpetually at their posts. The "A. M. S." is composed of members of the Royal Photographic Society, the Photographic Club, the Camera Club, the Linked Ring, the London and Provincial Photographic Association, the North Middlesex, the Hackney, the North London, Birmingham, Liverpool, South Manchester, Croydon Microscopical, Woodford, Midland Camera, Newcastle, and other photographic Societies. It has, in fact, its own affiliation scheme Its rules are a masterpiece of construction: they are unalterable; while in many more respects the "A. M. S." is a model to other photographic societies. There are no vacancies. RADIANT.

LANTERN MEMS.

VERILY man is an inventive animal, or, shall I say, imitative, for an invention to my thinking is something more than the majority of "improvements" that can be protected by the grant of Letters Patent. I am led to think thus after a visit to the library of the Patent Office, where I had occasion to make reference to some patent specifications, and I was so struck with the number that referred to the optical lantern that I determined to devote two or three hours one evening to the analysis of them, so that anything special could be described in these columns.

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THE preliminary and necessarily hasty view gave promise of enough special matter to warrant my devoting some of the small amount of leisure at my command to the purpose, for there were mechanically fed lanterns, multiple dissolving-view apparatus for cycloramic projection, as well as several hopper or magazine slide-carriers, and some other apparatus I do not remember to have seen specially described, and certainly not illustrated before.

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AMONG the class of mechanically fed lanterns for which patents have been granted are two in the name of Mr. Henry Simpson, of Liverpool, designed that one action shall successively place in position in the lantern front the slides that have been previously placed in proper order in a series of holders, to operate the dissolving-view apparatus, and rotate the limes. In the earlier of the two patents the chain of carriers holding the slides in position hung on a square spindle, and required an independent horizontal movement, but the second overcame this by modifying the condenser lens so that the normal position of the slide, "instead of being, as usual, close in front of the condenser, is in advance of the latter by a distance somewhat greater than the height of the slides, so that the slides can clear the condenser as they rotate into position."

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LANTERNISTS will see from the part in inverted commas that the removal of the slide so far from the condenser limits the covering power, and thus a very small slide must be used in proportion to size of condenser, or else a great amount of light lost. I fear, therefore, the arrangement has not yet assumed a practical shape. The same remark applies to another patent "made in Germany," and for which F. H. Klodt is responsible; and, if Mr. Editor could see his way to reproduce the illustration in this specification, I think it would be amusing to many lanternists. It is always somewhat difficult to describe an apparatus without drawings, and to a busy man it would be invaluable to be able to take in at a glance improved or new apparatus, or a patented article or instrument described in a specification.

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M. KLODT'S patent claim is for a lantern containing a candle with reflector behind, and shows very simply the rays passing on, in parallel lines, to a flat mirror (removable), also inside the lantern body and the ordinary front with condenser, stage, and objective, interchangeable in the top and front of lantern, for either vertical or direct projection. Of course, putting the mirror inside the box makes the luminant far too distant to be of any service, even supposing the drawing is only to show the principle, with the candle representing any light; but without condensing lenses, I fail to see how the apparatus can be of use. How a patent of this kind could possibly be expected to pay in England I cannot understand, and it seems to me, without desiring in any way to curb the ambitions of inventors, that before they go to the expense of having patents elaborately drawn up and illustrated by patent agents, who naturally do not wish to throw cold water on *anything* patentable and so lose a client, they would be wise if they first submitted in confidence their scheme to an optical lantern-maker or practical lanternist.

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I COULD fill up much more than the usual space occupied by these "Mems." if I enumerated all the curious apparatus in connexion with optical projection that have been patented during the last year or two, but I will content myself for the present with winding up these references by giving a short description of the compound projection apparatus, patented by Mr. Joseph Train, of Melbourne.



Phototype, F. Thévoz & Co., Geneva. *Negative by Thos. Fall.*

BRET HARTE.

THE
JOHN CRERAR
LIBRARY

It is described as "Improvements in the construction of Panoramic Scenes and method of and apparatus for producing the same." In the preamble is set forth the fact that ordinary panoramas, or, as mostly called now, cycloramas, are most costly to produce, whereas lantern slides in connected series to represent a panorama could be produced for much less, and consequently changed more frequently. They would be shown from a series of lanterns placed in the centre of the circular building above the platform on which the audience viewed the picture (or series). In the illustration accompanying the specification twelve lanterns are grouped, but it will be obvious that the number would have to be increased or decreased according to the size of the building and the number of sections forming the cylindrical screen.

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A suggestion is made that these sections of screens should be "curved or approximately curved," so as to agree as to radius with the distance from the screen. Whether these sections would detract from the illusion of a continuous panorama, and if each successive lantern could be adjusted for coincidence at vertical edges of each slide when projected on the screen, will depend on proper construction of apparatus; but, if the main idea was feasible, no doubt optical correctors of cylindrical or spherical cylindrical form could be adjusted to each lantern front or stage to produce equal sharpness of definition and brilliancy on a cylindrical-shaped screen.

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It was a matter of light, more light, at the Camera Club on the occasion of Mr. Davenport reading his paper on *The Electric Light applied to the Optical Lantern*, for no less than six different patterns of arc lamps were described and shown in operation, besides the incandescent electric focus lamp. They were as follows:—

The Siemens Arc Lamp,	lent by	the Society of Arts.
The Brockie-Pell Lamp,	„ „	Captain Abney.
The Davenport Arc Lamp,	„ „	Mr. J. H. Steward.
The Planet Arc Lamp,	„ „	the Planet Electric Engineering Company.
The Scissors Arc Lamp,	„ „	Mr. F. J. Borland.
The Gwynne Arc Lamp,	„ „	Messrs. Gwynne & Co.
	and	
Incandescent Focus Lamp,	„ „	Edison & Swan Co., Limited.

* * * * *

Samples of carbons were projected on the screen showing the shape assumed by the point when burning with direct, alternating, and rectified currents, and illustrations were given as to the proper position in which the carbons should be placed to obtain the utmost benefit from the light when employed for optical projection. A biunial lantern was also employed to show the difference in illumination between limelight and the electric arc light as produced by the Davenport lamp. The oxy-hydrogen jet was one of the latest and best forms, and the electric lamp supplied by a direct current of seven ampères. The same optical system was adopted in each lantern front, and a disc of eight feet produced by each.

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When the limelight disc was viewed singly, it looked a splendidly white and brilliant one, but, when half of it was cut off and the opposite half of disc illuminated by the electric lantern, the limelight looked quite yellow beside it; in fact, there was as much proportionate difference in intensity between the two as between the oil and the limelight. The simple adjusting runners, with spring rising movement and clamps and lateral slide, provided an efficient means of centering the arc lamp, and the steadiness and simplicity of working of the semi-automatic Davenport lamp left little to be desired as an illuminant for optical lanterns.

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The opportunity was taken of the electric arc biunial being in position to show Anderton's lantern stereoscope, for it had previously been adapted to receive the polarisers, and with the silvered screens, and of a pair of analysers for each of the company, some very fine effects were obtained. The two dissimilar halves of a number of stereoscopic slides were projected on the screen in such a manner that they agreed for registration as to vertical height, but had a separation laterally of several inches. This, of course, meant confusion, but, when the analysers were placed before the eyes, the stereoscopic effect was positive, and the view sufficiently brilliant on an eight-feet screen for the details to be clearly seen. This instrument should find a place in colleges, institutions, and places where technical subjects are taught, besides being a most interesting addition to a lantern for home use, or wherever scientific or artistic and cultured friends meet.

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In the "Answers to Correspondents," in last week's issue of The British Journal of Photography, was one on the subject of warming slides to prevent moisture condensing when in the lantern, and the advice given is sound if there is a fire accessible for some little time beforehand, and the box can be wrapped in flannel, or some non-conducting material, to keep the warmth in for a long time, but many operators only have the slides brought to them at the last minute by the lecturer from a very cold atmosphere to a room crowded with people, and consequently somewhat vapoury. Curiously enough, I was asked a week or two ago to scheme something to overcome this, and a tin case to hold 100 slides in racks was constructed, with false bottom and air passages, that enabled the internal temperature to be raised by means of a small spirit lamp burning underneath, 20° Fahr. in five minutes, 40° in eight minutes, and 90° in fifteen minutes. If, therefore, this arrangement is found to answer practically in operating, one can take a box out of a temperature of freezing point, and in fifteen minutes (while the lantern is being set up) warm all the slides to a temperature of 122° Fahr., and, what is more, keep them at any desired heat during a two-hours entertainment, by applying or withdrawing the spirit lamp. A small metal scale thermometer could be inserted in the top, or carried separately, to show they were not getting too hot in the box.

G. R. Baker.

PROJECTED PORTRAITS.

XVII.—Mr. Walter Tyler.

The prominent position Mr. Tyler occupies in the lantern world entitles him to a place in this Galaxy Gallery. Mr. Tyler's business premises are situated in the Waterloo-road—and so are those of several other commercial houses; but that is a matter of minor importance to him—and us. The Maison Tyler is surmounted by a chaste and lofty sky-sign; it is illuminated and pervaded by Mr. Tyler himself, whose bland and beaming countenance outshines the gleaming brasswork with which his establishment is elaborately ornamented. The subject of this sketch was born early, which probably accounts for the circumstance that he is addicted to commercial early rising to such an extent that, in the words of the bard, "he takes a lot of beating at his game!" Mr. Tyler, is, in fact, a very busy man, with only one trouble, namely, that his waist has lost the slender and romantic symmetry of youth. His lantern business is of a vast and cosmopolitan nature, and he blushingly enjoys the patronage of the clergy of all denominations. This constant contact with "the cloth" has imparted to Mr. Tyler an episcopal-like air and appearance which has an impressive effect on the beholder. In the famous lantern emporium in the Waterloo-road it would be a hard task to name anything which does not there find a place. If anybody really succeeded in doing so, I believe Mr. Tyler would be angry. Mr. Tyler's success has been won by sheer industry and perseverance, but, when opportunity serves, he wisely plays just as hard as he works. For his friends and the public he has an infallible prescription guaranteed to cure all the ills to which the flesh is heir. It is: "Buy your lantern requisites of Walter Tyler, and they'll do the rest."

[Note by the Advertisement Manager:—"See here, young man you're giving Tyler a free advertisement! Please stop that kind of thing, or we shall soon find ourselves in the workhouse."]

XVIII.—Mr. Philip Everitt.

"Who's Everitt, any way?" asked the editor of a photographic paper some years ago. The question has never been publicly answered. Let i

be my task, then, to supply the deficiency. Mr. Everitt is Hon. Secretary of the London and Provincial Photographic Association. But—'twas not always thus! He has been a member of the Association for some years, and to a considerable knowledge of photography joins some debating and dialectical skill. In an argument or a row (the two terms are usually regarded as synonymous at the London and Provincial Photographic Association), he always takes a prominent part, his invariable opponent being Mr. W. E. Debenham, a distinction which the last-named gentleman frequently shares with everybody else present at the meeting. Had Mr. Everitt been living when Captain Marryatt wrote *Midshipman Easy*, I should have said that he sat for the portrait of the entertaining character who was so fond of "arguing the point" at any and every opportunity. Mr. Everitt's pet subject is the angle of view included by a lens, and he is the solitary champion of naturalistic photography at the London and Provincial Photographic Association. He delivers his ideas on one or the other of those enthralling themes with a mixture of heated emphasis and genial doggedness which is never as convincing as it is diverting, but which largely helps to sustain the character of the average London and Provincial Photographic Association discussion as a species of photographic Donnybrook tempered by good humour. In the famous fights that have figured in the recent career of the London and Provincial Photographic Association, Mr. Everitt bore a part which brought him his reward (or punishment), in the shape of the Secretaryship of the Association, to which he was unanimously elected in June last. The cares of office have neither sapped his energy nor muzzled him, and he makes a capital and untiring Secretary. He takes good and pleasing photographs, and modestly declines to exhibit them; he cherishes a ferocious dislike for "Cosmos," and is at no pains to conceal it.

XIX.—Mr. Alfred Maskell.

Unless my memory is playing me a mean trick, I can recall the circumstance that, some six or seven years ago, Mr. Maskell, at the Camera Club, read an elaborate and exhaustive paper on the chemistry of—hydroquinone! To-day he is the arch-apologist of the newest photography, which affects to regard optics, chemistry, and science generally with contempt and indifference. Even if I am mistaken in my reminiscences, the contrast implied in the comparison is undiminished, for the mainstay of the Linked Ring is interesting as illustrating the Evolution of High or Salonographic Art from quite intelligible photography. Mr. Maskell is said to have been in sympathy with those gentlemen whose peculiar artistic aspirations and ethics of picture-hanging brought them into collision with the Executive of the Photographic Society of Great Britain some few years ago. The malcontents deserted the old Society; but Mr. Maskell, not being a member, is alleged to have had a consultation with a policeman, and then to have exercised the Englishman's prerogative of airing his grievances in the *Times*. With Mr. Robinson and Mr. Davison he founded the Linked Ring and the Salon; and his is probably the individuality that imparts cohesiveness to those institutions. Profiting by the shrewd aphorism, that to be understood is to be found out, Mr. Maskell produces "pictorial" effects by pseudo-photographic means, which are as inscrutable as some of Robert Browning's poems; consequently he is successful in arousing and sustaining curiosity in his work. He "runs" the Salon with an adroit commingling of the elements of cleverness and taste in stage management which one looks for at West-end picture shows, and, in thus bidding for the support and notice of the art critics and "cultivated" persons who would not stoop to an ordinary photographic exhibition, he probably feels pride in the reflection that he is getting the eternal question, "Is Photography Art?" answered affirmatively by his patrons. He takes himself and his mission seriously, and so do some, but not all, of his colleagues. He writes and talks clearly and intelligibly on "Art in Photography;" but that is a disease with which others besides himself are afflicted, so that there is nothing in it to brag about. Fortunately, these remarks do not apply to his photographs, so that, as long as he and a few others are sensible enough to go on producing "things" which nobody can understand or make out, Mr. Maskell's influence will be maintained and people will support the Salon. Personally, he is courteous and conciliatory, which is a risky policy to take nowadays if one is desirous of creating an "effect." Politeness shows you to be quite an ordinary (or amiable) person, whereas only really superior people are rude or repellent.

XX.—Mr. J. S. Bergheim.

It is only about two years and a half since Mr. Bergheim first began to adorn the walls of English photographic exhibitions with his camera work. In that short space of time he has made a reputation in photography—and other things. Rumour says that in Vienna, where he resides, he ranks as a millionaire, and it is not surprising, therefore, that the Viennese critics should accuse him of being the founder of a new school of photography. He has two styles—the dreamily diffused, and the decidedly defined. By both methods he makes most delightful portrait, figure, and group studies, of ambitious aims, and so, in the matter of focal treatment, wilily runs with the hare and hunts with the hounds. He is, consequently, a member of the Linked Ring and the Royal Photographic Society, and shows work at both their exhibitions. He once spoofed the entire photographic world by means of a portrait transparency backed up with blotting-paper, which we all took to be a work produced by different means. He thus laid himself open to being constantly suspected of having other jokes "up his sleeve." He cultivates the imitation of painters' work with great assiduity, and is an adept at handling a lens with highly idealistic results. He enjoys, it would seem, the annual tenancy of the further wall of the Dudley Gallery, and personally pervades that apartment in the early days of the Salon Exhibition. His latest eccentricity was to convert a plain-looking female into a *spirituelle* beauty by employing, presumably, a highly astigmatic objective. It is his own fault if he is regarded with a certain amount of amused curiosity, and if, next autumn, photographic society will be less concerned with his newest photographic work than with his latest photographic joke. It will possibly be some time before he is wholly taken so seriously as he may wish to be.

Limelight.

THE ANAGLYPH.

[Photographic Society of Philadelphia.]

Ducos Du Hauron, the noted French photo-scientist, whose researches and discoveries in the field of photographic optics are well known to most all students of practical and theoretical photography, a short time ago exhibited before the *Société Française* a number of pictures to which he gave the name of "anaglyphs." These prints were prepared by a novel method, and involved a new principle incident to the production of photo-stereoscopic effects.

Primarily, they were produced by the application of well-known principles of orthochromatic photography and the use of colour filterers, which, in connexion with polychromatic positives, culminated in the curious and interesting results shown to the Society, and, when viewed under proper conditions, produce a stereoscopic effect remarkable for it high relief and aerial perspective.

On the contrary, when the print is seen under ordinary conditions it has the appearance of a confused blurr, caused by a *cliché* being printed in two colours, one over the other, but without any attempt to register the superimposed impressions.

The word "anaglyph" is derived from the two Greek words meaning *above* and *to cut, i.e.*, to cut in relief, and in ancient sculpture was a term applied to chased or embossed work on metal. In the present instance Du Hauron has used it to denote simply a photo-stereoscopic effect.

As will be seen by an examination of the specimens here shown, viewed under ordinary circumstances the specimens seem to be nothing more nor less than a confused mass of blue and red ink, one picture printed upon another in a different-coloured pigment.

The inscription calls this blurred image, or "Wirr-warr," as a German scientist aptly calls it, "a View of the Archæological Museum in the Trocadero, Paris."

Now take this same nondescript poly chrome and view it in a strong light through a pair of spectacles, where one glass is red and the other blue; the result is magical; we have a black picture before our vision, wherein the stereoscopic effect is marvellous. The column in the centre stands boldly out, the sculpture has taken shape, the bas-reliefs, cameo-like, embellish the sunken panels, while the eye wanders down the long corridor, which ends in a graceful curve in the distance. Such is the anaglyph.

Now take another glance at the ordinary photograph from the same standpoint, and remark how flat and ordinary it looks in comparison with the wonderful depth of the anaglyph.

Ducos du Hauron, in a letter to his friend Demole, in Geneva, states that, according to his latest experiments, an anaglyph composed of two colours only, and seen with a bichromatic eyeglass, the colours of which are suitably chosen, is capable of producing upon the organ of sight a sensation of colour more complete than that which seemingly ought to result from the duality of its constituent elements.

Thus, in practice, in order to produce the red plate, it is sufficient to use a phototype obtained by the intervention of a medium green, and for the blue plate one obtained by the intervenient agency of a medium orange-

red. In consequence of a curious illusion the eyes, equipped with a red and blue glass, seem to perceive, in the charming picture which results, not only the tints shading from the red to the blue, but also those from each of these colours, or even yellow, which, nevertheless, is absent. The effect becomes more pronounced when for the ruby-red eyeglass a very dark yellow glass is substituted. It is, nevertheless, advantageous to moderate the difference between the tint of this yellow glass and that of the monochrome which it is destined to efface for the left eye. If, for example, madder-lake be used for the printing colour instead of vermilion, which has thus far been employed for the purpose, red margins would appear in the outlines of the image, rendering somewhat difficult the perception of the relief.

Experiments thus far have failed to show that any sufficient advantages were to be gained to justify a recourse to Du Hauron's original method of photography in three colours; that is, by an addition of a third plate produced through the medium of a violet light, thereby producing the yellow monochrome appertaining to the perspective of the right eye.

Du Hauron goes on to state that it seems to him that until something better is discovered one should be limited to putting into practice the empiric law which he has already given, namely:—

"Take the phototype of the red with the intervention of a medium green, and that of the blue with the intervenient agency of a medium orange-red. It will be best," Du Hauron goes on to state, "to employ orthochromatic plates; for example, for the phototype obtained with the medium green, plates of what are known as 'Light series A,' sensitive to yellow and to green, and for that obtained with the medium orange-red plates of 'Light series B,' sensitive to yellow and to red."

It is needless to say that in the anaglyphic process all idea of instantaneous exposures or snap-shots is out of the question.

Dr. E. Batault, an eminent Swiss scientist, in commenting upon the optical problems involved in the production of the anaglyph, gives the following explanation of the scientific features embraced in this special branch of photo-stereoscopy, viz.:—

It has been known for a long time that the sensation of relief and aerial perspective is due to bi-ocular vision. Both of our eyes, in fixing an object, do not see it at the same angle, and accordingly not exactly in the same manner, and it is the sensorial superposition of the two pictures thus obtained which gives rise to the idea of depth.

The general problem of stereoscopy consists, then, in presenting to each eye the picture of an object as it would see it, and from the cerebral or subjective superposition of these two pictures will arise the impression of real relief of the thing represented. But just here comes a slight difficulty; if we present to our two eyes two pictures slightly dissimilar, for example, two photographs taken from two points as far apart as the eyes are distant from each other, each eye will see, not only the picture corresponding to that which it receives of the reality, but also the two at once, because of the extent of the field of vision.

Moreover, if the left eye fixes the centre of the left picture, the right eye immediately converges toward the same point, instead of directing itself toward the centre of the right picture. If we suppose, as is necessary, that the distance between the centres of the two proofs be equal to that between the eyes, it will be necessary, in order that each eye may regard the corresponding point in each of the pictures, that the view be unbounded, for in that case the optical axes are parallel. Now, the eye contains an optical apparatus, the crystalline lens, which does not admit steady focussing for all positions, but which, on the other hand, has the wonderful property called *accommodation*. This gives an instantaneous and automatic focus for a certain distance, and it calculates that distance in a mathematical, trigonometrical manner, the power for which is furnished by the convergence of the eyes.

The vision consequently is caught between two alternatives equally defective; either each eye is directed towards the centre of each of the pictures, in which case we see indistinctly, because, the optical axes being parallel, clearness exists only for objects at a distance, or we see distinctly; but in the latter case the two eyes are directed upon but one of the two photographs.

In order to obtain at the same time a distinct view of a single picture by each eye, an artifice must be employed. The ordinary apparatus known under the name of the refracting or Brewster's stereoscope solves this problem for us. Indeed, by interposing between the eyes and the proof two prisms, ridge to ridge, suitably choosing their angles, one can have the virtual superposition of the different points of the two pictures, and in consequence the relief, while allowing the eyes to converge to the same degree as in ordinary sight, precisely the result sought. The angles of the prisms may vary within certain limits, for an exact accommodation may be had by varying their distance from the picture. By this process there would be seen, in spite of all, three pictures: a middle one in relief and two plates. These last two maybe destroyed by placing between the two prisms and perpendicular to the proof looked an opaque partition limiting the field of vision of each eye. The same end may be reached by disuniting by practice the convergence of the accommodation, that is, by provoking an artificial strabismus; but that is a slow, tedious process and of but little practicability.

After the general considerations we can define an anaglyph as a stereoscopic effect produced by coloured pictures.

Let us suppose that there are printed in two different colours, upon the same sheet of white paper, two stereoscopic designs in such a manner that their corresponding points may be quite near to each other. Let the selected colours, which should differ greatly, be blue for the left picture and red for the right. At first sight these two proofs, which, according to what we have just said, will be mingled together partly confounded, will present a mixture but little agreeable and still less comprehensible. But if we look at them with the aid of an eyeglass, having a red glass before the left eye and a blue one before the right eye, the scene changes immediately, and to the previous chaos succeeds an harmonious and satisfying impression of relief and perspective. What has happened? A fact which upon first consideration seems somewhat paradoxical or at least incomprehensible; the left eye equipped with a red glass can see the left picture only, which is blue, the second picture red, representing the other proof, becoming invisible, because a red design upon a white ground is not perceptible in red light.

For the same reason the right eye sees only the picture which is destined for it, and the stereoscopic superposition instantly follows.

The convergence and the accommodation are both satisfied, because the two designs present only an insignificant distance apart and within the limits in which the focussing is still sufficiently exact. Moreover, the pictures may be of any size, since, whatever their dimensions, they can always be printed as near to each other as desired, or, indeed, one upon the other.

In order that the effect may be a complete success, certain other conditions are necessary. The designs should be of tints sufficiently light and the glasses of the spectacles dark; accordingly it is necessary to employ an intense light, without which, considering the great absorption of light, the result is dull and dark. If the rays reflected by the designs and admitted through the glasses were absolutely monochrome, the pictures would appear in black upon a background formed by the mixture of the two adopted colours. In fact, a picture emitting blue rays only should become black in a red light, since all the rays which it reflects are arrested by the red glass; that is, it is presented under the appearance of a design without colour upon a monochromatic background. Whether this new process of obtaining stereoscopic effects, which requires the co-operation of the photographic processes and a sufficient knowledge of the theory of colours, will ever be of any practical value, is hard to foretell.

It is evidently not a process for amateurs; upon the other hand, it is one of intense interest in a theoretical and scientific point of view. For the unversed it is a curiosity. JULIUS F. SACHSE.

MESSRS. THEOBALD'S FIRST AUCTION SALE.—Messrs. J. Theobald & Co. of 19, Farringdon-road, E.C., write: "We are holding, on Tuesday and Wednesday, January 8 and 9, 1895, an immense sale by public auction, without reserve. Our scheme is to hold on the second Tuesday in every month (or, if necessary, on the Tuesday and Wednesday) a sale of fancy optical, photographic, electrical, mechanical, and other goods of a similar description, and to invite manufacturers, both in England, on the Continent, and abroad, to send us any goods they have for disposal, and we believe that this course will pay both buyers and sellers. While the majority of our goods will be absolutely new, direct from the various factories, yet we are also receiving a quantity of articles from the ordinary trade and from private persons which they wish to dispose of, so that the sale will be of special interest to everybody. Sale to commence promptly at twelve o'clock on Tuesday and Wednesday, January 8 and 9, 1895, at our Auction-rooms, 57, Farringdon-road, E.C. The goods will be on view Monday, January 7, from ten to five o'clock. The principal goods to be offered for unreserved sale comprise optical lanterns, triple, bi-unial, enlarging, and single lanterns of every description, lantern screens, stands, cylinders, and other accessories, 50,000 magic-lantern slides, 300 clocks and watches, fifty musical clocks, 100 lock-stitch sewing machines, guns, revolvers, air-pistols, opera and field glasses, telescopes, fancy hand-bags, purses, scrap-books, booklets, stereoscopes, stereoscopic slides, 2000 pairs of skates, model steam engines, mechanical toys, electric models, dolls, boxes of furniture, cubes, oleographs, several fine large musical boxes, trains, photographic cameras and accessories, melodeons and other musical instruments, electro plate, games, colour boxes, a large stock of Japanese lanterns, tools, &c."

PRIMUS NOVELTIES.

W. Butcher & Son, Blackheath.

Messrs. Butcher are once more to the fore with several cheap and handy little pieces of lantern apparatus. They are well versed in the art of catering for amateur lanternists.

Fig. 1 shows a Registering Screw, by means of which, fixed on to the under side of any ordinary lantern-slide carrier, the disc from a biunial or triple lantern can be made to accurately register.

The Tilting Screw (fig. 2) easily fixes into the baseboard of any ordinary

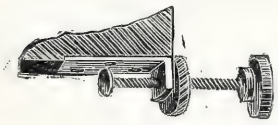


Fig. 1.

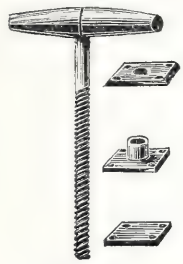


Fig. 2.

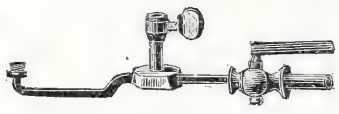


Fig. 3.

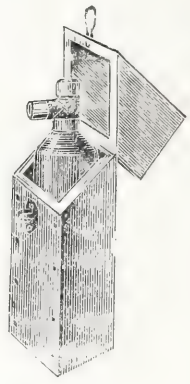


Fig. 4.

mahogany or walnut lantern, and by means of the lantern front can be raised or lowered to the greatest nicety to suit the position of the screen.

The Lantern Jet (fig. 3) for incandescent gaslight is for supporting the new incandescent gas burners in the lantern.

The Cylinder Box (fig. 4) is a smart, strong box for containing compressed gas cylinders, forming a substantial stand when in use, and also a case for transit. It is well made in hard wood, with hinges, hasp for padlock and handle.

Cheapness and excellence characterise these lantern fittings, which, like Messrs. Butcher's many other introductions, will, doubtless, be popular.

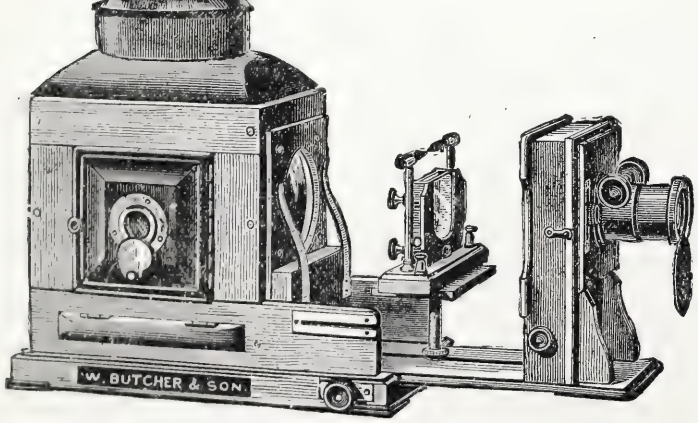
THE "PRIMUS-DRESSER" COMBINATION LANTERN.

W. Butcher & Son, Blackheath.

This is a single lantern, arranged for use with long or short-focus lenses, having a bellows extension front, and fitted with a 4-inch meniscus compound condenser, with the incandescent gaslight.

The bellows closes up to the front, leaving an open space for science purposes.

For enlarging, the lantern is made to take, and is supplied with, a 5½-inch



plano-convex compound condenser, also with carriers to take ½ or ¼-plates. The condenser will cover the whole of a ¼-plate negative and the best part of a ½-plate.

The "Primus-Dresser" is evidently a workmanlike lantern, useful, as modern lanterns must be, for a variety of purposes. The various movements have obviously been designed by one having a good practical nowledge of what is required in an instrument of this class.

ADVENTURES WITH AN OIL LANTERN.

A writer in the *Daily Telegraph* one day last week had a humorous article descriptive of some *tableaux vivants* given in the domestic circle. An oil lantern was employed to aid in the effects, with the following melancholy results:—

"My two boys and Mrs. Flinders' two girls and my own daughter, Angelica—named after me—were to do the pictures, and my husband got a magic lantern lent him to throw the light on the stage. The first picture was to be *Ajax Defying the Lightning*—not that I agree with such things myself, considering them profane—and my fool of a husband had an unpleasantness with Edwin through arguing that he ought to have thunder from my best tea-tray, which he could hit with a copper-stick after the head had been tied up in flannel. But, as Edwin (who is a good scholar) said, 'Ajax didn't defy any thunder, so what did they want thunder for?' And then my husband says, 'Whoever heard of lightning without thunder? and what odds what Ajax did if the audience had never read about him?' For my part, I didn't care two pins, but I would never allow my best tea-tray—given me with a china set by dear ma on my marriage—to be knocked about with a stick, after taking care of it for twenty-four years, and never allowing it to be used except when the minister called and stopped to tea.

"If the drawing-room furniture had not been taken upstairs and the invitations sent out, I would have stopped their goings on altogether. It was too late then, and the rest of the pictures were, I must say, instructive and improving. There was *David Playing the Piano before Saul* and *The Battle of Waterloo*—a soldier waving his handkerchief after the fight, which was supposed to have occurred previously—and *When Greek meets Greek*, where a householder was wrestling with a water-rate collector holding a demand note, and our large bath between them. And then there was *Come Back to Herrings!* an Irishman eating a fish dinner, and *The Wearing of the Green*, by my son James, dressed in a Forester's uniform, while the young woman with the Royal Licence of Music played ''E dunno where 'e are'—not that I have any sympathy with such common tunes myself, preferring 'Annie Laurie' or 'The Bellringer,' or anything lively, and only hymns on Sunday. I saw all these at the rehearsal, when my husband uncorked a bottle of whisky I had bought for the party; and when the night arrived, and the guests came round—Mrs. Poppam in a green gown, which I'm sure was her last summer's silk dyed—my husband and the boys said everything was all right, and would go beautifully. We had a high tea and some recitations, and Mr. Poppam was quite cross at finding there was to be no card-playing, as I dare say he would be, considering he won over sixteen shillings the last time. Then we seated them as best we could, after opening the folding-doors from the parlour to the back drawing-room. The gas was turned out for the sake of effect, and that fool, my husband—I can't help calling him so—commenced to muddle about with the magic lantern, which was no good at all, only casting out a ray of light like a policeman's bull's-eye. Mr. Poppam said quite loud that we had better send for twopennyworth of asses' milk, but what can you expect from a person in the bacon line, who has only been dragged up, so to speak? The magic lantern began to flutter and make hideous noises, and I distinctly heard my husband saying things which made the men laugh and the ladies giggle.

"At last the curtain was pulled aside, and the *tableau* of *Cranmer at the Stake* revealed; or, I should say, it would have been revealed if there had been any light thrown upon it; but all we could see was the shaft from the magic lantern darting about all over the place. 'Light a candle!' says Mr. Poppam, and then everybody guffawed. But, as this was a thrilling picture, and Cranmer—who was a clergyman or something a long time back, and fell out with the bishops—was to be burned for disobedience, we had put our large oil lamp in front of the platform, with a piece of red-coloured glass behind it to make the glare, for, as my son Edwin said, whenever you burn anybody or anything on a stage the fire must be all red, or the audience would not think it natural. The lamp cast a beautiful shade on the three large bundles of firewood we had ordered in to represent the faggots, and Edwin was standing behind as Cranmer—not really burning, of course, but with the ray from the magic lantern right on his face, and with a heavenly expression directed towards the chandelier. Mr. Poppam exclaimed, 'Oh, my eye!' and they were just all laughing again, when, through the boards shaking, the lamp topples over, and, before I could catch my breath, the fire was running about over the floor. Shall I ever forget that night? The women went off in hysterics; the young woman with the Royal Licence rushed to the door, and screamed 'Fire!' and 'Murder!' as loud as she could bawl, and in half a minute the men were either dragging the women out through the parlour door or smashing the parlour windows to drop them out into the front garden. As for those oil lamps, never again shall one darken my doors. The curtain was on fire almost immediately, and poor Edwin would have been roasted to a cinder if he had not let down the drawing-room window and climbed out on to the tank behind. The Flinders' girls and Angelica, who were dressing upstairs, came tearing down in such a state as I never hope to see again, and my fool of a husband kept asking why somebody didn't fetch some buckets of water instead of rushing about and screaming. In three or four minutes the drawing-room was all ablaze, and the pictures—the real ones I mean—including a water-colour of dear ma—charred to pieces.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*February* 1, 1895

THE LANTERN RECORD.

CONTENTS.

	Page
LANTERN NOTES AND NEWS	9
THE NEW COLLODION EMULSION FOR TRANSPARENCIES. By W. B. BOLTON	9
THE SEARCH LIGHT. By RADIANT	11
LANTERN MEMS. By G. R. BAKER	12
THE ELECTRIC LIGHT IN THE OPTICAL LANTERN. By C. HIGGS	13
PHOTO-MICROGRAPHY. By T. E. FRESHWATER, F.R.M.S.	14
SHAW'S STEREOSCOPIC TRIPOD HEAD	15
HOW TO USE A LANTERN	15
THE MECHANICAL PART OF LANTERN-SLIDE MAKING. By C. R. PANCOAST	15
MR. F. E. IVES ON THE ANAGLYPH	16
EXCHANGE COLUMN	16
LANTERN QUERIES AND ANSWERS	16

LANTERN NOTES AND NEWS.

Mr. J. T. Sandell, inventor of the photographic plate bearing his name, recently received the honour of an invitation from his Grace the Archbishop of Canterbury to give a lantern display of his works on the plates before a distinguished company at Addington. The series of photographs consisted of about a hundred architectural subjects and Alpine views, which were much admired, his Grace drawing particular attention to the interiors S. Marco, Gesuiti, and Scalzi, at Venice; Il Duomo, at Milan; S. Paolo fiori le Mura, S. Pietro in Vaticano; S. Giovanni Laterano, at Rome; and several of the English subjects. The Alpine views were also especially commented upon.

* * * * *

The manager of the Pavilion Theatre, Whitechapel, recently added a novelty to his pantomime, when he had the crowded house which assembled to witness the performance of *Babes in the Wood* photographed from the stage. The photograph, which was prefaced by a speech from the manager, was taken between the scenes, with the result that the whole of the audience were in their places, and received the addition to the programme with hearty applause.

* * * * *

At the monthly meeting of the Lantern Section of the Manchester Photographic Society, held on Wednesday, January 23, the President, Mr. H. M. Whitefield, gave a display of the treasures and beauties of Chatsworth House and gardens, the Derbyshire residence of the Duke of Devonshire. Having received special permission, Mr. Whitefield made excellent use of his opportunity and photographic knowledge, and produced a splendid collection of over one hundred lantern slides, illustrating the objects of interest to be seen in this Palace of the Peak; such as statuary, paintings, wood carvings, tapestries, the interiors of elegantly furnished apartments—many of which are not seen by the ordinary visitor—also the conservatory and gardens, and the model village of Edensor adjacent. The exhibition was prefaced by an outline history of the Cavendish family, from the time of its origin down to the present day, and most of the slides were made additionally interesting by appropriate remarks.

* * * * *

A very useful and well-compiled work on artificial light in photography (*Les Lumières Artificielles en Photographie*) has just been issued by Messrs. Gauthier-Villars et Fils, the well-known photographic publishers of 55, Quai des Grands Augustins, Paris. It is by the late Commandant H. Fourtier, a voluminous contributor to photographic literature, who, we are sorry to say, died a few weeks ago. He was probably the one, among French authors, who devoted most attention to lantern projection work. The book before us is freely illustrated, and treats of the photographic uses and values of all known illuminants, including gas, oil, magnesium, aluminium, zinc, the electric light, &c. The second part of the book is wholly devoted to a theoretical and practical study of magnesium and aluminium, in connexion with which the author has gathered together some especially valuable information. The work deserves to be translated into English, in which language it would assuredly have a good sale in this country.

* * * * *

We learn that the catalogue of Messrs. Thomas Cook & Sons, the well-known tourist agents, contains a list of 300,000 slides, depicting the principal beauty spots and points of interest in the world. A large number, surely.

* * * * *

Light formed the subject of a capital lantern lecture delivered at the Photographic Club, on Wednesday, January 23, by Mr. Birt Acres. Many beautiful experiments with the complementaries were shown, but, perhaps, to the audience, which was entirely photographic, nothing was more interesting or instructive than the effect of passing the light through different coloured glasses on to a coloured picture placed on the blackboard. This was quite a useful object-lesson in orthochromatics. In the course of the lecture, which we believe is to be published, Mr. Acres stated that he had discovered a new medium for dark-room work, which passed only absolutely safe light.

* * * * *

Among their novelties for stereoscopic work, Messrs. W. Butcher & Son, of Blackheath, include tinted cover glasses for transparencies. These, when judiciously employed so as to harmonise with the subject, should be equally as effective as when used for lantern slides.

THE NEW COLLODION EMULSION FOR TRANSPARENCIES.

To the maker of lantern slides the new method of making collodion emulsion, recently introduced by Mr. Edwin Banks, offers greater advantages than perhaps to any other photographic worker, owing to the exquisite cleanness and absolute freedom from fog exhibited by the preparation. Besides this, it renders the process of manufacture much easier by removing all the difficulties and uncertainties that exist in the ordinary methods in the hands of inexperienced or only occasional workers, and reduces the whole affair to one of the extremest simplicity.

It may be still further claimed for the process that it, in a very great measure, relieves the photographer from the necessity of so carefully selecting his collodion or pyroxyline, a matter of far greater importance and difficulty at the present time than was the case a few

years back, for, as is well known, a special kind of pyroxyline is required for emulsion work, and that which gives the best results for a negative emulsion is often quite unsuitable for transparencies. With the new method it is perfectly easy to utilise the ordinary commercial samples prepared for the modern market, many of which, though perfect from a physical and structural point of view for lantern slides, are wholly unsuited photographically for the purpose when worked in the ordinary manner.

For instance, I have a sample of cotton obtained from a reliable source which dissolves perfectly, and without the slightest sediment, and gives a film that, when dried, exhibits not the least trace of "structure," even under a powerful magnifier, and which is, in fact, absolutely invisible on glass. It behaves equally well in emulsification, giving a rich, clear, transparent film, thoroughly answering the old description of a "stain," rather than an ordinary deposit of silver. But, unfortunately, when used in the ordinary manner, no method of development or intensification will give anything but the faintest of images, beautifully clean and delicate, but absolutely devoid of vigour and tone; in fact, a thin, cold, metallic impression of no possible utility. But, under the new method of treatment, the combined action of the excess of silver and the acid condition set up on the addition of the bichromate of potash, the pyroxyline is so altered in character that, without to any appreciable degree losing its excellent physical qualities, it gives a rich and vigorous image, and is converted into one of the most perfect specimens I have ever used.

On the other hand, some of the best samples of "high temperature" pyroxyline, as well as papyroxyline, admirably suited for ordinary emulsion work, become seriously deteriorated in their behaviour if they are not rendered entirely useless when submitted to the new style of treatment, the necessary "organic" reaction having, in their case, been carried to its fullest extent in the process of manufacture, with the result that the further action of the bichromate apparently carries it beyond the useful point. This cannot, however, be said to be a very serious matter at the present time, when such examples of cotton are seldom met with.

It is scarcely needful to repeat the process of manufacture so recently described by Mr. Banks, as a reference to his article will supply every necessary detail; my present intention is to speak of the method of using the emulsion to the best advantage as regards convenience and economy of time, as, from my acquaintance with a good many amateurs, I am aware there is a strong prejudice against the use of an unwashed emulsion, or, indeed, anything that savours of the "preparation" of plates. Some, indeed, object to the very moderate amount of labour involved in cleaning the glass and coating with a washed emulsion—and, perhaps, such excessively energetic individuals had better adhere to commercial gelatine plates.

Of course it will depend a good deal upon circumstances how far and in what way the difference in working may affect the operator. If he has to make a single slide in a hurry, then naturally the washed emulsion is the more convenient—or, better still, a "bought" plate; but, where a number are to be made at once, the additional trouble arising from the use of the unwashed emulsion becomes really infinitesimal, and considering the superior quality of result, for lantern slides especially, is not to be taken into account. I have frequently, when I have had a dozen or so of slides to make at one "sitting," used an unwashed emulsion in preference, exposing the plates wet, the washing of one (or more) films proceeding simultaneously with the exposure and development of others, and in the long run no time being lost.

With an hour or two's work in front of him the operator will of course commence by cleaning and polishing his plates, and then I should recommend that they be at once coated with emulsion and placed on a large dish or other receptacle of water to soak. It is well to have two or three saucers of *hot* water into which the plates when coated and set are placed face downwards, resting on their corners, where in a minute or two the whole of the solvents and most of the soluble matter will be removed from the collodion film, and each plate in succession may then be transferred to the large dish of cold water to soak until its turn comes for exposure. Immediately before exposure the film should have a final rinse from a jug or tap to remove the very last traces of soluble matter, and any particles of dust or foreign matter that may have settled on it.

A dozen lantern plates may be comfortably coated and transferred to the soaking vessel in a quarter of an hour, after which the additional time occupied in washing counts for nothing, as the operator's attention is taken up with other matters—exposing and developing. One plate is exposed, and, while that is being developed, a second may be placed in the camera, if it is necessary to economise time to the utmost; but, in any case, the accessory soaking of the plate makes no call upon the operator's time and but little on his attention. If, however, for contact printing or other reasons, he prefer to use dry plates, as soon as the dozen glasses are coated he may commence with the first, and, rinsing it as before directed, rear it up on edge, resting on two or three thicknesses of blotting-paper in a cupboard or roomy box, and when the twelve are done the whole are closed up and left for two or three hours to dry. In this manner a dozen dry plates may be easily prepared in half an hour, exclusive of the time occupied in drying.

Even for contact printing it is not absolutely necessary to dry the plates before exposure, as by inserting an ordinary lantern mask between the plate and the negative, and exposing at some distance from the light, the want of absolute contact between the two surfaces will have little, if any, appreciable effect on the definition of the transparency. If this system be adopted, it will be desirable to thoroughly drain the plate before placing it behind the negative, for which purpose it should be rinsed and placed on blotting-paper to drain during the time another plate is being exposed and developed, instead of just before exposure.

To those who prefer a washed emulsion, the new method of preparation offers the advantage of securing a perfectly clean result with certainty, though it possesses the disadvantage of requiring a prolonged and careful washing in order to entirely remove the bichromate from the mass of emulsion. In the ordinary way of washing, this is a work of much difficulty, if indeed it can, under any circumstances, be effected with certainty; but by the following modified plan, although a little more troublesome, the total removal of all soluble matter is easily assured.

Let the emulsion to be washed be poured into a small basin, or a breakfast cup, if that be large enough, and let this be placed in a larger vessel of warm water, not too hot at first, though the temperature may be raised later on. Then proceed to stir up the emulsion with a strip of glass or a bone spatula, using a motion similar to that of beating an egg. As the emulsion solidifies on the sides of the basin, scrape it down into the liquid portion with the spatula, and keep stirring until it gradually thickens. As the volatile ether evaporates, the emulsion gradually gets thicker, until a point is reached when it almost settles into a pasty mass; but keep up the stirring, breaking down the lumps as they form, when by degrees a thin liquor commences to separate from the semi-solid mass, which in turn commences to become less cohesive. This is a sign that the ether is nearly evaporated, and the thin liquor that separates is the alcohol and water originally contained in the emulsion. Still continue the stirring until the mass of emulsion once more breaks up into innumerable little fibrous particles, which mix freely and loosely with the remaining liquid, and, when the separation is complete, the mass may be worked together with the spatula, and squeezed almost dry, the liquor poured away and replaced by water.

The separation effected in this manner is entirely different from that produced by precipitation, in which case the emulsion is converted into small impervious particles, in which much of the soluble matter is locked up, and from which no amount of washing will dislodge it. By the new method, on the contrary, the individual particles retain their original porosity, and what soluble matter is not drawn away with the remaining liquor is easily removed by subsequent soaking, leaving the emulsion, after a good squeeze, in the most perfect condition for rapid drying and resolution.

It is needless to say the operation just described should not be carried out in proximity to a light, or the results may be alarming. It may be conducted in an open room if not too brightly lighted, until at any rate the greater portion of the ether has gone, after which it is safe to retire to the dark room.

W. B. Bolton.

THE SEARCH LIGHT.

THE Affiliation of Photographic Societies has done nothing half so useful during its otherwise dull and unexciting career than arrange for the two series of lectures that were delivered last year and the year before. Mr. Dennison's demonstration of photogravure in the spring of 1893 undoubtedly developed an amount of interest in intaglio etching which has led to great practical benefit to many, while last year's able and exhaustive account of all that has been attempted and done in colour photography, for which we were indebted to Mr. E. J. Wall, was the means of diffusing a much-needed knowledge of the subject, and placing before the student or the experimentalist a clear outline of the direction in which further work was needed. For these lectures many a young photographer is, I am sure, grateful to the Affiliation Committee; and there is every reason to believe that the series is likely to be continued year by year. The committee have already arranged with Mr. Thomas Bolas to shortly deliver two lectures on *The Physics and Chemistry of Development*, a capital subject in competent hands, and one of which, although it is very largely written and talked about, our knowledge might very easily be increased. I understand Mr. Bolas will intersperse his lectures with numerous experiments, and, I suppose, will find occasion, in the later phases of his subject, to tell us a little more about hydroxyl-monohydride than the learned Dr. Burton Coxe vouchsafed to make public a year or so ago.

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WHICH reminds me that Mr. Bolas, in the paper over which he presides, describes "Radiant" as the personification of the editorial staff of this JOURNAL. How a single writer can personify a plurality of individuals at one operation I leave Mr. Bolas to explain. The use of the first person singular in journalism is generally understood to convey the intimation that the writer's remarks are to be accepted as an expression of individual and not of editorial or collective opinion. Therefore to say that "Radiant" personifies anybody but himself is erroneous. He, in retaliation, might assume that the editorial staff of *Photographic Work* was personified by Dr. Burton Coxe, or Dr. Fleisman, of Vienna (or elsewhere), and might be just about as accurate in that assumption as Mr. Bolas is in his.

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MR. C. G. HARPER, in an illustrated article in the *Studio* last autumn, described Shrewsbury and its neighbourhood as beautiful and attractive, and showed by his drawings that it offers a splendid field for camera work. I make this reference in justice to the selection of Shrewsbury for the next (July) meeting of the Convention, and because objection has here and there been taken to the district, on the ground of its not being sufficiently picturesque. I hope that Mr. Drage, the Shropshire Camera Club, and the popular President-elect —Mr. Haddon—will be well supported in their efforts to make the meeting a pleasant and successful one. The excursion list, as published last week, looks attractive, but, as regards the decision of the Council to constitute the Convention a body for the bestowal of medals for progress and the grant of funds for investigation, I fear a mistake has been made. This kind of thing might, in my humble opinion, be left to the Royal Photographic Society.

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IN reference to the Convention, I notice Mr. George Mason is mentioned as judging at the recent Castle Wemyss Photographic Exhibition. Every one will rejoice at this evidence of the genial ex-President of the Convention being in good health. Last autumn, I understand, he was long confined to his room with a bad foot, which also had the effect of keeping him away from the Dublin Convention. To the Shrewsbury meeting, therefore, he will be expected to go provided with a double dose of good stories.

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THIS is a "Royal" paragraph. Mr. J. W. Zaehnsdorf, of Shaftesbury-avenue, who is probably the highest-class and most artistic bookbinder that we have, recently received a visit from the Prince of Wales, who inspected the many remarkable specimens of fine bookbinding which Mr. Zaehnsdorf alone can show him. I have seen some of the permanent treasures of the establishment, and very rare and beautiful they are. But Mr. Zaehnsdorf boasts an honour which even Royalty cannot confer upon him, for he is a member of the Photographic Club, and the originator of the pretty little children's entertainments which the Club has given for the last three years.

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I UNDERSTAND that Mr. A. E. Staley, so well known for many years in connexion with the house of Charles, Reynolds & Co., Fore-street, has gone into business on his own account at 35, Aldermanbury. Mr. Staley is both a good fellow and a good man of business, and I am sure he will have the best wishes of his many photographic friends in his venture.

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THE decease of the Central Photographic Club, if it has been a misfortune as great as some of its self-styled "supporters" have attempted to make out, has brought with it at least one compensating advantage, not to itself, but to the Royal Photographic Society. Among the hundred or more new members recently elected into the latter Society are many who enjoyed membership of the late Central Photographic Club. Some of these gentlemen are regular attendants at the meetings held in the sky-kissed attic in Great Russell-street, so that we may fold our hands complacently and murmur, "Out of evil cometh good." But for the formation and dispersal of the Central Club, the Royal Photographic Society would probably have an appreciably smaller list of members than is the case.

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THE other evening, when witnessing the gorgeous pantomime at Drury-lane Theatre, I could not help reflecting that, notwithstanding the advances and improvements in spectacular productions that have taken place since I last witnessed an entertainment of this kind (alas! it was fifteen years ago, in the days of the late F. B. Chatterton), the limelight is still as largely utilised as ever for many effects. In the classic neighbourhood of York-street oxygen cylinders by the barrow-load are occasionally to be encountered at this time of the year on their way to the Lyceum and Drury-lane Theatres.

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BY the way, the principal girl at "the Lane"—that is, the lady who impersonates "Alice" in the pantomime of *Dick Whittington* at the national Theatre—is the original of the frontispiece to this year's ALMANAC. When I was in Newcastle early last year I found, from evidence supplied to me in the studio of Mr. James Bacon and elsewhere, that the Tyneside city had gone mad over the heroine of one of the pantomimes then just held. This young lady was Miss Marie Montrose. Her success was so great that Sir Augustus Harris engaged her for London, and she is now charming thousands at Drury Lane, as well as delighting countless readers of the ALMANAC from her position of honour as its frontispiece. I don't wonder at Newcastle having temporarily taken leave of its senses, for Miss Montrose is a very engaging and refined actress.

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"DEAR, dear!" I expect my readers will be saying, "you *are* pointing your 'Search Light' towards some curiously non-photographic corners this month, Mr. Radiant." Ah, my friends, all photography and no play would, I think, qualify Jack to hold the championship of dulness. So bear with me in this brief deviation from purely photographic topics; and, if any of you felt as I felt when I wended my way to Drury Lane Theatre—that is, bowed down with gout, asthma, rheumatism, indigestion, impecuniosity, the liver complaint, dimness of sight, loss of memory, and incapacity for —every thing but suicide, go and do as I did, and you will be cured by the friend of our childhood's days, good Dr. Pantomime. Your eye and your ear will be delighted; you will laugh at funny Mr. Campbell and droll Mr. Leno, as the Cook and Idle Jack; your heart will go out to a capital Dick Whittington and a marvellously clever cat, and you will come away rejuvenated, and blessing the great Sir Augustus Harris, who——[MEM. BY THE PRINTER: As the remainder of this paragraph is simply a theatrical "puff," I must

decline to "set" it. A more barefaced attempt to get an "order" for admission to a theatre I have never met with.]

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ANYTHING that tends to promote or popularise stereoscopic photography will always have a good word from me. Mr. Frank Miall, from whom have emanated some of the most useful and successful hand cameras that we have, showed me the other day a stereoscopic hand camera he has devised, and which may be expected to appear in the market during the forthcoming spring. This instrument is a simple and workmanlike one, of which the shutter, focal adjustment, automatic changing, and the various minor details are such as to qualify the camera to do all that a stereoscopic hand camera need do. There is room for a cheap and effective stereoscopic hand camera, and, unless I am mistaken, that of Mr. Miall will supply the want.

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THE incorporation of the Royal Photographic Society was not effected without the expenditure of a great deal of time and trouble by the gentleman who kindly took the matter in hand. So far, I have not seen any public recognition of his useful and successful services, and I may therefore be permitted to say that it is to Mr. F. Ince, an old member of the Society, and formerly one of its Council, that the best thanks of all interested in the Society are due, for his labours and efforts in conducting the formalities incidental to the incorporation.

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AT the forthcoming election of the Council of the Royal Photographic Society an attempt is to be made to substitute for several of the members who, during the last year, performed their duties in a careful and constant manner, a number of gentlemen whose claims and fitness for the positions in which it is sought to thrust them are certainly open to doubt. The general feeling is that, as the outgoing members of the Council have proved themselves good attenders and painstaking workers, their re-election, at this transition period of the Society's history, is the only common-sense course to take. Unfortunately a small section (including at least one gentleman whose official position should impose upon him an impartial attitude throughout the election) thinks otherwise, with the result that an active canvas on behalf of the new men has for some weeks been in progress.

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A PRINTED list of the names of the "new blood" has been shown to me, from which it is easy to realise that, now the Society has become a "Royal" one, social position is in future to be made the key to a seat on the Council. I can conceive of no policy more likely to bring the Society to a standstill, to warp its sphere of usefulness, or stunt its growth. The Council of such a Society should, I humbly submit, be a representative one—that is, composed of men who move in and understand the world and the objects they desire to serve, and not of persons whose very positions preclude them from taking any but a languid and disjointed interest in photographic matters.

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I SHOULD not write in this strain could I, or any one else, discover that all the gentlemen on whose behalf the wirepullers have been working fairly deserved the positions they aspire to obtain, I will ask my readers to say whether they do or not. Three of the candidates are members of Parliament, of which at least two have not attended a meeting of the Society for years; another gentleman was formerly on the Council, and, as regards attendances thereon, earned a duck's egg; of another it might almost be said, as it was said of Mrs. Harris, "There's no sich person;" others, again, though doubtless very wise and estimable gentlemen, have preferred for long years to cultivate a dignified and peaceful photographic *dolce far niente*. And it is of this promising kind of material that, in such enlightened times as these, it is sought to make a council for a real live go-ahead Society!

IN the bad old days of the Society—anterior to three years ago—it was some such combination of officialism, South Kensingtonism, and social positionism as it is now attempted to revive which bound down the Society to a lethargic career of inept unrepresentativeness, and it is in order to guard against a revival of such stagnancy and sleepiness that members should vote solid for the old Council.

RADIANT.

LANTERN MEMS.

JANUARY has been almost prolific in bringing to light new elements, modified apparatus, and improved methods that have been of use to demonstrators during the current month, and will be of great value hereafter. Taking them in order of occurrence or publication, we have, first, Professor Boys' demonstrations at his lecture to the young on *Waves and Ripples*, and the scientific apparatus for projecting vibrations, otherwise invisible, were of such a kind as commended themselves to lanternists. Details of these will, no doubt, be given in the form of an article, so I will not further refer to them beyond saying that, for the facilities of conducting the experiments, no less than four electric lamps and optical systems were employed at the Society of Arts.

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PROFESSOR SYLVANUS THOMPSON'S Cantor lectures on *The Arc Light* were well attended and interesting to a degree, for not only were the physics of the arc gone into and the inception and development of the light described, but arc lights were produced from currents of various electro-motive forces up to 2000 volts, the current used being both direct and alternating. In one experiment a direct or continuous current of 100 volts from the ordinary house supply was "transformed up" by means of a "motor generator" into a continuous current of 1000 volts, and an arc shown between carbon points at this pressure. In another case, an alternating current from the Deptford Supply Company's mains at 100 volts pressure was passed through a "Hedgehog" Transformer, and converted into an alternating current of 2000 volts. An arc was exhibited between carbon points at this pressure to illustrate the kind of flaming arc produced by Sir Humphrey Davy, in 1807, at the Royal Institution, the source of current in his case being a battery of 2000 cells.

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WHEN one thinks that it was as far back as June, 1800, Volta announced his discovery of the Voltaic pile, and that, soon after, Davy whilst experimenting with a pile made of 150 pairs of plates, found that he could obtain sparks from the contact of electrodes formed of well-burned charcoal, it seems strange that only during the past twenty years has the arc light become one that could be generally utilised for commercial lighting purposes. This, as most people are aware, is explained by the fact that battery power was troublesome to arrange and maintain, and it was not until dynamo machines were invented and perfected that electricity could be generated in sufficient quantities to become a possible rival to gas and other means of artificial illumination.

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As regards the material used for producing the arc light, there are no less than sixty-six known elements, and yet only one, namely, carbon, is so used, and this, from the first, was considered the most suitable; in fact, in 1820, gas retort charcoal was found to be so good for the purpose that it is the kind used ever since. The electric arc light can be made to burn in oil or water, but it is fitful and noisy, and, if zinc is used for striking the arc, the light roars. A curious fact with regard to different sizes of carbon is, that when the arc is produced they are all of practically equal temperature.

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WITH the alternating current the carbons are positive and negative in turn, changing as the alterations take place in the current. The arc light thus produced makes a humming sound, and

so for optical work is not so satisfactory as continuous (or direct) currents. At the same time, experimenters need not be deterred from using a small arc lamp for optical lantern purposes on this account, for a light two or three times as intense as the best lime-light can be obtained and kept fairly steady if a little more attention is given to the light to keep the arc shorter than would be necessary with the continuous current. In the instances I have in my mind, where some experiments were being conducted in an average-size room, the "hum" would become monotonous for a long optical lantern entertainment; but for microscopical projections or scientific experiments, of ten minutes or so at a time, very few will find fault with it, while in a large lecture hall, like that of the Society of Arts, it could be used constantly for a two hours' lecture without hesitation, as only a few of the audience just near the lantern would be in a position to be irritated by the sound.

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The electric arc produced by the alternating current can be seen to travel round and round, if the points of the carbons while burning are projected on the screen, and it is more apparent as the length of the arc is increased; hence the reason for keeping the arc short when employed for optical lantern work. With the arc produced by continuous current, with a crater in the positive carbon and point formed in the negative, it has been thought, until recently, that little or no movement took place in the crater, and Professor Sylvanus Thompson's announcement of Mr. Trotter's researches throws quite a new light on the working of the arc by direct or continuous currents.

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He has found, and the fact has been demonstrated by experiment, that a luminous crescent in the form of a comma is constantly rotating in the crater, but in a most curious way; sometimes 400 times isecond, other times 100 times a second, while now and then it is a only five times a second. A disc, with slits moving at the rate of 400 to the second, will reveal this phenomenon, something on the plan of the thaumascope. This movement in the crater and constant variation of intensity of any given spot prevents the arc light, in the opinion of Professor S. Thompson, ever being a standard light. He also found that the cored carbon loses a small amount of light, but secures steadiness.

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Another remarkable statement at these interesting lectures was the fact, of the rays produced by the arc light only one ray was efficient as light-producing to twenty-five non-efficient; in other words, four or five per cent. only were light rays, the rest being heat rays.

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The third lecture on the arc lamp will not be given until this is in the printers' hands, so the reference to different forms of arc lamps will have to stand over until next month. That electric lighting is gaining favour as the illuminant for optical lanterns is shown every week by its being adopted by societies, in private houses, on board ship, and in theatres—in fact, wherever current is available.

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One does not often hear of an opaque lantern being used now, but our old friend the Aphengescope figured prominently at a lecture by Mr. H. A. Miers, of the British Museum, on *Gems* at the Imperial Institute in the early part of the month, when the natural colours of the various precious stones were projected on the screen. This is supposed to be the first time they have been exhibited in public in such a manner, and, when one considers the result was satisfactory with the limelight, it opens up possibilities for many uses of an opaque lantern now the electric lamp, with three times the power of the limelight, is so generally available, and thus neutralise the loss of light consequent on the reflected rays escaping at the same angle as the incident rays, and so not being available for projection.

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The announcement by Professor Vivian B. Lewes of the possible commercial production of the wonderful gas known as acetylene has already been referred to in a leading article in The British Journal of Photography, so I will only touch now on its probable development as an illuminant for the optical lantern. If, as one reads, it may be possible to get a light of twenty candles' power from a pound cartridge or stick of calcic carbide, placed in a strong steel cylinder four inches in diameter and sixteen inches long, which in water generates its own gas, that can be burned at the rate of half a cubic foot per hour for ten hours, it may be possible, with a modified apparatus, that can be used in any village or place where no gas or electricity is available, to get a light sufficient for optical purposes, and that in a convenient form.

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To read of the wonderful illumination, simplicity, and, above all purity of the gas makes it look like the ideal light of the future, the carbon dioxide produced being less than one-sixth that of a No. 4 flat-flame burner and less than four adults would exhale, as against an amount exhaled by over twenty-two adults, as represented by the equivalent carbon dioxide produced by No. 4 flat-flame. It is so wonderfully cool, considering its power, that the heating effect would not be much greater than the ordinary electric incandescent lamp. With the appetite whetted by these facts and figures by Professor Lewes, it is to be hoped that a company or some private individual will have the necessary courage to place acetylene on the market, or supply calcic carbide and suitable apparatus for generating and delivering the gas for use either in the optical lantern or for enriching present gas for general illumination.

G. R. Baker.

THE ELECTRIC LIGHT IN THE OPTICAL LANTERN.

It is perhaps somewhat premature, in view of the present "infancy of electric lighting" (for which well-worn phrase the writer begs the indulgence of readers of this Journal), to make any accurate comparison between the electric light and the limelight in their utility and general efficiency as applied to optical projection, but it is possible, by considering the principal points of advantage and disadvantage of the two systems, to arrive at a very clear idea of the lines such application will follow in the near future.

The advantages of the different forms of limelight over the other methods of illumination are so well known that it is not necessary to go over them in detail; and, further, the incandescent electric lamp is not so suitable for projection as the arc light, the latter being a perfect spot of light.

On the score of portability, when the lantern is used for touring purposes, the carting about of the gas cylinders for the limelight becomes a very serious item of expense and trouble (to say nothing of the difficulty in obtaining fresh supplies of gas which is sometimes experienced), these cylinders being both in weight and bulk considerably more than the cables and resistance frames for the electric light. There has, of course, to be taken into account the fact that, at present, only the larger halls are electrically fitted; but, presuming this difficulty to be overcome, as will probably be the case within the next few years, the advantage on this ground would appear to be with the electric light. It is to be regretted that there does not exist any portable method of storing electricity in sufficiently large quantities, as with the compressed gases. As has already been pointed out in this Journal, the electric light compares very favourably with the limelight in the initial expense and cost of working.

While the light given by the best form of mixed gas jet does not exceed some 250 candle power, the smallest arc that can be successfully maintained would have an intensity of about 150 to 200 candle power, and from this there is a range to some 3000 candle power, which is considerably more than would be required for the lantern

In the writer's experience the most useful intensity to ensure a steady light lays between 500 to 1000 candle-power, it being somewhat difficult to keep a good arc with a smaller amount of current, but at this intensity the attention required by a hand-feed lamp is certainly no more than that required by the gases.

The electric light cannot well be used for dissolving unless one of the old form of dissolving arrangements, as used for oil lamps, or the flashing shutters, be used (and this necessitates wasting current for the lamp not in use), any attempt to rapidly switch the current from one lamp to another only resulting in a "jumping" arc, but with the increasing popularity of single lanterns this need hardly be taken into consideration. Even using a double lantern, an operator, with some practice, could easily arrange for a minimum of waste.

Briefly, therefore, the most useful application for the electric light would be in halls or institutions where the lantern is practically always in use (as for educational purposes) and where the building is already wired, or for use by a lecturer at other halls so fitted, for projection to large dimensions and other purposes requiring an intense light, and for commercial enlarging; while, for places where the electric current is not available, and, in fact, for the general run of lantern entertainments, the limelight will hold its own for a considerable time to come. C. Higgs.

PHOTO-MICROGRAPHY.

[London and Provincial Photographic Association.]

In bringing the subject of photo-micrography before you this evening I feel that I am rather awkwardly placed, as I know you will expect something new; but so much has been said, and more written, lately on this subject, and there are several members much more up to the work than I am, I know that it would have been more ably dealt with by some one else.

Treating the subject quite from a popular point of view, leaving the scientific and high-power work to such men as Pringle, Bousfield, Crookshank, and others, spending a little more time on the subjects that are less known, I hope I shall be able to keep your attention for a time, but I promise you it shall not be long.

First, let us consider the apparatus. There are many ways of taking photographs of minute objects. One of the simplest is to use an ordinary microscope, with the instrument turned down, bringing the body parallel with the table; then, at the eyepiece end, fit up your camera. A half-plate, with a long body, will give you plenty of extension for low-power work. Now, for the luminant, a good, large, single-wick paraffin lamp will answer for all ordinary purposes. The bull's-eye condenser, on a stand, should be placed in such a position as to fill the object to be photographed with light evenly all over. This part of the operation must be done very carefully; too much trouble cannot be taken with this part of the work, as so much depends upon the even and proper illumination of the object in the resulting negative. With such apparatus most of the ordinary objects may be photographed, such as parts of insects, sections of wood, and most of the coarser diatoms. The whole should be fitted up on a long, heavy, flat board, and very carefully centered, and made as true and steady as possible.

I think I can explain the various forms of photo-micrographic apparatus better with the slides that I have prepared than I can here in these rough notes. I have slides of Van Heurck's vertical apparatus; this consists of an oblong box, mounted on four legs of such a length that the ocular end of the microscope passes through the bottom of the box, and the box is large enough for the head to pass in for focussing purposes. The other one is Mr. Pringle's vertical camera, which has many advantages over the solid box, as it is made with a conical bellows body, and the screen is made to slide down. The large apparatus was constructed for the Royal Veterinary College, and is a magnificent piece of mechanical work. The microscope is fitted with all the most recent improvements; the whole stands on a concrete floor, so that all vibration is done away with. There are several points to be taken into consideration—first, the apparatus, then the lenses; these are most important, and, like photographic lenses, expensive items to deal with if one goes in for high-power work, but I am not going to touch on this line, so will leave it to Mr. Pringle and others, as it is quite out of the reach of the many, and only necessary for high scientific research. The Germans have hitherto made most of the best lenses for photographic work—lenses that have given better definition, flatter field, light and more even illumination, which come about by the use of the new glass from Jena, and the introduction of fluor spar into the composition of the objective, but now the English opticians are beginning to wake up in this direction, and many lenses are made that are quite as good and no more expensive; in fact, I have some that it would be difficult to beat as regards defining power and the amount of light that they pass; for photo-micrographic work it is an immense advantage to have more light than you want, as it can always be stopped down by the use of the iris diaphragm, or, as some prefer, set stops. These, perhaps, in many cases, have an advantage. I think it is well never to use a higher power than you can help; it's better to extend your camera, and put in an ocular, or compensating eyepiece. These are made on purpose, and work with a spiral motion to the eye lens, so as to focus the diaphragm stop in the tube. The apparatus on the table I have designed, and is made by Messrs. Newton; it is simple in construction and inexpensive. The camera is of long extension, and has a bellows some thirty inches long, the whole mounted on a mahogany board. The front part is made to rack back, so as to clear the eyepiece of the microscope, to enable the operator to revolve the instrument on its centre. The microscope is one of a new series of patterns they have brought out, and for all ordinary work will answer every purpose. It has a simple mechanical substage, fitted with an iris diaphragm and Abbe condenser, with adjustments for centering; the mirror is made to swing out of the way when not in use. A very convenient way of seeing how to arrange the object is to place a flat mirror at some distance from the ground glass at the end of the camera, the image on the screen is reflected on to it; you can, by this means, see that the object is in the centre of the field, and easily focus the object, centre the light—in fact you can, without any difficulty, get the whole thing ready in a very short time, except the final focussing, which has to be done very carefully. Having now roughly focussed the object, remove the ground-glass screen, insert a plate of plate glass, with lines ruled on it, and it will be found useful to have these lines ruled at a given distance apart—say one-tenth of an inch—and a Ramsden eyepiece used for focussing. I shall not here say anything about the vertical apparatus, but leave it until I show the slides.

Coloured screens or light-filters are very useful. It is well to be provided with several different ones, such as signal green, bluish grey, yellow, and cells filled with coloured fluids, for in many cases working in monochromatic or other coloured light, according to the object. I had intended to show you a number of photographs taken with various screens, but have not had time to prepare them. One of the advantages of their use is that, if the object is very delicate and likely to be flooded with light, the use of a screen comes in, and objects that it would be almost impossible to expose quick enough, by the insertion of a screen enables you to make a good exposure and get all detail, notably in the delicate membrane of some of the wings of flies, &c. With regard to illumination, as I have said, an oil lamp will do very well; but, if you can get the limelight, it is much more satisfactory; the light is more pure in colour, more intense, and more easily under control. A blow-through jet will answer all purposes, and if it is fitted with a Pringle cut-off—that is an arrangement for lowering the gases between the exposure—you save the gas and also make sure of getting the same amount of light each time.

The time of exposure one can give no fixed rule, so much depending on the subject, its colour, thickness, the amount of density, and power used.

I should like to make a few remarks on photographing some objects that are very beautiful, such as those that are opaque. A very little, as far as I can see, has been said about them. I allude more particularly to the eggs of the various parasites, the coarser foraminiferous scales on the various wings *in situ*. Now, these are more difficult to do, and some of the best work in this way I have seen has been done by my friend, Mr. Fred. Evans, and I think, in fact I know, they are not to be equalled. I candidly confess I cannot do them nearly so well; a few of my attempts I will show you. As all the light we have to deal with is that which is reflected from the object itself so that it is absolutely necessary to concentrate all the light possible on the object, there are several ways of doing this, but, first of all your object must be mounted very flat and in the centre of a small black disc so as to allow the light to pass round the object from your condenser. This light then falls upon a circular silvered reflector or Leiberkhun mounted on the objective, the curve of which must be equal to or a little longer than the focus of the objective, so that, when the object is in focus, a small amount of collar adjustment enables you to focus down and adjust the rays of light that have been received upon the silvered surface of your reflector. Of course, the more light you can get on your object the better will your resulting negative. Such objects as small shells, polystina eggs of butterflies, light-coloured seeds, in fact, anything that will reflect and not absorb the light may be photographed in this way; a parabolic silver side reflector is sometimes used, but this is not nearly

o good, you are apt to get strong shadows on one side. I am sorry shall not be able to show you many examples of my work in this irection, but the few I have I hope will show you the beauty of heir structure, and how easy it is to make pictures of such minute hings. I have a lovely specimen of the eggs of the parasite of the Reeves pheasant *in situ* clustered on the feather of the bird.

There are many objects that, to see the construction of, it is ecessary to use polarised light. Sections of rock, such as granite, gate, labradorite, &c., nearly all the crystals, are quite clear under rdinary light, but when the light it polarised they are very beautiful, nd when on the dark field show up all the varied form and composition that would, under other circumstances, not be seen.

The polariser, that is, the prism nearest the light, should be as large as possible, so as to pass as much light as you can through the object. The analyser follows on at the back of the objective, and should be mounted as close to the lens as possible, otherwise it will cut off some of the field, and, to get the best result, both the polariser and analyser should be made to rotate. A secondary condenser may be placed in front of the Nicol with advantage.

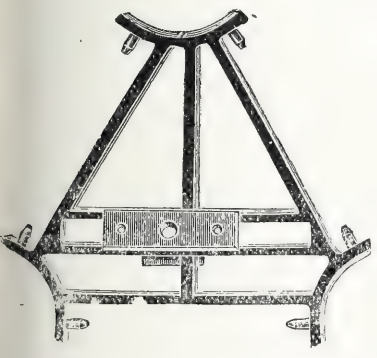
Work done by dark ground illumination has a great charm, more particularly to the student who has a love for pond life, and to see the minute organisms scudding about lit up like small particles of silver on a black ground. The common Hydra, vorticella and many others may be photographed by one who gives it his careful study. Diatoms, sponge spicules, polyzoa, and many other objects look grand done in this way. These few that I will show I hope will bear me out in this, notably the slides of synapta and cluster of diatoms.

The matter of printing I have very little to say about, but the paper best to use is one of the many gelatino-chlorides squeegeed down on a glass plate. Many subjects I might have dealt with in more detail, but have not had the time, and hope at some future occasion to show you more of my work on this class of subject.

T. E. Freshwater, F.R.M.S.

SHAW'S STEREOSCOPIC TRIPOD HEAD.

Charles Shaw, 104 Aston-road, Birmingham.



This is a modification of the ordinary tripod head, which enables the possessor of a single quarter-plate camera to take two dissimilar pictures with the one camera, and thus procure a view steroscopically. In use the loose plate, as shown in the diagram, is attached by two screws to the tailboard of the camera, the tailboard screw passes through the central hole, and is secured into the tailboard boss as usual. To take the stereoscopic picture, move he sliding plate to each end of the slot in the head, which is the equired distance between the two lenses as used in a binocular camera. Where it is not required to take moving objects, this tripod head will be ound very handy, especially for architecture, interiors, and still life enerally.

HOW TO USE A LANTERN.

At a meeting of the Southsea Amateur Photographic Society, on the vening of January 16, Major Wilkinson explained to the members present the construction of the optical lantern and the different steps to be aken in preparing it for an entertainment. He prefaced his remarks by aying that the instructions he had prepared, and which are given below, pplied only to his own lantern, and that, in using others of different atterns, some modifications would be necessary. It is probable, however, that his instructions will apply, without any change, to a large umber now in use, and that, in cases where a different procedure is ecessary, slight alterations in some of them would be sufficient to suit hem to any particular lantern. It is in the hope that the following otes will form the basis of a code that will prove useful to many that he details prepared by Major Wilkinson are given below. An experinced lanternist has since revised the instructions and suggested several mendments which have been adopted.

Major Wilkinson's lantern is a single one fitted with the limelight. He uses gas compressed in the ordinary cylinders, and never dispenses with the regulators.

Directions for Use.

Cylinders.

1. As soon as unpacked, tighten valve glands by spanners, otherwise they are liable to leak when gas is turned on.

2. Fix regulators and tubing. Red regulators and red tubing; red regulator and red tubing to hydrogen cylinder (painted red), with a left-handed screw, and black regulator and drab tubing to oxygen cylinder (painted black). Never interchange tubing. What has once been used for hydrogen (coal gas) should not be used for oxygen, and *vice versâ*.

Lantern.

3. Fix lantern on top of box, with spare screw inside lid, and fix rose or other top on dome. (If an oil lantern is in use, extend chimney before fixing to lamp.)

4. Open ventilators to lantern.

5. Fix required jet, mix or blow through. The mixed jet should not be used, unless both gases are under pressure from cylinders.

6. Connect hydrogen (coal gas) cylinder (painted red) with H tap, and oxygen cylinder (painted black) with O tap, by means of the tubing.

7. Bypass of jet should be open, *i.e.*, with the word "On" at the top of the head of the revolving rod which extends outside the lantern.

8. The H and O taps should be turned off, *i.e.*, at right angles to the pipes they control.

9. Turn on gases at cylinders by means of key. Turning the key about 90° is generally enough.

10. Take a lime cylinder from tin. Clear out hole in centre, dust it, and fix it on to its support in the lamp.

11. Slowly turn on H tap, applying a match to jet, and light the gas; let it burn with a small flame, reaching to about the top of the lime for at least five minutes, keeping the lantern closed for the sake of greater warmth. The lime can be rotated as required, and at the same time it is gradually lowered or raised.

12. Adjust distance of lime from jet. The surface should be about three-sixteenths of an inch from jet, a final adjustment being made when O is turned on.

13. The H flame being small—say, one inch long—slowly turn on the O tap till the flame begins to change and shorten; then a little more H; then a little more O, and so on.

14. Make final adjustment of lime. With the blow-through jet the lime should be as close to the nozzle as possible, without a black spot in the centre being visible. With the mixed jet it should be as close to the nipple as the turning of lime cylinder will permit.

15. Adjust incandescent point of light into focus of condenser. The conjugate focus should fall about the centre of the objective (diaphragm slot). You will therefore want to insert a slide, and focus it on the screen. Having got your objective approximately right, perfect the centering of your light—raising or lowering, slewing to right or left, advancing or retiring—so as to get an evenly illuminated disc on the screen. Refocus slide, and make any final adjustments required.

16. Final regulation of gases to get the best possible light.

17. When all is satisfactory, turn off byepass, so that word "Off" is at the top of the head of the revolving rod. Do not touch taps again, unless they get shifted by mistake.

18. The lime should be slightly turned after changing each slide, an intermediate turn being given after every two or three minutes, if the description is long. This is to avoid pitting. A deep pit or crack is liable to make the jet hiss, and the flame is sometimes thrown back on to the condenser, and cracks it.

19. If the hydrogen has been kept long in its cylinder, it is liable to clog the jet a little. If so, turn light down by the bypass, and touch the jet with the point of a knife. Nothing should be inserted into jet that can possibly make it rough inside.

20. To extinguish the lamp, turn off O and H taps little by little, commencing with the O tap. Another plan is to turn off the bypass, turn off oxygen and hydrogen at the cylinders, revolve incandescent part of lime to back of lantern, and blow out the small flame.

THE MECHANICAL PART OF LANTERN-SLIDE MAKING.

[Photographic Society of Philadelphia.]

It may seem superfluous on my part to call your attention to so trivial a subject as the matting and mounting of lantern slides, and my excuse must be that, while for many any explanations would be out of place, yet there are some to whom a word of advice will not be unwelcome. I wish to call your attention particularly to the purely mechanical part of the work. In this I include the various adjustments of the camera, negative and plate-holders, the making of the mats, and binding. It is an absolute rule that the centre of the picture on the slide *must* coincide with the centre of the glass, no matter what may be the shape of the mat opening. The reason for this is, that to secure the best definition in the lantern, the centre of the slide must be in the optical axis of the instrument, all lanterns being made and adjusted so that the centre of the slide-carrier is coincident with the axis. Some imagine that, if the opening in

the mat is anywhere on the slide, it will suffice, trusting to the lantern operator, by an almost impossible adjustment, to rectify the error. Thus it is that we often see a picture projected on one corner of the screen, or possibly with a portion cut off, and all more or less out of form—a disgrace to any exhibition. All this may be overcome by care and attention. In providing a copying camera, or other equally convenient apparatus with which to make slides, the operator should look to the various adjustments needed. First of all, the focussing screen and the plate-holder must register absolutely, otherwise sharp slides are an impossibility. Focussing should be done with a magnifier, and the slide must be just as sharp as a lens will make it. Second, there should be two movements to the carrier holding the negative—oue a vertical and the other a horizontal; where such are not provided, the same results may be obtained by mounting the lens on a double-sliding front board for convenience in manipulation; this latter plan is preferable. Without these adjustments it is impossible to properly centre a slide. Now find the exact centre of the sensitive plate as it is carried in the plate-holder, and transfer that point to the ground-glass focussing screen. From this centre lay out accurately the various shapes of mat openings, drawing the lines carefully on the ground glass with a lead pencil. It will thus be seen that, if the work is carefully done, an image focussed on the ground glass within the lines marked will occupy the exact centre of the sensitive plate. With these lines it is very easy to adjust the image by means of the vertical and horizontal movements of the negative carrier, so that the negative, or any part of it, may be brought to the required mat opening, and be absolutely centered on the plate. I have dwelt at length on this subject, for it is the keynote of accurate slide-making, and, while adding to the beauty of the picture, renders its projection in the lantern a matter of certainty. Now as to mats. The usual form of mat made of black enamelled paper with gilt lines has been sanctioned by usage for so long a time that to break away may seem radical; but progressive ideas are always in order. To my mind, the ideal mat is made of a heavy paper, white on one side and black on the other. On the white side (which is always placed next the condenser in the lantern) is written or printed the title and any other data which may be desired; also the maker's name, and in the lower left-hand corner a "thumb mark" to denote the proper position to place in the lantern carrier. Over this mat is placed the cover glass, thus protecting the writing and avoiding the necessity of an outside label. To the lantern operator the readiness with which the white side may be distinguished, and the ease with which the titles may be read, when necessary, in the dim light of a darkened room, are great sources of satisfaction. From the lanternists' standpoint all pictures should be uniform in size and shape, so that they will "dissolve into" each other perfectly. To do this, the regulation mat has an opening very nearly square, with rounded corners. This is all very well, but from an artistic standpoint square pictures are objectionable, as not giving sufficient scope to good composition, and, as all plates used are more or less oblong, it seems somewhat incongruous to make an oblong picture in the camera, and cut a square out of it for the lantern. In my opinion, therefore, it is far more desirable that the artistic side be given the preference over time-honoured custom, and that we adopt mat openings which best harmonise with the subject of the picture, whether square, oblong, or round. With this end in view I have, in addition to the usual square form, which is oftentimes very desirable, three other forms—one for horizontal, one for upright, and one for circular pictures, the openings in the former being an exact reduction of the proportions of a $6\frac{1}{2} \times 8\frac{1}{2}$ plate. To cut these openings, I use a set of steel guides, made exactly $3\frac{1}{4} \times 4$ on the outside, the inside openings being as first described. By placing one of these guides on the mat on a piece of glass, and using a "Robinson trimmer," the opening can be cut out with great ease and accuracy.

A few words about cover glasses. The desire for a very transparent thin glass has caused many to use a French or German make, which, at first sight, seems admirably adapted to the purpose; but unfortunately there is something in its manufacture whereby the alkali exudes and condenses on the surface in peculiar arborescent markings. This incrustation on the under side of the cover is frequently so great as to almost obscure the picture. This may be overcome by varnishing the cover; but, better yet, use a hard English crown glass like Chance's "B.P.C." I have found ordinary negative glass answer perfectly, care being taken to select thin lights, free from bubbles and scratches. Where old negatives are used for this purpose, the side on which the film has been should be marked, and put on the outside. Over a year ago I mounted two plates—in the manner of a slide—one of German glass and one of English crown. Both were chemically cleaned before being put together, and in the time elapsed the incrustation on the German glass is very marked, while the other is perfectly clean. C. R. Pancoast.

MR. F. E. IVES ON THE ANAGLYPH.

The anaglyph is an interesting curiosity, but the optical principles involved are the same as in the old and rejected method of stereoscopic screen projections with coloured glasses, of which it is merely an adaptation. The method has no practical value whatever, because the printing in two colours is more expensive than printing the two halves of the stereogram in black, side by side on the same paper which gives much better results, not requiring an unusually strong light to see them, and the short focus or prismatic spectacle lenses used not tiring the nerves of vision like the use of two different coloured glasses. I have seen a book that was illustrated with stereograms (the two images printed side by side, in the usual manner, in black) furnished with a detachable eyeglass with prismatic lenses. It seems to me that such illustrations would be very suitable, and add much to the interest of many books on science and travel and some catalogues. Unlike the anaglyph, one image of the ordinary stereogram furnishes a good representation without the use of the glasses.

Du Hauron appears to suggest that the anaglyph, if the two halves of the stereoscopic negative be made by exposure through different and suitably coloured glasses, should approximately reproduce the colours of the object photographed when seen through the coloured glasses. If this were true, the anaglyph would possess one important advantage over the ordinary black stereogram; but it does not require much knowledge of colour science to show that the plan is irrational. Not to mention various other difficulties, it is evident that only two of the three fundamental colour sensations could be represented in the prints, and even these would not be at all adequately reproduced to vision, because colours cannot be well blended through the two eyes. An optical mixture of the light transmitted by deep ruby and chromium-green glasses makes a beautiful yellow; but, if we look at a white object with a ruby glass over one eye and the green over the other, it will look red at one instant, green at another, bronze at another, ever changing, but never for a single moment such a good yellow as is produced by mixing the coloured lights before they reach the eye. Nachet, of Paris, has make the same mistake in attempting to realise a true reproduction of the natural colours in a stereo-chromoscope, in which one eye receives one colour impression and the other a different one.

Exchange Column.

Wanted, a good mahogany magic lantern, for a very good musical box; plays eight tunes, with bells and drum; worth 5*l.* 5*s.*—Address, C. Seawy, 164, Camberwell New-road, London, S.E.

Lantern Queries and Answers.

Injector Jet.—We have no further information than that given in the report of the Manchester Photographic Society.

Border.—Screens with ornamental borders are no novelty. You could, doubtless, obtain them by ordering of a dealer in lantern requisites.

C. Tuill.—Yes, in making slides of the pictures referred to you would most decidedly be running "risks," of a possibly unpleasant character. See the article in the Journal of January 25 on the subject.

Inankorane.—1. If you ran the saturator dry, in all probability an explosion would occur. 2. Mr. Beard treats of this question in his paper on *Limelight Manipulation*, Lantern Record, November, page 84, to which we refer you.

C. H. Gould, of Chicago, writes: The express companies in this country now refuse to forward cylinders of gases, although the high-pressure cylinders, so common, I believe, with you, are not used here to any extent. Will you kindly either publish the requirements of the British railway companies for forwarding cylinders; or, if these regulations have already been given, refer me to volume and page? I cannot find them, though I have an idea they have been printed.—In reply, the following certificate has to be filled up and signed by the sender of the cylinder: "This is to certify that the cylinder used for this consignment complies with the condition that it must be wrought iron or steel, of sufficient strength, and efficiently tested."

*** "Projected Portraits" and other matter unavoidably held over.

On Thursday evening, February 14, at the London and Provincial Photographic Association, Mr. R. P. Drage will give a lantern lecture, *The Far East*.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*March* 1, 1895

THE LANTERN RECORD.

CONTENTS.

	Page
LANTERN NOTES AND NEWS	17
VIGNETTING BY ARTIFICIAL LIGHT. By W. B. BOLTON	18
THE SEARCH LIGHT. By RADIANT (F.R.P.S.)	19
LANTERN MEMS. By G. R. BAKER	20
CHADWICK'S NO. 2B PATENT LANTERN	22
NEWTON'S NEW PHOTO-MICROGRAPHIC APPARATUS	23
PHILIP'S INCANDESCENT GAS BURNER FOR THE OPTICAL LANTERN	23
CORRESPONDENCE	23
LANTERN SLIDES BY ARC LIGHT. By W. M. STINE	23
LANTERN QUERIES AND ANSWERS	24

LANTERN NOTES AND NEWS.

Dr. Shufeldt thus describes his improvised apparatus for making photo-micrographs: "I took my largest camera and placed it on a long table. I removed its lens and lens board, and fitted a cardboard front to take its place. Next I took my largest microscope—a Beck's Monocular National—and brought it into the horizontal position. I fitted the upper end of its body, while in this position, into the cardboard front of the camera. A substage condenser and a $\frac{3}{4}$ in. objective were next attached to the microscope, and the camera and the latter coupled together. Now most photo-micrographers omit using the eyepiece of the microscope; but with it I subsequently obtained the best results. It is inserted *after* the barrel or body of the microscope is run through the cardboard into the front part of the camera box. For an illuminator I used the dark lantern of my photographic outfit, simply withdrawing the ruby-glass slide in front, and fitting in its place a thick piece of cardboard, into the centre of which I inserted the lens from a small camera to act as a 'bull's-eye condenser.' This is coupled with the substage condenser on the microscope by means of a broad rubber band. My lantern I held nicely in the proper position by suspending it between the 'rings' of a chemical standard, but any simple device will hold your lantern up in its proper place. It can even be 'built up' by putting books under it. Both the lantern and microscope rest upon a very thin board, which travels with ease on the extension bed of the camera box. By this latter simple contrivance focussing your specimen on the ground glass of the camera is easily managed."

* * * * *

In the combustion from the Argand burner we are told that there exists no carbon monoxide, but with the Welsbach burner is found formene and carbon monoxide to the extent of 1 in 2580 parts. Direct chemical tests were employed, and also physiological tests. According to these results, then, it is highly desirable to provide some means for conveying the products of combustion direct to the outer air, where the Welsbach burners are used.

* * * * *

A transparent mirror glass, introduced by Herr Alfred Rost, of Halbstadt, reflects light on one side, from which it is practically opaque, while from the other side it is transparent. It is proposed to use this type of glass for glazing windows in the streets of a town; for, while it will not cut off light or vision from the interior, it will prevent outsiders from seeing into a room.

It is stated that, by Willson's method of preparing calcium carbide in the electrical furnace, it is estimated that a short ton of the material can be produced in North Carolina at a cost of 15 dollars. From this, by simply mixing it with water, may be obtained 10,500 cubic feet of acetylene which, when a suitable proportion of air is added, is equal for illumination to 100,000 cubic feet of ordinary city gas. The calcium carbide is readily transported, and seems to solve the problem of cheap gas for out-of-the-way places.

* * * * *

The Birmingham Oxygen Company write to their customers: "We regret to inform you that our endeavours to avert the new railway regulations have proved futile, and that from the 1st of March all cylinders sent by rail, whether by goods or passenger train, must be packed in cases of approved form. Of the cases allowed, our experience has shown the only kind which will wear well are those made of hemp. These cases, unlike all other forms, will not add materially to the weight of the cylinders, and the slight extra cost will therefore be quickly saved in carriage. They are also the most convenient, as the cylinders may be used without removing the case."

* * * * *

Is the electric light superseding the limelight on the stage? Referring to a new arc lamp for theatrical and like purposes, our contemporary, *Invention*, says: "For many years limelight has been extensively employed in theatres and other places of amusement, and, though troublesome to handle, it has been found valuable for illuminating the stage and its actors. Like everything else, however, this mode of lighting has undergone a process of evolution, and limelight in theatres is being rapidly superseded by its powerful and formidable successor, the electric light. The arc lamp is at once admitted to be far and away ahead of the limelight, so far as their respective illuminating powers are concerned; but a brilliant light is not the only thing the stage manager requires—he must have variations in the colours, and he must have the lights so arranged that they can be focussed on to a decided space, moved about in various directions or extinguished at a moment's notice. At first, the electric lamps that were tried for stage lighting were made automatic, but these would not do at all, for they were awkward in focus and a trouble to extinguish and start up again, and, worst of all, being automatic in feed, there was an opportunity for their attendants to slip away, and this led to awkward blunders in the lighting during performances. As a result of these trials, one or two hand-feed lamps have been introduced, one of which strikes us as being particularly well adapted to its work. It is a hand-feed focussing arc lamp, which takes five ampères; the reflector is not silvered, as the silver does not stand the heat of the arc, but it is coated inside with whiting, which is found to give the best results. The base is arranged with a sliding contact, so that the lamp may be taken out and replaced without disconnecting any wires. The frame is constructed with horizontal and vertical swivelling motions, so as to allow the light to be thrown in any required direction, and slides for holding coloured

glasses are provided. We understand that this lamp has been adopted at some of the leading theatres in London and the provinces, and that at one theatre, where eight lamps are in use, a saving of 15*l.* per week is effected over limelight. The same lamp is adapted for electric launch projectors, lecture table use, and advertising purposes. The manufacturers are The Crypto Works Company, Limited, 29, Clerkenwell-road, London, E.C."

* * * * *

In connexion with the trial of Captain Dreyfus, the Paris correspondent of the *Daily News* writes: "What Dreyfus said about the judgment of the experts on handwriting proves right. Four such experts were summoned. Two of them declared that the document was not written by Dreyfus, one that he could not form any decided opinion, and only the fourth that the document was written by the prisoner. The opinion of Dr. Bertillon, who is known as the inventor of the anthropometrical system, decided the matter. Dr. Bertillon claims to have discovered a new process for identifying handwriting. It is based on the measurement of the beatings of the pulse, which are said to have in everybody a different and thoroughly characteristic effect on the handwriting. The inventor is said to enlarge the specimens by photography till the letters are a foot high and then the characteristic marks are seen."

* * * * *

Messrs. Archer & Sons, of Lord-street, Liverpool, inform us that they have lately extended their premises, having obtained possession of Nos. 45 and 47, so that they now occupy Nos. 43, 45, 47 and 49, right up to the roof. They have lately carried out some experiments in the improvements of lantern screens. These were hitherto not thoroughly opaque, so that light went through. Various backings were tried, and one selected which makes the screen quite opaque and yet allows it to lie perfectly flat. The Lantern Committee of the Manchester Photographic Society speak highly of it.

VIGNETTING BY ARTIFICIAL LIGHT.

Very few amateurs have sufficient practice in vignetting, or give adequate attention to its details when they do attempt it, to turn out really good work, even when working by daylight; but, when it comes to artifical light, as in printing opals or transparencies, and to some extent in enlarging, the difficulties are so augmented, that nothing but failure is the result in the majority of cases.

The ordinary amateur places his trust almost entirely in the vignette glass, or other devices of commerce, many of which are capable of executing good work if properly and intelligently used, but wholly useless if simply placed in front of the negative and left to perform their task automatically, and without attention. Consequently, vignetting is an operation that is neglected, if not intentionally shunned, by all but the professional photographer.

But, thanks to the introduction of bromide opal plates, as well as the various papers for development, a good deal of work that was formerly done by daylight is now performed, if not at night, at least, preferably, by artificial light, and a constantly increasing proportion of it is in the form of portraiture. Landscapes, groups, and even simple portraits upon bromide or other papers, which are cut out and mounted in the ordinary way, do very well printed "full out" or "solid;" but, when the support is opal, and, to a less degree, perhaps, when transparencies are in question, portraits, at any rate, are scarcely done justice to when printed right out to the margin of the plate. Opals, as a rule, are not framed, but mounted on blocks, or in some other manner, which renders a margin desirable, if not essential, and the same may be said of transparencies which certainly do not show to the best advantage when filling the whole of the frame, no matter what may be the character of the subject.

Masking or vignetting thus becomes almost a necessity, and, though in a large number of instances the former gives very satisfactory results, there can be no doubt that for portraiture the effect is considerably improved by vignetting, and, except for architectural subjects, the appearance of the picture is seldom deteriorated. But the first attempts at vignetting by artificial light are nearly certain to have the effect of thoroughly discouraging even those who are fairly conversant with the routine by daylight, not merely by reason of the entirely different conditions of lighting, but also on account of the very different scale of gradation given by development. These two effects combined, in fact, entirely alter the whole face of matters, and, even with vignetting glasses or masks that give practically perfect results in ordinary daylight printing, it will often be found quite impossible to secure a satisfactory result by gas or lamp light.

To give an instance, I have by me as I write two opal pictures from the same negative—a vignette bust—one printed by the carbon process (of course, by daylight), the other upon a bromide film by lamp light. In the former, the gradation of the softening away of the picture is as near being perfectly satisfactory as I can hope to attain; in the other it stops abruptly almost as soon as it commences, although the same vignette glass was employed in both cases, and placed in contact with the negative.

As I have made innumerable pictures on opal as well as paper under apparently identical conditions, I set the result down to some fault of the vignetter, although this, which was made upon carbon tissue by the method I described a few months back, was to all appearance perfect in its shading, and gave quite satisfactory results by daylight. With the view of getting increased softness, the vignette glass was fixed about half an inch in front of the negative, and a second exposure made, when, strange as it may appear, the result was even worse, the clear aperture seemed to act as a mask, and the direct rays of the lamp cast a shadow of the commencement of the gradation, which simply gave a blurred edging little, if any, better than a sample of bad masking.

This was the more surprising because the vignette glass is so delicately shaded that it is scarcely possible, when it is laid upon white paper, to say exactly where the shading commences, and in its densest part is, to the eye, quite translucent, and in strong daylight will easily print through. The cause of the difference from my ordinary results was to be found, however, in the employment of a new lamp utterly unsuited for the purpose. This is a duplex, giving a powerful light, and the exposure had been made to the direct rays at a distance of about four feet, whereas I ordinarily use a much weaker light, either protected by a ground-glass globe or else encased in a wooden-bodied lantern, the interior of which is light in colour and acts as a reflector, diffusing the light over a larger area. The employment instead of the new and powerful light was practically equivalent to substituting sunlight for diffused daylight, which, as all know well, would be fatal to ordinary vignetting.

The mask, too, differs from what I usually employ for artificial light, although, as I have already said, it is a perfectly graduated one, and rather tends in the direction of thinness, for ordinary work. What I generally employ for developed vignettes is a compound of two very thin graduated screens, having apertures of different size, placed at a distance of about three-eighths of an inch apart, so as to vignette one into the other. Either screen alone would be useless for ordinary vignetting owing to its thinness; indeed, the two combined are not strong enough to prevent the image printing through the densest portion when using chloride paper. A much tinner and more delicately graded vignette is required for sensitive bromide films and development than for ordinary printing out.

With a properly diffused light, say a single-wick paraffin lamp placed a foot behind a sheet of ground glass, perfect vignetting is secured by the use of a carbon screen such as I have described if not too dense. The result is better still if the light be enclosed in a box or lantern, the whole of the front of which is covered with ground glass or tissue paper or *papier minéral*. In that case, the sides of the lantern reflect the light on to the ground-glass front which becomes a radiant of considerable area. Failing such an arrangement, an equally good result is obtained by allowing the light from the lamp —in this case it matters not what sort—to fall upon a sheet of white paper and exposing the printing frame to the reflected light from that surface.

I used formerly to employ the revolving table when working by artificial light, but I have long given that up owing to the difficulty

of evenly illuminating the centre of the picture when the light was placed at such an angle with the frame as to secure soft gradation. In order to secure this end the rays must fall so obliquely upon the screen or mask that the edges of this aperture cut off nearly as much light from the centre as from the edges of the plate, besides which, unless the frame revolve in a perfectly horizontal direction, that is, if it should swing about ever so little during the exposure, the gradation is very uneven. Hence I much prefer a properly graded screen.

For the benefit of those who may wish to make these vignetting screens, I may mention a great improvement in the process that I have adopted since I last wrote, which very materially simplifies the manipulation. Instead of drying the carbon tissue in the ordinary way, and squeegeeing it on to glass after exposure, I perform the latter operation after *sensitising*, and allow the tissue to dry on the glass, which should be previously prepared with a coating of gelatine or the albumen and bichromate solution, which I previously gave for the purpose. The exposure of the tissue is then made *through* the glass, with the result that by the action of light the image is firmly cemented to the glass, and it is practically impossible to wash away in development even the most delicate portions of the gradation.

W. B. Bolton.

THE SEARCH LIGHT.

Mr. Joseph Chamberlain, M.P., made a photographic suggestion in the House of Commons the other night. Apparently some labour question was before the House, and there was not at the moment a generous attendance of so-called "labour" representatives. Mr. Chamberlain thereupon "wished the House could have been 'Kodaked' that night, for a photograph would have shown the working classes what interest in a matter so closely affecting their welfare was displayed by those who claimed to be the representatives of labour." The Member for West Birmingham is an able man, but apparently he falls short of that degree of cleverness which restrains a man from publicly talking of things which he doesn't understand. We have not yet reached that stage of photographic progress where shutter exposures on interiors artificially illuminated in the ordinary manner are likely to yield results of practical use. Mr. Chamberlain's politics are possibly sounder than is his photography.

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Nevertheless, the Liberal Unionist leader's suggestion, wild though it was, may in a sense be capable of yielding fruit in the dim and distant future. Mr. Weller, sen., attached a profound value to an *alibi*. As a means of proving an *alibi* nothing is so irrefutable as photography. For example, modern wives are cynical and doubting, and are not prone to blindly regard their husbands' absence of an evening as fully accounted for by the statements that they were late at business, or at the club, or in the House, or at an Exeter Hall meeting, or at the vestry, or at any function or ceremony which could be referred to for the purposes of explaining a non-attendance at the domestic hearth. All marital doubts on the point, however, would be at once dispelled by the production of an attested photograph showing the self-sacrificing spouse to have actually been on duty in the debating chamber, or elsewhere, and it is therefore quite within the bounds of feasibility that one of the features of the New Century will be that a photographic installation, with a powerful artificial light, will form part of the official appurtenances of such places as the House of Commons, Exeter Hall, the local vestry-room, and similar resorts, and that a photograph will be regularly taken of those present there at a particular time. If the same system is extended to the Empire Music Hall, the Alhambra, and the public-houses, I suppose Mrs. Chant and the other queer apostles of the New Morality will be delighted. For it is a prying, spying age, my masters!

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My excellent contemporary and neighbour, "Grimalkin," of the *Stage*, in his latest number, quotes a few of the inverted axioms drafted by Mr. Oscar Wilde into his new play at the St. James's Theatre. Here they are:—

Divorces are made in heaven.
The truth is rarely pure and never simple.
Women only call each other sister when they have called each other lots of other things first.
It is a much cleverer thing to talk nonsense than to listen to it.
Cleverness becomes a public nuisance.
To be advanced in years is no guarantee of respectability.
To have lost one parent is a misfortune, to have lost both looks like carelessness.
Only such people as stockbrokers talk "business," and then only at dinner.
The old-fashioned respect for the young is rapidly dying out.
Nobody ever does talk anything but nonsense.
It is always painful to part from people one has only known a brief time.
If it were my business, I should not talk about it.
I am only serious about my amusements.
No married man is ever attractive to his wife.
The amount of women who flirt with their husbands in London is simply scandalous. It is washing one's clean linen in public.

What a tinselled sham it all is!

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Now that the ex-æsthete, Mr. Oscar Wilde, has started this eccentric but shallow craze of varying and topsy-turvying familiar aphorisms, we are possibly doomed to be afflicted with quite an epidemic of *bons-mots* and proverbial philosophy run mad. The thing apparently is very easy. You have simply to take a familiar saying and turn it the wrong way round, taking care that the occasion of it harmonises with an equally absurd situation or opportunity, and the result is a flash of wit—but only a flash. The old simile of the rocket applies here perfectly. Up it shoots, there is a gleam and a blaze; the next moment down it comes, and the rest is dismal darkness. So with Mr. Oscar Wilde's new-style witticisms.

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"But why, oh, why, dear Radiant," say you, "do you impose these things upon us, who know nothing of Wilde or his Wildenesses?" I will tell you, my friends. I want to anticipate the photographic bore! Profiting by the example set by Mr. Wilde, you may expect him shortly to blossom into A new Wit, and deliver himself to his photographic friends in some such manner as I shall try to indicate in the next paragraph.

* * * * *

Thus:—

To be photographed is to be libelled.
A lens is an optical instrument of no use to a photographer.
Beauty or truth in a photograph are impossible—also intolerable.
A photographer should know something of photography, if only to forget it.
The photographer who calls himself an artist betrays evidence of the most painful sanity.
Dr. P. H. Emerson has received the medal for progress—backwards.
Photography would be tolerable but for the necessity of exposure, development, ond printing.
A medal is a guarantee of ability to deceive the Judges.
A knowledge of photography is detrimental to the production of a photograph.
The Salon will possibly one day be a photographic Exhibition.
Nothing is sacred to an amateur photographer — not even the beautiful.
A hand camera is a scientific instrument.
And so on.

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The Exhibition of photographs, to be held in conjunction with a Tobacco Exhibition at the Agricultural Hall next June, is an innovation in more ways than one. Two questions at once assert themselves, namely (1), What has photography do do with tobacco? and (2) Why increase the already too lengthy list of photographic exhibitions held in London? I do not wish to throw cold water on the scheme, but I can't help saying that this particular Exhibition might very well have been dispensed with. It is to be held at midsummer, and thus we are taken one step nearer the holding of exhibitions all the year round instead of, as in the good old days, during the autumn and winter only. I shall watch the experiment

with considerable interest. The Exhibition is dated to take place within measurable distance of the Royal Photographic Society's Exhibition in September, and it may be useful to intending exhibitors at the Photobacco Show to know that, according to the Royal Society's regulations, *photographs previously exhibited in London* are ineligible for awards at Pall Mall.

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The case of Hanfstaengl *versus* Tyler reminds me that a lamentable depth of ignorance prevails among photographers in regard to the law of copyright as defined by the Act of 1862. Partly in some degree to remove that ignorance and its accompanying misapprehensions, several articles on copyright appeared in the Journal in the early part of last year and in the number for April 27 the entire Copyright Act was reprinted. It is also given in the 1895 Almanac. Like most Acts of Parliament, this is not so clear as it might be; but an intelligent perusal of it will at least put photographers and others on their guard as to the risks in reproducing other people's pictures and photographs, and that is why I refer to the matter here.

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The London and Provincial Photographic Association is constantly asserting its claim to be looked upon as an original and unconventional body. Its history during the last two years has been of an eventful character, as all my readers are aware, and one never knows from week to week what may turn up in the shape of new excitement. The latest freak of the "London and Provincial" is a sale of members' surplus apparatus. This is to be held on Thursday evening, April 25. Members will receive particulars shortly. It is anticipated that the sale, which will be conducted on the orthodox lines, will be largely availed of, the date chosen occurring about the time when most amateurs are overhauling their stock and putting their dark rooms in order.

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I don't know whether it is intended rigidly to confine the sale to photographic apparatus and sundries alone; but, if it is not, some additional piquancy and variety might be imparted to the proceedings by admitting a few miscellaneous articles. Here is an imaginary list:—

1. Six shares in the Camera Club Company (exdividend).
2. A Fellowship of the Royal Photographic Society.
3. Autograph of Dr. Burton Cox (authenticated).
4. Photograph of "Cosmos" (very scarce).
5. Mr. H. P. Robinson's collection of medals (in packets of one dozen).
6. Dr. P. H. Emerson's dictionary of synonyms.

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In that skilfully managed reflector of artistic taste, *The Studio*, for February 15, there is an article on *The Photographic Studies of Foregrounds*, by Mr. C. F. Townsend. This is finely illustrated by several reproductions of photographs submitted to my contemporary by competitors for prizes for photographic studies of foregrounds. Mr. Townsend himself also has photographs, *au naturel*, of foxgloves, grasses, brambles, wood anemones, angelica, bulrushes, and bracken, and in pointing out the beauty of effect lying in such subjects for the camera, gives some useful practical hints which, however, are occasionally marred by lapses into very queer photography. For instance, he says, "It is well not to work with anything smaller than half-plate, as the detail, which constitutes the great charm of these studies, is liable to be lost." I never knew till now that "detail" depended on the size of plate used.

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The foreground studies of the prize-winners, Mr. T. G. Hibbert, Mr. C. R. Whiting, Mr. R. J. Haynes, and Mr. A. G. Cooke, are capital in the double sense of being good examples of their kind, and what we understand as artistic studies of pretty scenery. I refer to them here, because I could not help thinking when looking at them what fine subjects for stereoscopic treatment they all are. In the examples illustrated, the arrangements of the subjects in foreground, middle distance, and distance, is such as could not have been better fitted for binocular photography. I hope Mr. Townsend and the competitors took some of their subjects stereoscopically; but am afraid they did not. Can not I persuade the editor of *The Studio* to take stereoscopic photography under his kindly wing? A little encouragement in artistic quarters would be much appreciated by stereoscopists generally, and would give a welcome fillip to one of the most beautiful and fascinating branches of photography.

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You will remember that last month I spoke in praise of the Drury Lane Pantomime. Some of the scenes are marvellous blazes of light and colour. I understand that between 3000 and 4000 8-candle-power electric lamps are simultaneously alight in the chief scene, whilst there are 1500 Edison-Swan lights of 8-candle power alight in the wreaths and festoons of gold and silver, and other appurtenances which are used in the transformation scene. There is a big Christmas tree in what is called "A Dream of Hollytide," which is lit by 450 8-candle-power lights. The electric current is drawn from the mains, the connexions for lighting the scenes being made by simply slipping pivots with a cable attached to them into slots on the stage, and from this main cable protrudes a series of spikes.

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Messrs. R. & J. Beck, of 68, Cornhill, send me a little pamphlet descriptive of the Frena hand camera for the coming season. The makers say that there are not less than 3458 Frena cameras in use! A capital result of two seasons' sale, surely! The pamphlet is a model of clearness and simplicity, and is of a nature likely to be readily grasped by the intending Frenographer who knows absolutely nothing about photography, and burns to become an accomplished photographer by the shortest cut. Messrs. Beck say, "Anybody who can ring an electric bell and turn a door key can take photographs with a Frena." There are times, and especially in the "wee sma' hours," when it takes an exceptionally clever man to turn a door key—but let that pass.

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Of course, like most of my fellow-mortals who reside in this country (which the geography books of my school days said possessed an "equable" climate), I have been severely punished by the recent frost snap. In my neighbourhood water has been about as dear as cheap claret, so that development and the washing of negatives or prints have been costly operations, only to be indulged in with a due regard to the state of the finances. Naturally, I am enjoying a visitation of the fashionable complaint—indeed, a cold I took last Christmas still affects me, and as each succeeding week since then has simply "piled on density," as it were, I glory in, perhaps, as much influenza as would stock a small village. And yet my friends are talking to me, and writing me letters, about the delights of Snow Photography! Bah! A-tishoo! A-tishoo!! A-TISHOO!!!

Radiant (F.R.P.S.).

LANTERN MEMS.

Professor Sylvanus Thompson, in his third and last lecture on *The Arc Light* at the Society of Arts, described the various forms of arc lamps, and gave particulars of the temperature of the arc. As regards the latter, the lecturer told his audience that until recently the subject was a matter of guesswork, for anything from 10,000° C. to 500,000° C. was given as the probable temperature, until in 1879 Rossetti took the matter in hand, and, basing his deduction on the radiation of the arc, found the temperature of the positive carbon was 3900° C., and the negative peak 3150° C., the arc itself being hotter, viz., 4000° C. Other experimenters in America and France found the crater in the positive carbon 3500° C., and the negative carbon 2700° C. It was further stated that, whether large or small carbons or 10 ampères of current or 1000 ampères, the intensity or "intrinsic brilliancy" for unit area of the light given out from the incandescent crater was practically the

same, and the heat for a given area also the same. However, it is thought that much has yet to be done in order to exhaust the subject.

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With regard to the feed of lamps and their adaptibility for certain purposes, it was suggested that the records of a voltmeter would indicate if the feed was good, for any irregularity would affect the voltage. Certain carbons deposit dust when burning, but by a curious property of the electric arc the flame follows the deposit, and cleans the surface of the carbon point. Carbons should be kept in a dry place, for it has been found that perfectly reliable carbons, under normal conditions, produce an irregular light when they have been kept in a damp place.

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Various arc lamp mechanisms were described suitable for general and special lighting, but those adaptable to the optical lantern were left until the last. Among the latter were the Brockie-Pell, the Planet, Borland's, Major Holden's, and Davenport's. One of the latter was used in the lantern for the photographic projections, and was spoken of in complimentary terms by the lecturer when speaking of projection arc lamps, while a "Planet" was employed in a special piece of apparatus for showing the comma-like movement in the arc, and this lamp, if I understand rightly, was converted for the time being into a hand-fed lamp, so as to get the steadiest possible light.

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This is only in accordance with what has been found on many occasions previously by science demonstrators and lanternists, viz., that a hand-fed or semi-automatic lamp is more reliable and under more perfect control than any automatic lamp, and it is only the most expensive forms of arc lamps, with perhaps one exception, that can be said to feed regularly without attention, and, if they require this spasmodically, it is better to have one that requires it regularly, and which is no more trouble than turning a lime every two or three minutes. I recently had the advantage of seeing a number of arc lamps burning that had been designed for the optical lantern, and by projecting the image of the carbon points on the screen it could be seen how those with different-sized carbons and spring feed for both carbons designed with the view of being automatic were not really so, the make up or feed, on account of the different areas of the burning carbon, being very irregular. If one of the carbons are kept up to an abutment pole, so as to secure centricity, the arc can be controlled by mechanically moving the upper carbon, and a steady light secured.

* * * *

The Lantern Society, notwithstanding the severe frost, had a strong muster of members at Brin's Oxygen Works on the evening of the 12th February, when, by the courtesy of Mr. Murray (the manager and engineer of the Company), the process of making oxygen by heating oxide of barium and passing air through it was shown and explained. The interest taken in the subject was considerable, and the different portions of the work more readily understood by the very lucid introductory explanation given by Mr. Murray in the office of the Company prior to the members setting out on the tour of inspection.

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The arrangements of the works seem admirable, and the improved machinery employed in testing and filling the cylinders leave very little to be desired. The machine that created most interest—I was almost saying astonishment—is the pump for automatically filling and exhausting the retorts. First it pumps in air, previously purified and dried, into the retorts containing the barium, and heated to a temperature of about 1400° Fahr., and continues to do this for five minutes; it then automatically reverses and draws off the oxygen, which is conveyed into a holder, and also, at the right time, liberates the nitrogen or impurities given off in the process. The barium, in fact, acts with oxygen like a sponge does with water.

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The method of testing for purity of gas, testing the steel cylinders, filling the same and annealing cylinders, when new, or periodically, according to the new rule, were all shown in operation; but, as these matters have been fully described from time to time, I will not go into details here, simply recording the opinion expressed by Mr. Murray that the life of a steel cylinder was at least twenty years if used, filled, and annealed as proposed, also that no oxidisation takes place inside steel cylinders used for oxygen, for he had the opportunity of inspecting a cylinder after seventeen years' use, and found there was no deterioration.

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The trouble lanternists have had from time to time with a dark or red deposit on the lime when using compressed coal gas was due to a deposit of iron carbonate, and, although many things have been tried to get over the difficulty, Mr. Murray said that they had not solved the problem, and thought it almost impossible to do so. It is recommended that carburetted hydrogen (house gas) should not be stored longer than necessary, but oxygen can be kept any length of time. Brin's Company do not make or purify the coal gas, but pump it into cylinders as delivered to them from the gas mains.

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By a curious coincidence, I went over another gas compression works on the following day, but this was a Government one, and the gas produced was not oxygen but pure hydrogen, and for a totally different purpose, viz., supplying the war balloons. I have often been to Aldershot, and many times seen the war balloons, both captive and free, but I had no idea that the works were on such a large scale as they are, and so much gas is produced and compressed. As I find one balloon I saw in course of construction requires 11,000 feet of pure hydrogen to fill it, one can understand better the necessity for large works, especially as officers are often going through a course of instruction by making ascents. As an interesting item in the construction of the balloon, it may be mentioned that 38,000 skins, somewhat of the kind that are used for producing goldbeaters' skins, are used in the construction of one balloon, skins being found better for holding pure hydrogen than silk.

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The number of cylinders in store was enormous, and some of gigantic dimensions, but those that pleased me were some wonderfully light steel cylinders, which had been coated with copper, to preserve them from rust. This was done by an electroplating process, and some others were silvered. I believe the pure hydrogen gas is obtained from water by electrolysis.

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Making magic-lantern slides from book illustrations, photographs, and pictures, is always a risky thing to do, and should never be undertaken without the consent *in writing* of the publisher of the book or copyright-holder of a work of art or photograph. I remember, nearly thirty years ago, that an optician copied some illustrations by Ernest Griset of the *Three Ancient Mariners*, without thinking there was any harm in it, and, in fact, the question had not been raised before; but the publisher's agent bought a set of the slides, and "law" was the result. This optician has long since retired from the field of practical lantern work and business, but I have no doubt some of the back numbers of The British Journal of Photography and the press generally will show a letter of warning to others on the subject.

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What an amateur photographer does for his own use must not be shown in public, for a profit or otherwise; in fact, as I understand it, there must be *no* publication or use, and under no circumstances can anything be copied for trade purposes, or at customer's order for payment.

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Since writing the above I have come across in The British Journal Photographic Almanac the details of the "Copyright (works of art) Act," and it is of such importance to all lanternists and producers of magic-lantern slides, that I would suggest they read and mark same. The Act seems so far-reaching in its application

that lecturers will not be able to do with impunity in future what they have been in the habit of doing in numbers of cases previously, viz., copy for any special lecture illustrations from books or photographs those things they thought necessary to make clear any particular point, or, in the case of science and other teachers, to aid them in the demonstration of facts and phenomena.

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It is to be hoped that publishers and copyright-holders will, on being written to, willingly give permission for the making of single magic-lantern slides for purely educational purposes on condition of the acknowledgment of same being made to the audience and printed or written on the slide; and, when produced commercially for distribution for the same purpose, or for entertainment of an elevating character, not impose a fee or royalty that will be prohibitory, for the optical lantern has become of such great assistance to the teacher that, if the strict letter of the law is adhered to in matters of this kind, its usefulness may be curtailed.

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In order to show that it is not only in the matter of making and selling copies of works that are copyright that penalties are incurred, but for the *exhibition* of same, I reproduce a portion of the clause on "Penalties on Infringement of Copyright" as follows:—"(6). . . . . or if any other person, not being the proprietor for the time being of copyright in any painting, drawing, or photograph, shall, without the consent of such proprietor (and this is previously stated must be in writing) repeat, copy, colourably imitate, or otherwise multiply for sale, hire, exhibition, or distribution, or cause or procure to be repeated, copied, &c., &c., any such work or the design thereof, or import or cause such work to be imported from abroad without consent as aforesaid, shall forfeit to the proprietor of the copyright for the time being a sum not exceeding ten pounds; also forfeit all such imitations, copies, or negatives, and besides this the copyright-holder may recover damages by and in a special action in the case to be brought against the person so offending," &c.

G. R. Baker.

CHADWICK'S NO. 2B PATENT LANTERN.

W. I. Chadwick, 2, St. Mary's-street, Manchester.

This new lantern of Mr. Chadwick's is conceived on principles of simplicity for combined ordinary and scientific projection purposes, and will, doubtless be found effective and satisfactory in use. It fulfils the three functions of an ordinary projection lantern (fig. 1), a vertical projection system (fig. 2),

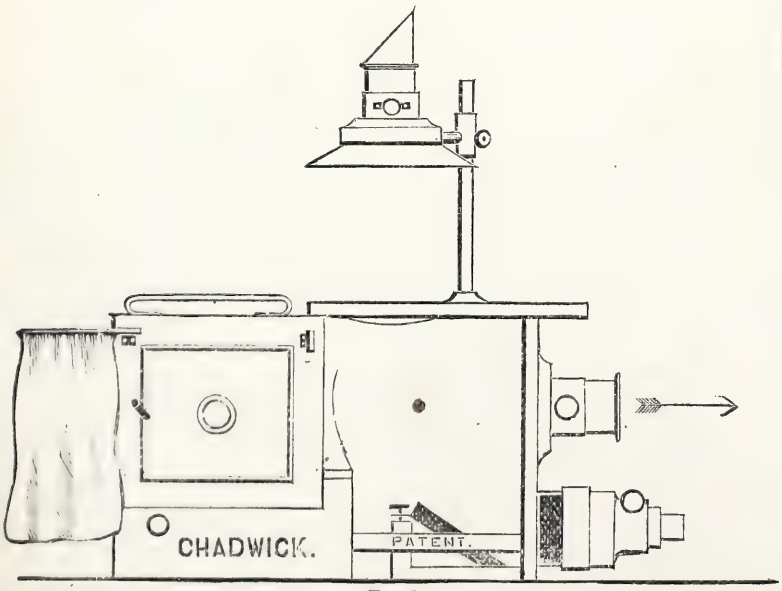


Fig. 1

and a lantern polariscope (fig. 3), the change from one to the other being instantaneously effected, the same illuminant and condensers serving for all three purposes. The cuts show the simplicity of the various changes of movement.

Briefly, some of the advantages are that the same lantern front also contains the polariscope, and it matters not what focus lens is being used

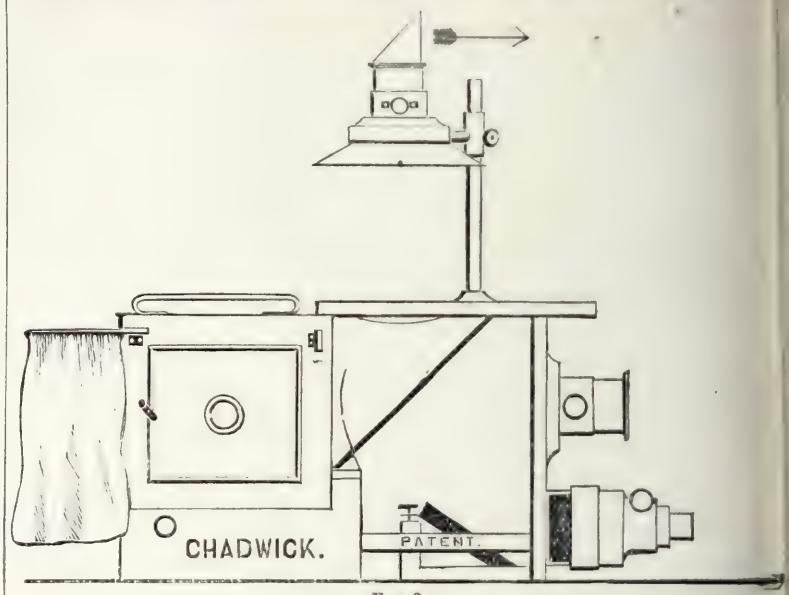


Fig. 2.

for direct projection or the position of the front, for, although the illustration shows the mirror for polariscope in No. 3 as resting against the lantern body, it really does not touch it. The novelty is, ordinary objective and polariscope on the same draw front, or the vertical attachment is

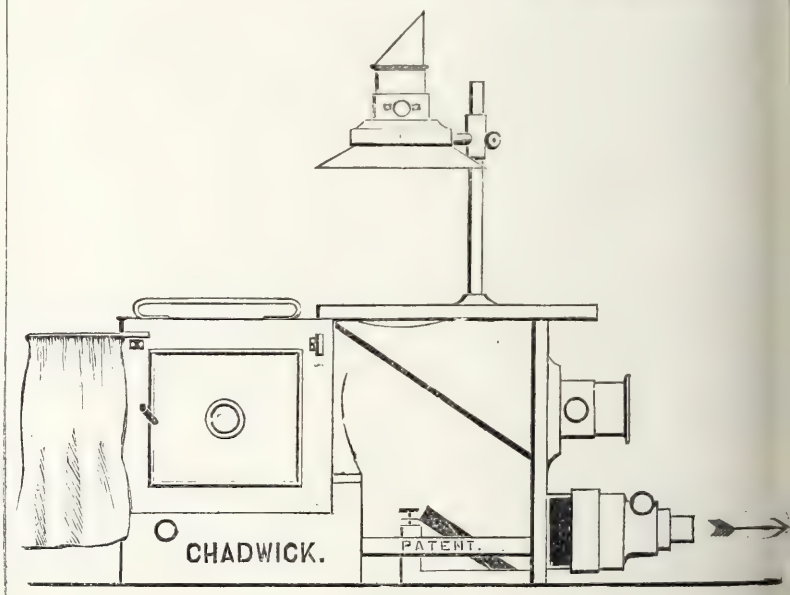


Fig. 3.

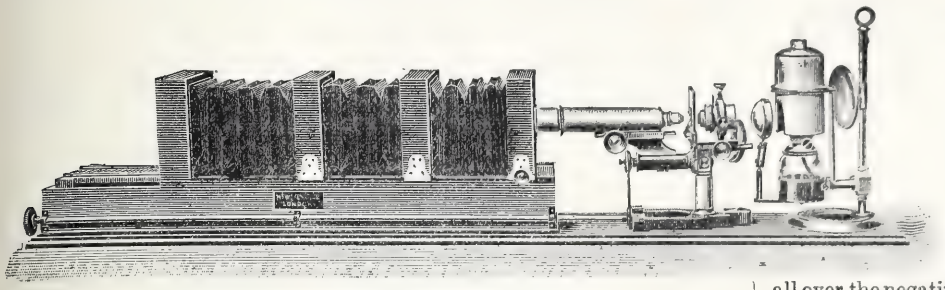
simply laid on top with suitable attachments, and it may be removed or replaced instantly. The lantern may be had without polariscope or vertical attachment, and at any future time one or both these may be had, and they will fit exactly. The polariscope stage and objective can be used in the condenser axis as an optical "front" or experimental nozzle for parallel beam, spectrum work, &c., all being interchangeable. The greatest advantages are that all the parts are adjustable, all parts and the light can be adjusted before a lecture or demonstration, so that the change is made from one to the other and no further adjustments are necessary as with all instruments where lenses, &c., are to change positions.

A Good Word for Stereoscopic Work.—Mr. Westrop, an old member of the Photographic Society of India now settled at home, sends the Editor of that Society's journal this advice: "Make the best use of your time with the stereoscopic camera; you can use the negatives for making lantern slides, enlarging, or for stereoscopic work. My stereoscopic slides always *take better than large pictures* in any company. I wish I had taken to stereoscopic work earlier."

NEWTON'S NEW PHOTO-MICROGRAPHIC APPARATUS.

Newton & Co., 3 Fleet-street.

The illustration represents the photo-micrographic system devised by

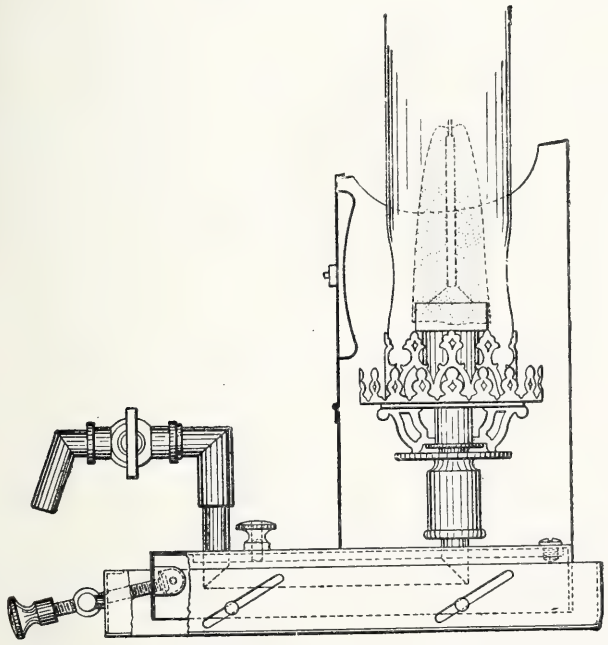


Mr. T. E. Freshwater, and described by him in his paper on *Photo-micrography* printed in last month's Lantern Record. The apparatus is simple and sufficient for the purpose.

PHILIP'S INCANDESCENT GAS BURNER FOR THE OPTICAL LANTERN.

G. Philip & Son, 32, Fleet-street, E.C.

The illustration shows the method adopted by Messrs. Philip & Son for utilising the incandescent mantle in an ordinary single lantern. House gas is admitted in the upper tube, which is bent so for convenience. The



screw at the back enables the burner to be raised or lowered, and a lateral or forward movement is given by means of slots on the upper part of the tray, a side to side motion being also obtained. A metal chimney or casing fitted with a small reflector forms part of the system. The mechanical arrangement and movements are excellently devised, and a very fair light, equal probably to that of an average oil lantern, results.

Correspondence.

ENLARGING FROM LARGE OR SMALL NEGATIVES WITH AN ORDINARY MAGIC LANTERN.

To the Editor.

Sir,—Finding it difficult to find time to make enlargements during the day, it occurred to me I should have to adopt artificial light, and having to make several enlargements, from 12×10, 10×8, and whole-plate negatives, and not possessing a large-size condenser, I solved the difficulty with first-class results in the following manner.

Having a small dark room adjoining a workroom, which has a wooden partition of matchboard intervening between the two; in this partition I cut a small window, fourteen inches square, and into that I fitted a wooden frame (reversible) to carry negatives from 12×10 down to a quarter. On the workroom side of the window I fitted a wooden frame with a groove in it to carry a sheet of ground glass, opal, or tissue paper, stretched tightly across, this is within about one inch of the negative; in the dark room I fasten a frame around the window, on to which I fasten a hood of black silesia; under this window in the dark room I place a table at a suitable height from window to carry camera and lens The back of camera I put inside of the black hood; this prevents any light from entering the dark room other than passes through the lens. At a suitable distance I place an easel to carry bromide paper, and when about to enlarge I take the ordinary magic lantern (limelight preferable), and throw a white disc of light on to the ground glass, opal, or tissue paper, which is in front of the negative. This gives a beautiful even illumination all over the negative sufficiently strong to enlarge from all ordinary negatives.

To those possessing a double extension camera with rack in front, all that is necessary is to put the negative into the dark slide of camera, and put camera back into the black hood, withdrawing shutter of slide before inserting into hood, then you can enlarge to your heart's content.

Never having seen or heard of this mode of illuminating negatives for enlarging, I thought, for the benefit of fellow-workers, the idea may be of some service. Enlarged negatives, transparencies, &c., can be made in exactly the same way.—I am, yours, &c., B. Pearce.

Empire Studio, Machynlleth, February 18, 1895.

LANTERN SLIDES BY THE ARC LIGHT.

[Anthony's Bulletin.]

It has been very interesting to note from time to time in the *Bulletin* the results of the use of the arc light in studio work. Recently this form of illumination has been receiving especial attention, and its employment seems to be on the increase. Though working on a different line, that of the employment of photography for purely scientific purposes, I have finally been led to the use of the arc light, to the exclusion of the flash-light, and even sunlight. But it is especially in the making of lantern slides that I have found the arc light to be of such great service. In lecturing on electrical subjects before classes, I have discarded all forms of illustration save the lantern slide. These have been taken from the cuts in books and periodicals, as well as from original drawings, and the collection includes, not only pictorial subjects, but letter-press data, such as tables of figures. I have always found it a comparatively easy task to make a satisfactory lantern slide from a landscape negative, or such negatives as are ordinarily employed for lantern work, in comparison with making a really good slide from a printed drawing or page. This forms a branch of photography almost distinct in itself. Here the great *desideratum* is a perfectly black-and-white negative, for the slide should be intensely black in its lines, with a background of perfectly clear glass. Usually either the background is clouded or the lines weak. Then, again, the camera is vastly more sensitive to the finish of the paper of the page, and its colour as well, than the eye. In such work speed is also a great consideration, for necessity demands that such slides be made by the hundred.

Experience soon showed that even a very strong direct light of a gallery could not be depended upon for the required density, for such work requires direct sunlight on the page to be copied. I have recently substituted for sunlight the focussed light of an arc projector. Negatives made in this way have proved in all cases as satisfactory, and in a few even more so, than those made in bright sunshine. Here, again, the eye is a poor judge of light. It is extremely difficult, when bright sunlight is on a white page, to determine if all parts of this are equally lighted, for the slightest bending of the page will produce a marked gradation of light in the finished negative; this is especially due to the angle at which the sunlight strikes it. With the lantern this can be readily controlled, so that its rays fall almost perpendicularly on the matter to be copied, and slight bends are scarcely perceptible. Another very great gain from the use of the arc light is that work can be done at any time, day or night, independent of the weather. It also ensures great speed and uniformity of results, for, with a good lamp, the light is sensibly constant, and, if the books be placed at a fixed distance from it, exposures of the same length show equal density, allowing, of course, for the area of the subject photographed.

The projector which we have employed with perfect success has been the Colt lantern, with the automatic lamp taking about 10 ampères at 110 volts. The book is placed about 6 feet from the lantern in focus for 15 feet. With a Zeiss lens for a Carbutt plate, 16 sens., the usual exposure is six seconds. The negatives are made to the size of the finished slide. The positives are usually made by direct contact printing with a small incandescent lamp.

I have yet to see more uniform and better results than have so far been obtained by this method. Our experience extends over about five hundred slides, embracing a wide range of subjects. W. M. Stine.

The Liverpool Amateur Photographic Association will hold an auction of photographic goods, the property of members, on Thursday, March 21, 1895. Other societies hard up for subject-matter for an evening, please copy.

Mr. A. L. Henderson writes us in glowing terms of the Algerian weather. Happy man! He has been busy with his camera, and to the Third Annual Algiers Photographic Exhibition contributes over 200 slides made during his stay there.

Lantern Slides, Old and New.—At the meeting of the Photographic Society of Philadelphia, on December 26, 1894, Mr. John C. Browne gave a most interesting talk on the topic *Lantern Slides, Old and New*, exhibiting a collection of slides and photographic relics of the most attractive and instructive character. The collection embraced specimens made principally by members of this Society, beginning about the year 1862 and extending to the present time. Among them were some chromotrope pictures which used to delight an audience twenty-five years ago with their bright colours and ever-changing forms; Woodbury slides made in Philadelphia prior to 1876; positives from gelatine plates made before gelatine plates were commercially sold in the United States; positives by albumen, Taupenot, collodion, washed emulsion, coffee, carbon, and other processes. Some slides were shown for the purpose of illustrating the toning or strengthening of the image by alkaline gold, potassium sulphide, palladium bichloride, platinum bichloride, mercury bichloride, with after-use of ammonia or cyanide of silver.

Snow and Frost in Photographs.—Possibly the snow and the frost have not entirely left us, and in that sad case the following hints taken from *Photographic Scraps* may be useful: "Though a featureless expanse of untrodden snow may be fair to the eye, and rich in poetic inspiration, it is not such a scene that should be chosen as a subject for photography. Even if relieved by shadows or heavy foliage or tree trunks, the result will be disappointing from a photographic point of view. As a subject for the camera we should choose a scene that is well broken up with lighter shadows, with a well-trodden footway and soft undulations where the light and shade of a winter sun can play. If foliage and timber are present, they should be of the lighter sort, as photographic negatives and still more photographic prints exaggerate the shadow parts, and render them much darker than nature. Towards this end we must aim, in our method of development, to compensate as far as possible for this tendency to exaggeration and too strong contrast. By a slow development at first, with less than the normal amount of pyro, we get out carefully all details and then more pyro solution may be added to bring up pluck and vigour. In this way we may easily avoid that blocking up of the shadows with utter absence of detail therein, and preserve the finer details in the brightest points of the landscape. Our exposure must be timed with the same object in view, and should be a full one. What may be considered a proper standard of exposure to work by it is nearly impossible to say, as circumstances vary so vastly. Given a bright day with sunshine, which is best, of course, and no heavy shadows, we may be safely guided by the Ilford exposure meter, and we shall find from it that the exposure will be about three or four times the exposure necessary for open landscape subjects in the summer days."

Transportation Embargo on Gas Cylinders.—On November 15, 1894, says the *American Amateur Photographer*, the five express companies forming what is generally regarded as an expressage pool, including Adams Express, United States Express, American Express, Wells-Fargo Express, and National Express, sent out a notice that, on and after that date, they would refuse to take or carry gas cylinders freshly charged with gas, no matter at what pressure; but they would take such cylinders after a portion of the gas had been used and return them to the manufacturers at full rates. It appears to be an extremely unjust, unreasonable discrimination, looking as if one timid person representing all the companies got it up. Possibly it may have been the explosion of cylinders a year ago at Albany, where the pressure of the gas was 1800 pounds to the square inch, that may have prejudiced this person, whoever he is, against all cylinders. But the large cylinders which have been used for years and carried for years by the several express companies with perfect safety, only have the gas compressed to 225 pounds to the square inch, and the explosion of one through careless handling is rarely heard of. In England the manufacturers of gas enclose their high-pressure cylinders, having the gas compressed to 1800 pounds to the square inch, in a sort of a willow basket network, and the express companies take and transport them with perfect safety. We think the express companies little realise the inconvenience to the consumers, especially those desiring to give exhibitions for charitable or lecture purposes, and physicians, this absurd mandate against gas will create. Instead of making such a prohibitive order, the companies can require the gas-manufacturers to mark the pressure of the gas on the shipping tag, and fix a limit above which pressure they will refuse to take the cylinders; or the manufacturers can be required to basket the cylinders in the same manner that glass bottles or other vessels are basketed. We think, if consumers would show up the absurdity of the present order by sending protests to the several headquarters of the companies, some notice would be taken of it, and perhaps relief be afforded.

Platinum on Glass Mirrors.—Professor C. C. Hutchins writes to *Astronomy and Astro-physics*: "Wright's electrical process, by the deposit in a high vacuum of vapour from an induction spark, is admirable for small surfaces, such as galvanometer mirrors, but is not applicable to large ones. What is wanted is a chemical method, similar to that of silvering, by which a coherent film is deposited from a solution. I venture, in view of the importance of the matter, to refer to some incomplete experiments of my own which seem capable of solving the problem. I send you a small mirror, about 3 × 2 cm., which was coated by such a chemical processs. I have rubbed this mirror hard with the fingers, with rouge, washed it in hot and cold water, and with strong nitric acid. It seems as permanent as the glass upon which it is deposited. The method is as follows:

Solution I.

Chloroplatinite of potassium .....1 gramme.
Water .....6 c. c.

Solution II.

Make a five per cent. solution of neutral potassium oxalate. Warm 100 c. c. of this and add ferric oxalate 20 grammes. Filter and keep in the dark or in a black bottle.

Clean the glass as for silvering. Mix equal parts of I. and II. Have the glass dry and warm; pour a thin layer of the mixed solution upon it, and place it in strong sunlight. The surface tension of the liquid prevents it from running over the edge of the glass, and the plate may be rocked about, if the liquid layer be not too thick. Light reduces the ferric oxalate, which dissolves in potassium oxalate and reduces the platinum. I have experimented upon ordinary lantern slide glasses (3¼ × 4-in.), and have sometimes secured perfect films over the entire surface. Unfortunately, however, there is no certainty about the action, and failure has been more frequent than success. When you get a good film it is very good indeed, and I write this, hoping that some one may be able to suggest some modification by which the action may be made certain. Of course I have tried great numbers of modifications, but thus far have produced nothing better than the above. The fact that it will sometimes work to perfection is proof, nevertheless, that it can be made to alway do so." The editor of our contemporary remarks: "The small platinum mirror sent us by Professor Hutchins is of such excellence as to demonstrate the value of the chemical method of depositing films of platinum upon glass. On account of its permanence, a platinum-on-glass mirror would possess a considerable advantage over the ordinary silver-on-glass mirror, which must frequently be renewed. It is to be hoped that further experiments will be made for the purpose of perfecting the interesting chemical process here described."

Lantern Queries and Answers.

A. L. E.—By reduction, certainly.

Silex.—The index was issued with the Journal of January 4 last.

Sat.—From your description of the saturator, it appears to be the "Optimus" of Messrs. Perken, Son, & Rayment.

Elbe.—Actinically, possibly aluminium has little, if any, practical advantage, but it is pleasanter to use, inasmuch as the smoke emitted is almost inappreciable.

Inquirer.—We cannot say whether Mr. Packham's process of treating platinum prints with vegetable dyes would be applicable to wet plate slides toned with platinum. Possibly not.

C. Wayne.—The stereoscopic transparency sent is rather hard and excessively brilliant. For this kind of picture you should aim to secure softness. A little *visual* flatness is no drawback.

J. R.—Collodio-bromide emulsion for lantern slides and transparencies is supplied by Mr. W. Brooks, Wray Park, Reigate. We know of no other source. The Hill-Norris dry-collodion plates are not, we believe, now issued.

L. Brown (Ipswich).—No, we have not heard anything more of the lantern system wherein "the entire lantern was worked by the lecturer himself from the platform by means of electrical switches, or something of the kind," and we don't suppose we shall.

Slide-maker says: "Can you tell me by what formula the commercial slides on wet collodion are toned? Is it platinum toning?"—In reply: We believe that black tones are obtained by the following:—

Platinic chloride ..... 2 grains,
Water ..... 10 ounces,

to which a few drops of nitric acid are added. For warm browns immerse in

Potassium sulphide (liver of sulphur) ..... 100 grains.
Water ..... 10 ounces.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*April* 5, 1895

THE LANTERN RECORD.

CONTENTS.

	Page
LANTERN NOTES AND NEWS	25
THE SEARCH LIGHT. By RADIANT.	26
LANTERN MEMS. By G. R. BAKER	28
APPARATUS FOR MAKING LANTERN SLIDES BY MEANS OF ARTIFICIAL LIGHT. By A. KAPTEYN	28
HOW TO USE AND TAKE CARE OF A GAS-REGULATOR. By G. R. BAKER	30
CORRESPONDENCE	31

LANTERN NOTES AND NEWS.

At the meeting of the Hackney Photographic Society on the 26th ult., the Chairman (Dr. Gerard Smith), referring to the recent fatal accident by the bursting of a compressed gas cylinder, said that it was worthy of remark that this, in common with former accidents, had occurred with an oxygen cylinder. There had been no case of a cylinder of hydrogen bursting. This led him to infer that some chemical action might take place with the oxygen, more particularly if it were chlorate gas. In making oxygen from potassium chlorate, all the remaining chlorine was not absorbed in the by-product—potassium chloride—but a certain amount of free chlorine passed over with the oxygen. Now, chlorine, acting upon certain metallic oxides, formed chlorine monoxide, a very powerful explosive. It required very little chlorine and very little of the metallic oxide to form a dangerous quantity of the chlorine monoxide. After cylinders had been put to the hydraulic test, a certain amount of moisture would be left inside, which would cause oxide of iron or rust to form in presence of oxygen. The question then arose whether the chlorine would not act upon the oxide of iron to form chlorine monoxide. It would be a matter for experiment to test this. Of course, if the Brin gas were used, no free chlorine would be present. Mr. J. A. Sinclair then gave a most interesting lantern lecture on the *Lakes of Northern Italy*, and illustrated an account of a trip in that district by a collection of very fine slides.

* * * * *

Mr. J. Cheney, of Cedar Villa, Beckenham, sends us his supplementary list of optical lantern apparatus, &c. His specialities are screen stands, self-acting, rolling, opaque, and transparent screens, and these are priced very cheaply.

* * * * *

Mr. R. R. Beard, of 10, Trafalgar-road, S.E., sends us a copy of his illustrated catalogue, the first he has issued. This affords illustrated particulars and prices of his well-known regulator, fine adjustment valves, cylinder regulator, and gauge connexions; gauges, coverings for cylinders, single, double, and triunial lanterns in great variety; objectives, jets, slide-carriers, screens, dissolvers, and other apparatus for lantern work. Many useful hints in lantern manipulation are also interspersed throughout the catalogue.

* * * * *

Of those who cater for lanternists Mr. Beard, besides being the actual maker of many of the ingenious appliances he sells, is also a practical lanternist of great skill and judgment, and can always be depended upon to "run the lantern" at an Exhibition with smoothness and success. Lanternists could not, therefore, possibly do better than intrust themselves to the guidance of Mr. Beard when they are in doubt or difficulty in giving their ideas in projection matters concrete shape.

* * * * *

A new edition of Mr. Kenneth S. Murray's handbook on *The Use of Compressed Oxygen* has been issued. The book is now published at the low price of sixpence. The lanternist will pick up many a valuable idea from this clearly written and well-illustrated little work.

* * * * *

Before the members of the Royal Society, on March 21, Professor Vivian B. Lewes read a paper on *The Cause of Luminosity in the Flames of Hydro-carbon Gases*. The facts which appear to be established in this paper are:—(1) That the luminosity of hydrocarbon flames is principally due to the localisation of the heat of formation of acetylene in the carbon and hydrogen produced by its decomposition. (2) That such localisation is produced by the rapidity of its decomposition, which varies with the temperature of the flame and the degree of dilution of the acetylene. (3) That the average temperature of the flame due to combustion would not be sufficient to produce the incandescence of the carbon particles within the flame. In a paper on the action of heat upon ethylene, brought before the Royal Society this spring, the author showed that the decomposition of ethylene into acetylene and simpler hydrocarbons was mainly due to the action of radiant heat, and was but little retarded by dilution, whilst he has shown in this paper that the acetylene so produced requires a considerable increase in temperature to bring about its decomposition when diluted, and it is possible with these data to give a fairly complete description of the actions which endow hydrocarbon flames with the power of emitting light. When the hydrocarbon gas leaves the jet at which it is being burnt, those portions which come in contact with the air are consumed, and form a wall of flame which surrounds the issuing gas. The unburnt gas in its passage through the lower heated area of the flame undergoes a number of chemical changes, brought about by the action of radiant heat emitted by the flame walls, the principal of which is the conversion of the hydrocarbons into acetylene, methane, and hydrogen. The temperature of the flame quickly rises as the distance from the jet increases, and a portion of the flame is soon reached at which the heat is sufficiently intense to decompose the acetylene with a rapidity almost akin to detonation, and the heat of its formation, localised by the rapidity of its decomposition, raises the liberated carbon particles to incandescence, this giving the principal part of the luminosity of the flame; whilst these particles, heated by the combustion of the flame gases, still continue to glow until finally themselves consumed, this external heating and final combustion adding slightly to the light emitted. Any unsaturated hydrocarbons which have escaped conversion into acetylene before luminosity commences, and also any methane which may be present on passing into the higher tempera-

tures of the luminous zone, become converted there into acetylene, and, at once being decomposed to carbon and hydrogen, increase the area of the light-giving portion of the flame.

* * * * *

At the meeting of the Lantern Section of the Manchester Photographic Society on Wednesday, March 28, Mr. Frank Edwards exhibited slides illustrating *A Holiday in Normandy*. Leaving Southampton for St. Malo, the route chosen was *viâ* Dinan, Mont St. Michel, Avranches, St. Lô, Bayeux, Caen, Lisieux, Rouen, and on to Havre, the point of embarkation for home. The views were chiefly architectural, the churches being well illustrated, also the thoroughfares *en route*, many of which were narrow with projecting upper stories. Mr. S. L. Coulthurst followed next with some bright views of the *Conway Valley*, *Fountain Abbey*, and *Manchester City*, in gay attire, as seen on the occasion of the Queen's recent visit. A miscellaneous collection of Continental and home views, contributed by Messrs. W. Blakeley, W. G. Coote, and F. Edwards, brought to a close a series of interesting and instructive evenings held in connexion with the Lantern Section and the last meeting of the present session. The lantern was manipulated by Mr. J. Whittaker.

THE SEARCH LIGHT.

No topic has been so much discussed in photographic circles during the last three weeks as the fatal cylinder accident at Fenchurch-street Station. The evidence given at the inquest, so far as it has proceeded up to the time of writing, is not sufficient for the formation of any definite theory accounting for the cause of the explosion, but there is a general expectation that Dr. Dupré, the Home Office expert, will give important testimony as to the qualitative condition of the cylinder, which may point to a possible explanation. In the mean while there is a feeling abroad that it would conduce to greater safety in the use of compressed gas in cylinders if the latter were only filled to half the pressure now employed—indeed, the feeling on the point is so marked and general, that it seems to me the compressing companies are bound to take the matter into serious consideration forthwith.

* * * * *

Mr. Chadwick sends me the following notes on the subject:—

"The whole system adopted in this country is *wrong*, in my opinion, *from the start;* we are working at too high pressures. One might reply, Then make the cylinders stronger. But that won't do it. Reduce the pressure is the only way. They don't have these accidents in Germany. The system there may not be so portable as ours, it may not be the best, but it is safe, and the Germans know something of steel-making. But why, in such a case Dr. Kennedy, for whom this cylinder was intended, should bother with the cylinders, is more than could be reasonably argued. A man who wants gas always in the same place, say a school, or at home, or college, let him make the gas for his own use. A cylinder no stronger than a milk can, or an oil cylinder, say two feet diameter by three feet long, will hold nearly ten cubic feet of gas, say *nine feet*, more than is ever wanted at one show. Now, the making of the gas is easy—no more fear of getting impure chlorate than sulphate of zinc for sugar. It could be made up in canisters of various sizes, like a box of limes, only a little larger. Put this in a retort and cover it over a shilling gas stove. Gives nine or ten feet of oxygen in twelve minutes. Now, where is the danger? If the chlorate is pure, as I have said before, there is no more danger than boiling a pint of milk. The chlorate is pure, so no more of that. Where is the trouble? You find the gas cylinder full of water; if you don't, then turn on the tap and fill it, *or* you will have oxygen and air. As the gas goes *in*, the water goes out. The cylinder is full of oxygen now. It may be in the cellar or anywhere. A 16*s.* 6*d.* cast-iron cistern, with ball cock (a commercial article), is fixed eighteen inches above the gas-holder, tap between. Turn the tap. Now the pressure is one equal to eighteen-inch water pressure. You can't use oxygen in a limelight jet at more than this, and everything will stand eighteen-inch water pressure. Therefore we are working at less than one pound per square inch throughout the whole business, instead of 1800 pounds pressure. You know most people in the world don't know what 1800 pounds means. A steam boiler at a mill usually works fifty or sixty pounds; it is considered a high pressure at seventy. A locomotive at 120 pounds is a big thing, but what is 120 to 1800?"

One effect of the unfortunate accident has been to drive a body which is notorious for its stark and solid stupidity into a state of hopeless panic. I allude to the London County Council. On Thursday night in last week I found myself at the Brixton and Clapham Camera Club's Exhibition at Brixton Hall. Mr. Lamond Howie was to give a lantern lecture, *The Scottish Alps* (and a good lecture it proved). Of course a lantern was necessary, but I was informed, and, moreover, it was proved to me by demonstration, that the London County Council, under whose jurisdiction the building is, would not allow the lantern with the gas cylinder to be placed among the audience. Hence the lantern had to be manipulated from the front of the hall, a translucent screen being used, and the oxygen cylinder was *placed outside the building forty feet away*, two lengths of steel tubing having to be laid down for the gases! Moreover, the officials of the London County Council had directed, I suppose for the greater safety of the audience and the building, *that a stopcock should be placed on the lens!!!* This piece of administrative wisdom takes, I submit, not merely the cake, but an entire street of bakers' shops.

* * * * * *

I am reminded by a circular from Mr. P. Everitt, the Hon. Secretary of the London and Provincial Photographic Association, that the sale of members' surplus photographic apparatus will take place at the Association's rooms on Thursday, April 25. I append the conditions of sale, which may be useful to other photographic societies holding rummage sales:—

1. That all articles for sale shall be delivered to the Secretary before seven o'clock on evening of sale.
2. That the owner's name shall not be disclosed without consent.
3. That the articles be on show from eight to half-past eight on the evening of sale.
4. That a charge of 6*d.* per lot and five per cent. commission on the price be made to the seller, but in no case shall the total charge be less than 1*s.*
5. That a charge of 6*d.* per lot and two and a half per cent. commission upon the reserve price be made to the owner upon all lots bought in, but in no case shall the total charge be less than 1*s.*
6. That the charges, less the expenses, be added to the funds of the Society.
7. That all articles must be paid for at time of sale and taken with all faults and errors of description.
8. That all disputes shall be referred to the auctioneer, whose decision shall be final.

The officials of the "London and Provincial" sale are: Auctioneer, Walter D. Welford; Showman, Thomas Bedding; Clerk, Philip Everitt.

* * * * *

The Portrait Tea Company, of Idol-lane, E.C., recently favoured me with the annexed circular relating to their method of selling tea and supplying its purchasers with a kind of overweight in the shape of portraits obtainable on presentation of a certain number of coupons given with the tea. Apparently, by purchasing four pounds of tea at 1*s.* 6*d.* per pound = 6*s.*, you can get three "splendid *cartes-de-visite*," which I suppose the photographer would not care to supply in the ordinary way at less than 1*s.* 6*d.* the three. Knowing something of both the photographic and the tea businesses, I can see that the margin is large enough to allow the transaction being made profitable to the parties concerned. This system of coupon trading dies a hard death. It is fair and legitimate enough, I suppose, and those who expect to get first-rate tea and portraits at the prices named have only themselves to blame if they are disappointed; but I cannot help expressing a regret that its effect is automatically to lower prices among the smaller and poorer professional photographers—a class always to be pitied.

* * * *

Here is the circular:—

"Your Photo for Nothing! With Portrait Tea.—We have made a very great hit with our new method of advertising. In one small district over 5000 persons are added weekly to the drinkers of our matchless teas. Yet we don't paint our name on the skies, nor spend 100,000*l.* a year in displaying it upon every railway, 'bus, tram,

and book. What good would it do to you if we did? Are you any better for the enormous sums spent in such advertising? Not a bit. We succeed because we give our customers the full benefit of our advertising expenses. We spend the money in paying for our customers' own photos, and we have proved this to be one of the most successful advertisements. Next to a good cup of tea, what is better than a highly finished photograph? We rely upon these two things, and we guarantee them both. For your portraits we have contracted with one of the very best photographic artists, who will supply you with high-class cabinets or *cartes-de-visete*, without payment, in accordance with the coupon which is on every packet of our teas. These coupons are stamped with the amount you pay for the tea. Cut them off the packets and save them until they amount to 6*s.*, when you will be entitled to three splendid *cartes-de-visite*, entirely free of charge. If you prefer four cabinets, you must save 12*s.* worth of coupons. *Note.*—In order that you may get your photos quickly, we shall send you an order for the sitting and proof as soon as you have half the above-mentioned coupons, and the photographer will get your pictures ready for you by the time you have purchased the remaining half of the tea; so that you can be photographed immediately you have bought 2 lbs. of our 1*s.* 6*d.* tea, and have your portraits as soon as you have taken the other 2 lbs."

* * * * *

In allusion to a fatal accident at the General Post Office, caused by the "explosion" of a jar of sulphuric acid, a friend writes me of a narrow escape in somewhat similar circumstances. Says he: "Some years ago I was nearly suffocated by the fumes from a burst Winchester of ammonia ·880. Heat was the cause of this, and the force was sufficient to make the stopper cause an indentation of quite a couple of inches in the ceiling. I can imagine heat too would be accountable for this last accident; but you probably may have a better theory. It is only you "knights of the quill" who can give due notice of these deplorable accidents, and by your comments lead us to taking greater care, instead of treating with contempt what I term 'unchained lions, who will go for one on sight.'"

* * * * *

In hot weather the "popping" of the stoppers of ammonia bottles is a very common occurrence, as it also is when the bottles are placed on high shelves in gas-lit rooms or shops. Of course, as my friend hints, volatile chemicals should be stored in cool places, a precaution of which, I believe, few photographers fail to take advantage. By the way, his adventure with ammonia reminds me that on one occasion ammonia was the agent I had to thank for taking me nearer to the other world than I was anxious to go at the time. It was this way: I was handling an empty Winchester, preparatory to putting it to some particular use, and, not knowing what it had contained, took out the stopper, applied my nose to the neck of the bottle, and gave a vigorous sniff. My feelings the next instant were such as I am sure never to forget. The bottle contained ammonia vapour, of which I inhaled sufficient to instantly reduce me to a state of paralytic helplessness. Vainly trying to gasp, to articulate, to breathe, to close my mouth, I leaned against the wall, with the feeling and the conviction that my last moments had come. Some minutes passed in this agony of suspense, and then I gradually recovered, and here I am, baldly and briefly telling you what dangers may lurk in apparently empty bottles. I have passed through the "drowning" process, once I was plucked from the very edge of a railway platform when the Great Western "Flying Dutchman," going at its highest speed, was within a few yards of me; I have been momentarily under cabs and other vehicles, flung off bicycles in crowded streets, nearly "over-dosed" with laudanum, &c.; in short, have given myself up for dead under a variety of conditions, not one of which, however, has impressed me so deeply as that which I have narrated in detail above.

* * * * *

A paragraph for stereo-photographers.—Mr. W. I. Chadwick, of 2, St. Mary's-street, Manchester, has a capital little contrivance for enabling the amateur stereoscopic worker to do correctly what he is so painfully prone to do *in*correctly, that is, to cut, trim, and centre his prints. This is, in fact, a stereoscopic print-cutting shape. It consists of a light metal frame, having two cushion-shaped openings, the size of which is that of the prints. This shape is placed over the uncut print, and the knife (preferably a rotating cutter, cutting on zinc, not lead, says Mr. Chadwick) is run round the apertures and—hey, presto!—there are your prints nicely cut and trimmed and ready for mounting. The shape is adjustable for different centres—that is to say, the two openings may be separated so as to allow of the centres of the prints being made either 3 inches, 3$\frac{1}{8}$ inches, 3$\frac{1}{4}$ inches, 3$\frac{3}{8}$ inches, or 3$\frac{1}{2}$ inches apart. I am always glad to recommend any device or dodge which will promote and popularise stereoscopic photography, and the Chadwick stereo print-cutting shape is so well calculated to be helpful to the stereoscopist that I have no hesitation in bringing it to the notice of my readers, large numbers of whom I know use binocular cameras.

* * * * *

A new monthly journal, the *Clerk of the Weather*, which "is devoted to the coming weather in all its bearings upon human industries and interests in every part of the world," should secure the sympathetic interests of all photographers, amateur and professional. My infant contemporary has set itself no less a task than the forecasting of the weather for all parts of the world a month in advance. By a study of its pages, then, the professional man will know when not to expect sitters, or *vice versâ;* the amateur, again, will be warned of wet Saturdays or apprised when the sun will shine. Here is the *Clerk's* "general character of April weather for England:—April will be unsettled and showery up to the 8th, and from 16th to 24th, with very few showers from 9th to 15th and from 25th to the end of the month. The driest times will be about the 10th and from 25th to 27th, and the wettest will be about the 19th and 20th, when there will be a heavy fall of rain. From Good Friday until after Easter Monday there will be very little, if any, rain."

* * * * *

For the information of those who are looking forward to Saturday afternoon and Easter Monday work with the camera, I extract the following prophecies for those days from a table given. Thus, according to the *Clerk of the Weather*:—

Saturday, April 6, will be "slightly unsettled, with some showers."
" " 13, "half cloudy till evening."
Easter Monday, April 15, "fine, with light clouds."
Saturday, April 20, "fine and partially cloudy till evening."
" " 27, " " " "

According to the above prophecies, April should be a fine month photographically, especially for cloud work. The *Clerk of the Weather* is capitally edited by Mr. Hugh Clements, and is published at 429, Brixton-road, price 1*d.* monthly.

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My friend, Mr. J. R. Gotz, has recently removed to new premises at No. 215 Shaftesbury avenue, W.C., where, having the agency of the well-known house of Thévoz & Co., Geneva, whose superb collographic productions are the theme of general admiration, he intends for the future to devote himself to the furtherance of photo-mechanical work. The other day, when calling at No. 215, I felt a peculiarly weird glamour steel over me, the cause of which I was for a long time baffled to trace. At last I recollected it was in this same building that the members of "The Linked Ring" used to hold high revelry, puff what a friend of mine once called the *calomel* of peace, and quaff the $C_2H_6O+H_2O$ of contentment and joviality. Ah, Apς! would that your redoubtable spirit had hovered over one of those gatherings, so that you might have enlightened the world a little more as to the ignoble conspiracy against genius, which you hint is the *raison-d'être* of the "Ring." But, soft! we are observed by Childe Alfred, from the far-off blue of the tideless Mediterranean, whither he has departed on a photographic pilgrimage. So let us congeal ourselves!

Radiant.

LANTERN MEMS.

THE all-absorbing topic for the month among lanternists, entertainers, and entertained, has been the dreadful explosion at Fenchurch-street Station, and the safety of compressed gas in cylinders. I am most anxious not to touch on debatable subjects in connexion with it while the official inquiry is pending, still I may give particulars of some of the facts that have so far been brought to light, and, as a matter of interest, compare the present state of things with the old plan which some of the lanternists of later days may not be acquainted with, for the result of the third adjournment of the coroner's inquest will not be known before this is in type and on the press.

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THE cylinder in question was made of mild steel lap-welded, and the evidence showed that it was a good one, weighing 15 lbs. 1 oz. without the nozzle, and 16 lbs. 1¼ oz. including the nozzle and valve. It was tested to 3500 lbs. pressure, or nearly double the amount to which it was filled with chlorate of potash oxygen gas, and a similar cylinder has since the explosion been submitted to hydraulic pressure until it burst, and it was not until 7000 lbs. pressure was exerted that it did so. All this points to the cylinder being good; then, what caused the explosion? Witnesses say they saw a flame, but, until Dr. Dupré has made his inspection of the works of the gas compressers that filled the cylinder and given his evidence, any explanation must be more or less in the nature of conjecture, although several experienced engineers and scientific men have theories that deserve consideration and examination, and seem logical.

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WHEN compressed oxygen was first used for the limelight and laboratory purposes, to save the trouble of making as wanted, iron cylinders were used, and the gas pumped in at a pressure of 30 atmospheres, or 450 lbs. to the square inch. The oxygen, at that time, was made from chlorate of potash and manganese by heating the latter in an iron retort having an outlet tube which allowed the gas generated to be conveyed to a purifier or wash bottle containing water, and from thence, by another tube, to a tank or gas-holder, to be afterwards drawn from and pumped into the cylinders. When Brin patented his process for producing oxygen from the atmosphere by passing ordinary air, first chemically dried and purified, through retorts containing dioxide of barium, heated to 1500° Fahr. or thereabouts, steel cylinders were employed, and a much higher pressure resorted to, viz., 120 atmospheres, or 1800 lbs. to the square inch.

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THIS permitted 40 cubic feet of gas being stored in a cylinder of smaller size and less weight than the old 15-feet cylinder, and in fact, bulk for bulk, gave the user four times as much gas as formerly. The increased pressure made its use more difficult with the valve ordinarily fitted to the neck of the cylinder, and so a very ingenious automatic regulator was designed, for reducing the pressure and making the supply constant at the most useful pressure for the particular purpose, such as theatrical limelights or for the optical lantern. Thousands of these steel cylinders have been in use during the past ten years, and only on two occasions have fatal accidents occurred with cylinders containing oxygen.

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THIS, although deplorable, is not such a serious record as when indiarubber gas bags were used, and when oxygen gas was made from retorts without safety valves attached.

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AT the previous explosion at Bradford a boy was killed through letting a steel cylinder containing oxygen fall from his shoulder to the ground, and the expert evidence given at the coroner's inquest tended to show that that particular cylinder was of steel of too great a tensile strength; and the result of a conference of engineers was the framing of certain regulations as to the quality of steel used, the percentage of carbon it contained, a definite weight for a certain size, the hydraulic test it was to be submitted to, and annual repetition of this test; also reannealing every four years, to bring the metal back to a more elastic condition.

THIS annealing seemed to be considered a vital matter, as the constant filling with gas at high pressure and testing hydraulically tended to make the steel more brittle. Whether the cylinder that exploded at Fenchurch-street fulfilled these conditions as to weight, quality of steel, hydraulic testing, and annealing, will, no doubt, be inquired into, and be able to be certified from the disrupted cylinder found; but, as far as can be understood at present, the condition of some form of protective covering, such as rope or wood, insisted on by the railway companies when sending cylinders by both goods and passenger train, was not fulfilled; but this is often the case when cylinders of gas are carried by messengers or limelight operators—in fact, as several witnesses proved, many users of gas are not aware of any regulations concerning cylinders; but, as there has been no evidence to show the cylinder was dropped at the time or prior to the explosion, a rope or wooden cover would not have affected the matter.

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UNDUE alarm should not arise in consequence of this deplorable accident, and it is to be hoped there will not be any suggestion made that steel cylinders of compressed gas be tabooed altogether, but rather that extra and positive precautions be taken to prevent a recurrence of such a disaster. One of the first should be, with the sole object of reassuring the public and making operators quite comfortable in the use of compressed gas—the lessening of the pressure in charging them, say by one-fourth, so that, instead of 120 atmospheres, or 1800 pounds to the square inch, it should be 90 atmospheres, or 1350 pounds to the square inch. This, in the opinion of scientific men, engineers, and chemists, would be perfectly safe pressure with the size and substance of cylinder now in use, and I understand from Mr. Murray, who wrote on behalf of Brin's Company, that they are quite agreeable to compress gas to this amount if the general consensus of opinion of the trade and large users of gas are in favour of it, and, as a temporary measure, are filling to this amount where requested, although they are of opinion that the old pressure of 120 atmospheres is a perfectly safe one with the precautions they and their agents adopt.

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THE railway companies and Board of Trade have had the subject of conveyance and safety of compressed gas before them for some time past, so will have all the particulars at their fingers' ends, and no doubt the Government will have the assistance of representatives of all who are interested in the industries of cylinder-making and gas-compressing and using. Official testing, or stamping, as proof of inspection of test, should be resorted to, as many think will be the case. No doubt the time has come when the whole subject of compressed gas and its use should be put on a footing that leaves it above suspicion, and the trade and lantern operators should, if necessary, combine and see that it is done so, for the limelight is too convenient a light to be shut out from use, while one dreads the thought of any return to large gas bags, cumbersome pressure boards and weights after the comfort of using and carrying compressed gas in cylinders. In fact, the number of limelight lanternists will seriously diminish should there be any prohibition of the use of compressed gas, as it seemed at one time to be more than hinted at by some local and other authorities.

G. R. BAKER.

APPARATUS FOR MAKING LANTERN SLIDES BY MEANS OF ARTIFICIAL LIGHT.

IT is not intended, in the present article to put forward any claim for great novelty in regard to the apparatus which will be described; but, as the text-books do not appear to give the necessary information for the proper construction of such an arrangement as is here recommended, it may perhaps be considered of sufficient interest to describe it somewhat in detail.

Amateur photographers, as a rule, have not much leisure in the daytime, and therefore the opportunities for using daylight to make lantern slides by reduction are rather limited. Moveover, daylight exposures are sometimes much longer than convenient, and a more rapid way of working has, no doubt, great advantages for the amateur who wants to make the most of his time. It is true that, when reducing by daylight from whole-plate and larger negatives to

lantern-slide size, even for warm tones, the exposures are what we may call reasonable, and is a method which gives excellent results. Still, in dull weather, the exposures are far from short, and when smaller negatives, say of quarter-plate size, are thus reduced, the exposures become inconveniently long, especially when warm tones are desired. It is clear that, when dealing with a whole-plate negative, it will catch four times more light than a quarter-plate, and, assuming the general density of both to be the same, the latter will require far more exposure than the former. It is principally for this reason that hand-camera workers will be interested in any method tending to reduce these exposures to a convenient amount.

The apparatus which we have lately constructed for that purpose is in principle an imitation of what takes place when an image is thrown on the screen by means of an optical lantern. Instead, however of using a slide, a quarter-plate negative was, by way of experiment, placed in the slide carrier, and, instead of receiving the image on a whitewashed wall or screen, it was received on the focussing screen of a camera, which was placed opposite to the lantern. By putting these at an appropriate distance from each other, an image of the proper size will be obtained.

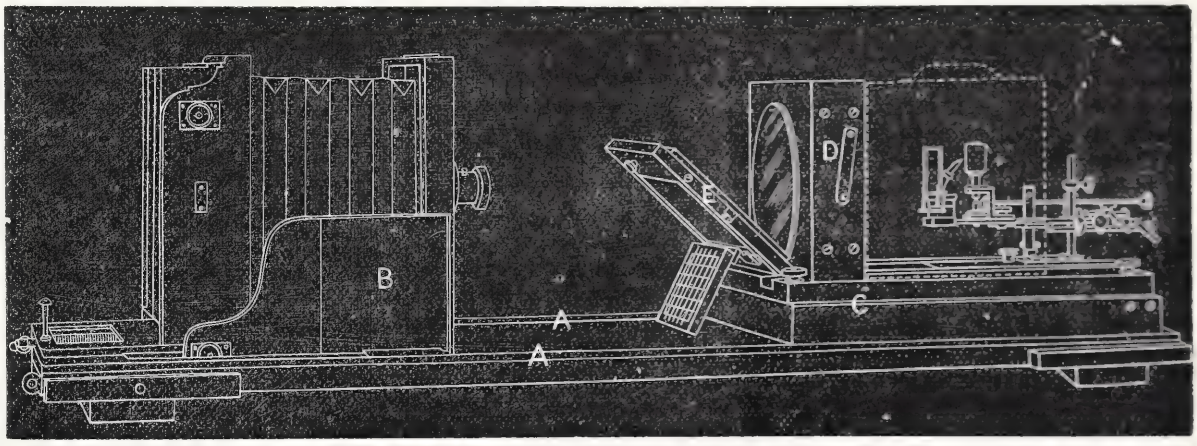
If, with such an arrangement, a trial is made by exposing a plate, the following points will be noticed :—

1. Although the image has been focussed quite sharp on the focussing screen, the developed slide will not be sharp, because lantern lenses, as a rule, are not corrected for photographic purposes. In other words, the focus of the actinic rays does not coincide with the focus of the visual rays.

2. It will be found that, on the developed slide, the corners of the negative are not fully represented, because the condenser, in case it has the usual diameter of four and a half inches, is not large enough to cover a quarter-plate of which the diagonal is five and a quarter inches.

3. In case the negative in question was one on a celluloid film, held between two plates of clear glass, the heat of the jet will have caused it to cockle to a considerable extent, and the use of a water or alum trough would appear to be necessary.

4. If the lantern lens has an equivalent focus of nine inches or more, the camera has to be placed at a considerable distance from the lens, and the general extension of the apparatus becomes inconvenient. It is therefore desirable to use a photographic lens of not more than six inches focal length.



Bearing in mind the above four points, the apparatus, of which we add an illustration, was constructed.

A four-feet baseboard carries two guide rails, A A, between which move, at one end, a camera, B, and at the other end a secondary baseboard, C, upon which is fixed a condenser, D. The camera shown is larger than necessary, but, as it had a flat bottom and had its centre at about the desired height, it admirably suited the purpose. In the same way the secondary baseboard, C, as well as the main baseboard were both used for other purposes, and illustrate how existing appliances may be brought in. Any camera, of course, will answer if it is large enough to hold a lantern plate and has sufficient extension.

On the secondary baseboard, C, there are, behind the condenser, two guide strips, between which moves the base plate of the lime jet, so as to make it possible to move it towards or away from the condenser. In front of the condenser, and as close to it as possible, is a negative-holder, E, hinged to the front edge of the baseboard, C, so as to be able flap it downward ; and it can be fixed vertically by two hooks attached to the casing of the condenser. Now, instead of providing the condenser with an elaborate front and bulky lens mount, a photographic lens of six-inch focus is fixed to the camera opposite, thus leaving the whole space between the lens and the negative open, so as to facilitate the lowering of the negative-holder and the adjustment as well as the dodging of the negative. We shall have something more to say about this negative-holder further on. It is, of course, necessary to adjust the various parts of the apparatus properly with respect to each other. For instance, the bright spot of the lime, the centres of the condenser, the negative, the lens, and the focussing screen must all be placed on the same horizontal line, and care must be taken that the planes of the last four objects be truly perpendicular to the general centre line. Notwithstanding the greatest accuracy in these matters, it will be necessary to put the arrangement to a practical test before it can be declared to be ready for use, and we shall therefore describe somewhat minutely how this test should be carried out.

We might say beforehand that the success of the arrangement as described depends entirely upon the equal illumination of the negative, and we must give warning that it would be entirely wrong to conclude from the appearance of the image on the ground glass that everything was satisfactory. To test the apparatus properly the following method should be adopted. Put a negative in the holder, E, place the camera and condenser at such a distance from each other that, after focussing the image on the focussing screen, it measures, say, two and three-quarter inches in its greatest width, thus leaving a margin of a quarter of an inch on each side, on a three-and-a-quarter inch lantern plate. Now remove the focussing screen and replace it by a piece of opal glass, and set up a looking-glass in such a position (on a chair behind the apparatus) that the image on the opal glass can be seen whilst the jet is being moved backward and forward. The negative-holder should then be flapped down, so as to receive the whole of the illuminated field on the opal glass. Stop the lens down to *f*-45 or *f*-64, and it will then be found that field is far from evenly illuminated. The jet should now be moved forward and backward, it should be raised or lowered, and it should be swung to the right or the left until a fairly even illumination is obtained on the opal glass. When we now put in a larger stop, we shall find a still better illumination of the field, and it is therefore an advantage to use a somewhat large stop. In fact, small stops had better be avoided, as the slightest derangement in the adjustment would tend to produce fatal inequalities in the illumination of the negative. The field, as it appears on the opal glass, consists of a white disc with coloured border, which latter is, of course, utterly useless for our purpose, and the image therefore should fall entirely within the white disc. To ascertain whether this is the case, the negative should be removed and the negative-holder placed in a vertical position. In the apparatus under consideration a condenser of the ordinary type, of seven inches diameter, has been applied, and was found to cover the image field fairly well, with just a tinge of yellow in the extreme corners. This colouration, however, was so slight that it could not produce a detrimental effect of any importance. Moreover, the influence of this slight tinge of colour can be overcome by placing a piece of ground glass between the jet and the condenser. When commencing to work with this kind of apparatus, our friends unanimously advised that ground glass should be used in any case, and they even went so far as to prophesy that, without the use of ground glass the whole thing would be an utter failure. Experience, however, has taught us differently, and it will be as well to describe what we found in connexion with this part of the subject.

Ground glass being a good diffuser of light, we placed a piece of finely ground glass immediately behind the condenser, and the illumination of the field appeared to be very uniform indeed. At the same time that illumination greatly suffered quantatively, and the exposures became inconveniently long. In fact, the exposure of some plates soon showed us that the ground glass necessitated exposures at least forty times longer than without ground glass. To counteract this,

the ground glass was rubbed over with vaseline, and most of it rubbed off again, and this somewhat reduced the exposures; but, in carefully examining the image on the focussing screen, the imperfections of the vaselined ground glass were plainly visible, no doubt due to the depth of focus of the lens. The ground glass had therefore to be placed farther away from the condenser. Whilst doing this it was noticed that the illumination of the field became much more intense, and therefore the two drawbacks just mentioned were overcome simultaneously by placing the ground glass very near to the jet. Frequently the mixing chamber of the jet carries prongs, between which a piece of glass is placed to protect the condenser against sparks or against the rebounding flame from the jet, and the ground glass referred to is best placed between these prongs, as shown in the illustration. The piece should, however, only be just large enough to prevent the jet from *seeing* the condenser, and two inches square will be found sufficient. Of course, the larger the piece of glass, the more unequally it will be heated and the more frequently it will be cracked by the heat. In following this plan we finally reduced the exposure to about three or four times more than were required when no ground glass was used. There is, however, another objection, viz., the vaseline gradually evaporates, and makes the ground glass again less transparent, and consequently introduces an element of uncertainty. It would therefore be preferable to use a piece of extremely fine ground glass without applying vaseline; but there is really no strong reason why any ground glass should be used at all, and we prefer to use none whatever, except when it is desired to purposely increase the exposures, as in the case of very weak and thin negatives.

As to the heat of the jet affecting film negatives, we found that, with a seven-inch condenser, the jet had to be pulled back to such a distance that no harm was done to them, and therefore the water or alum trough which we first intended to use was not applied.

The brightness of the jet should be kept as uniform as possible, and this is a matter in which some care is necessary. We, of course, take it for granted that automatic regulators are used. Many jets nowadays are provided with a cut-off or bypass, and this greatly facilitates the operations, inasmuch as the light can be turned on and off without disturbing the taps, which admit the proper quantity of gas to the jet. A good plan is to light the hydrogen flame before the lime is put on, and to regulate the flame to a predetermined length of so many inches. The lime is then placed in position, and the oxygen is admitted in such quantity as will give the best light with the fixed amount of hydrogen. In this way a fairly constant light can be obtained from day to day, whereas, in the course of the same evening, the taps are not disturbed, and the jet is entirely worked by means of the bypass. This has the additional advantage that gas is only consumed during the actual exposures.

The illustration shows a total absence of casing surrounding the condenser and jet, and it might be thought that stray light could interfere with the proper working of the lens. This, however, is not the case; the negative-holder is so made that only the light which comes through the negative can reach the lens, and, as for diffused light being reflected from the wall and ceiling of an ordinary room, we do not think that any account need be taken of it. It is, however, disagreeable and hurtful to the eyes to look at the powerful lime jet, and, therefore a light wooden hood is provided, as shown by dotted lines, which is placed over the jet when all is in working order.

The negative-holder, as will have been noticed from the illustration, is of peculiar construction. It consists of a frame, E, hinged to the front edge of the condenser baseboard. This frame holds, on the side facing the condenser, a movable negative-holder or carrier, with a rebate to take a quarter-plate and which is clamped to the hinged frame by means of thumb screws, through oblong slots provided in the latter. By this arrangement, the position of the carrier and its negative can be shifted with respect to the hinged frame, in order to correct matters if the image is not square on the glass, which is frequently the case in hand-camera work. It is, however, very difficult to judge, when the negative is in the carrier, whether its horizontal or vertical lines are in their proper positions to photograph square on the lantern plate, and it would be far too troublesome to go forward and backward from the focussing screen to the negative in order to arrive, by various adjustments, at the final correct position. We therefore devised a gauge screen, with a number of horizontal and vertical threads, which is hinged to the negative-holder as will be seen in the illustration. The threads on this gauge screen have been so placed that they photograph proper and square on the lantern plate, and, therefore, when the negative-holder is put upright, the gauge screen is swung against the negative, and then the latter can be adjusted, by means of its movable carrier, until its horizontal and vertical lines are parallel to the cotton threads of the gauge screen. As soon as this is accomplished, the gauge screen is lowered and the exposure can take place. We found this gauge screen a very great convenience in working and economising a great deal of time.

As stated, the apparatus we employ contains an ordinary condenser of seven inches in diameter and we find that it is none too large for reducing quarter-plates. In fact, we consider that an eight-inch condenser would be still better. There are, however, condensers of a more perfect type in the market, and, through the kindness of Mr. Dallmeyer, we had the opportunity of testing in this apparatus a six-and-a-quarter inch condenser of superior make, which covered a quarter-plate at least as well as the ordinary seven-inch condenser which we are using.

It is important to remember that for the best illumination of the field the lens must be placed at the apex of the cone of rays issuing from the condenser, and as the lens is at a fixed distance from the negative, in order to obtain an image of a definite size on the focussing screen, the apex of the cone of rays itself has to be shifted, so as to fall in the lens, which is done by changing the position of the jet with respect to the condenser. It is therefore necessary to retest the equal illumination of the field for every change of size of image on the focussing screen. In other words, the position of the jet for a certain proportion of reduction will not do for a different proportion of reduction; but, with a reflecting mirror behind the apparatus, this retesting can be carried out very expeditiously.

Before concluding we might say a word or two about the backing of lantern plates. A great deal is always said, and justly so, in favour of backing our plates for camera exposures, and we think it strange that nobody seems to advocate the backing of lantern plates. We have made comparative tests in regard to this, and we are convinced that the quality of most slides is greatly enhanced by applying a suitable backing. Most amateurs, however, very naturally dislike this dirty messing in the dark, and they would, no doubt, be prepared to pay a trifle extra for their plates if the manufacturers did the backing for them. We think that, if this demand were put forward more frequently, one or two enterprising firms would soon start in this direction, and supply all their plates either backed or not backed at choice; and they would, no doubt, do a good business, compelling the other manufacturers to follow. A. Kapteyn.

HOW TO USE AND TAKE CARE OF A GAS REGULATOR.

It may seem almost unnecessary from the point of view of the practical lanternist and "old hand" for anything more to be written about what many consider a simple apparatus, which can be dismissed in a few lines as far as directions for use are concerned; but, when one acknowledges—as few, I think, will hesitate to do—the important part it plays in limelight matters now compressed gas is almost entirely used by lanternists, there will not be much difficulty in justifying the following remarks and suggestions. The first thing is to realise what the regulator is for, and, if this is understood by the majority of users, it is evidently not by a fair number representing the minority; for on several occasions, in public and private exhibitions, I have found the operator regulating the gas by the valve of the gas cylinder when using a regulator the same as he had been in the habit of doing when only a nozzle was fitted to the cylinder. This must once for all be dismissed as entirely wrong, and the mind must be brought to realise that the regulator is a miniature gas bag, automatically filled and emptied by the gas passing into it from the gas cylinder, and the spring pressing it out as soon as the taps of apparatus are turned on to permit of its escape. The pressure at which the gas is delivered from the regulator (miniature bag) depends upon the strength of the spring, whereas, if the taps of jet are left *open* and the regulation is done from the cylinder, the regulator is unnecessarily taxed, for there will be a constant flow of gas right through it, and more gas than is wanted passed. (See note of experiments at end). The strength of the spring of the Beard regulator is such that it exerts a pressure on the gas in the miniature bag equal, when working, to about three feet six inches of water pressure. This is as much as can possibly be wanted for ordinary limelight purposes. The maximum used with the large gas bags of old represents twelve inches of water pressure, but, for special purposes, an extra strong spiral spring could be adapted in Beard's regulator by unscrewing the brass cap and substituting one spring for the other.

The screwing on again (after taking off) the brass cover can be done simply or awkwardly, and this remark applies to most large screws, such as condenser cells and objectives.

It is not known so generally as it should be that it is a matter of chance if the correct thread of the screw is found if one turns to the right straight away, and very often the threads will get crossed, but if turned to the *left*, while being held as truly as possible, and a little pressure exerted until a click is heard, it will be *known* that the commencement of the thread is found, and the cover can then be screwed up the right way. A golden rule with all screws is never to force them, and, if something stops the way, turn back and commence again.

In turning on the valve of gas cylinder (Brin's type), it is only necessary to make half a turn of the key or lever, *i.e.*, through about 180°, and ample gas will pass to fill the regulator and keep up the supply. The lever keys are much more convenient to use than the T-shaped one, as more purchase is obtained in turning on or off, and here I may incidentally remark that, if *great* force has to be exercised to either turn on or off, and prevent leaking, instructions should be given, at next time of filling the cylinder, for the gland and valve to be corrected.

In selecting a regulator it should, if possible, be one to suit the particular cylinder, so as to avoid as far as possible intervening adapters, for each adapter means a possible source of escape of gas, if excessive care is not taken.

Washers are not necessary if a true turned fitting is used, such as the bull-head fitting of cylinder, and, if a gas-tight joint cannot be obtained, they should be ground together to make them so. If at the last minute it is found there is a leak at the joint, it can be temporarily made sound by insertion of a moulded cone of either lead or leather. Grease should not be used for any joints beyond putting the least possible amount of tallow on, and then wiping it off *thoroughly* with a rag.

The Life of a Regulator.—There is very little to wear in the Beard form of regulator but the indiarubber bellows, and that can readily be replaced. The time for doing this will depend upon the amount of use and where the regulator is kept. Like all vulcanised rubber articles it is preserved best in a moderate temperature, and if fairly used will last three or four years without renewing. If used in hot climates, a vegetable oil, such as cocoanut, can be rubbed upon the bellows with advantage, and will prevent its perishing or hardening. Two or three times a season the brass cap should be removed from the regulator, and the bellows inspected. If any doubt exists, put the regulator on a cylinder, and, placing the finger over the outlet of regulator, turn on the valve of the cylinder a quarter turn; if it fills out the bellows, and continues to do so after withdrawing finger from outlet pipe for a second and replacing it, then it may be known to be all right. This, however, can be ascertained by sound before any exhibition, for, when the same thing is done with the cover on, it can be heard to fill and exhaust at each covering or uncovering of the outlet pipe with the finger. It is as well to forward the regulator every third year to the firm where purchased, and ask them to have the lazy-tongs, levers, and valves inspected, and preferably this should be done in the summer time, or early autumn, before the manufacturer is busy for the lantern season.

Care of a Regulator.—When not in use, the regulator should be kept in a moderately warm and dry room and not stowed away in a cold or damp place, a moderate temperature being best for the india-rubber bellows and the non-corrosion of metal work.

To renew a bellows of a Beard's regulator proceed as follows: Cut off the threads with which it is tied, taking care not to twist the rising plate or top, then strip the metal of the rubber, so that the lazy-tong, lever, and the joint of the rising plate can be got at and held tightly by pliers, then unscrew the plate and take the old rubber off. See that the metal is quite clean and free from old rubber befor putting on the new, now stretch the new rubber over the bottom or basis, observe it is equal all round same, then screw on the rising plate, making the joint under with a luting of white lead and then stretch the top of the rubber bellows over the plate and bind with thread. Regulators are apt to appear out of order because dirt or particles are left in the valve of the cylinder or connexions and blown into the regulator; so, in order to prevent any risk of damage to regulator, care should be taken to wipe out the valve of cylinder and clean the screws of connexions with a rag. As a further safeguard I suggest, before connexion of a regulator, to place the cylinder on its side or upside down, and turn on the valve of same for a second, so that a good puff of gas comes out to blow any settlement from the valve or discharge any condensation of moisture.

If dirt, &c., gets blown into the regulator, it is liable to prevent the valve from automatically closing, and the gas immediately accumulates in the bellows until it is sufficient to blow off the bellows. It may be wondered why the bellows are tied on, and not fixed in a substantial way; but, if by any chance that which has been described above should happen, the inventor's idea is that the bellows should blow off, and so prevent a more serious rupture, much in the same way as a safety valve is fitted to a steam boiler. That it is not often that anything is likely to interfere with the practical working of these automatic regulators may be judged by the small percentages of repairs or failures, and this notwithstanding no special cautions or instructions have been issued for their use and preservation; and the same thing speaks volumes for the usefulness of the invention for practical lantern work which has now been proved to be indispensable with compressed gas at high pressure, when using two or more lanterns, or one with a cut off, and a comfortable adjunct to the lanternists when using a single lantern of ordinary type.

Experiments.

In order to test the effect on pressure during working when using the regulator as it is designed to be used, and also when the adjustment of the light is made direct from the cylinder valve, also to see what pressure the regulator bellows was subjected to by the compressed gas when valve was open the half turn as described, the following experiments were made:—

A best form of mixed gas jet was used with two cylinders filled to 120 atmospheres' pressure, with a Beard's automatic regulator fitted with a pressure gauge attached by an elbow piece to one of them. The indiarubber tubes were connected so that the hydrogen went direct to the hydrogen tap, and the oxygen, by means of a T-piece, went partly to a special pressure gauge showing inches of water pressure up to ten feet, and the remainder of the oxygen by a second tube direct to the oxygen tap of jet. On turning on the valve of cylinders, this special gauge showed with the taps of jet turned off eight feet six inches of water pressure; but, when the tap was turned on a little, then only six feet, and, on getting a good light, five feet of water pressure. This, by repeated trial, was about the average pressure when the maximum light was obtained without the jet roaring, and it is fair to assume that the difference between the eight feet six inches when taps were off, and five feet when arranged for best light, represents the working pressure, viz., three feet six inches.

Let us now see if it is verified another way by adjusting the light to its maximum without roaring, turning off the bypass or single dissolver, then the hydrogen tap altogether, and fastening an india-rubber tube from the nozzle of jet to the special gauge, and letting the oxygen from tap into it by turning on bypass. The gauge then showed three feet two inches of water pressure, verifying the deductions made by the first trial. Different kinds of jets give different results, and some forms of mixing boxes and nozzles permit of a greater working pressure being employed than others.

As a contrast, using the cylinder with the regulator on as if it was a cylinder with the nozzle only, and the taps of jet full on, the light was gradually raised by means of the valves of cylinder, first hydrogen and then oxygen, until the best light was obtained without roaring. The special gauge then showed two feet five inches of water pressure—in other words, six feet of water pressure was being expended in the light in this way against three feet six inches pressure when used as intended, showing a great waste of gas; for, on testing the amount from the nozzle after turning off the bypass, and then the hydrogen tap of jet, and again turning on the bypass after connecting the nozzle of jet with gauge as before, so that the same amount of oxygen gas might flow through as when alight, the gauge showed three feet four inches of water pressure.

From this trial it seems fair to conclude that the only time such a course is justifiable, *i.e.*, regulating direct from cylinder with jet taps open, is when an excessive light is required at the expense of variation of light, and probably a roaring noise. At all other times the entire regulation of light should be performed by the taps of jets.

G. R. Baker.

Correspondence.

TRANSPORTATION OF GAS CYLINDERS IN AMERICA.

To the Editor.

Sir,—Referring to The Lantern Supplement of March 1, the quotation from the *American Amateur Photographer* concerning the transportation of gas cylinders contains some inaccurate statements. There is no "expressage pool" of any name or nature in the United States. On the contrary, the express companies of the United States are engaged in a very energetic, independent competition with each other, somewhat of the nature of the competition between the Kilkenny cats. They did, however, agree in the view that the transportation of gas cylinders was a

very dangerous matter, and each company gave notice that they would not transport them.

The writer of the article in the *American Amateur Photographer* is not fully posted in the history of the matter, because the explosion at Albany, N.Y., by which a number of persons lost their lives, is not by any means the only explosion of these cylinders which has occurred in the United States. An explosion occurred in a railway car *en route* which did great damage, although not attended by loss of life. Another explosion occurred in one of the express waggons (or vans), causing great damage. In another case a cylinder which had been stored in the basement of an express office in Kansas was brought out of the basement preparatory to delivery to the consignee. Fortunately, the express agent left the office for his dinner, and locked it up. During his absence this cylinder exploded, and blew out the entire front of the building.

One rather amusing feature developed in the controversy ensued upon the refusal of the express companies to carry these cylinders, viz., each manufacturer was willing to admit that the cylinders made by his competitor would explode, but he would not admit that his own would explode under any circumstances.

It appears also from known facts that cylinders filled with gas for other than photographic purposes will explode. The writer was told not long since by a very prominent dentist that a gas cylinder exploded in his office. The cylinder was fired through the ceiling of the room like a shot from a rifled gun. The heavy iron base which held it was blown through the floor into a drug store beneath, causing altogether considerable damage, but fortunately no loss of life.

It should, however, be stated that for some time past several of the express companies have resumed the carriage of these gas cylinders, although with some misgivings as to the results. The refusal of transportation created such great inconvenience to the public that some of the companies were almost forced to take the risk of transportation. It is believed, however, that, sooner or later, the companies will require some sort of protective covering which will lessen the risk of explosions.

—I am, yours, &c., EXPRESSMAN.

Chicago, U.S.A., March 14, 1895.

DISCOVERY OF HELIUM.—In seeking a clue to compounds of argon, I was led to repeat experiments of Hillebrand on clèveite, which, as is known, when boiled with weak sulphuric acid, gives off a gas hitherto supposed to be nitrogen. This gas proved to be almost free from nitrogen; its spectrum in a Pflücker's tube showed all the prominent argon lines, and, in addition, a brilliant line close to, but not coinciding with, the D lines of sodium. There are, moreover, a number of other lines, of which one in the green-blue is especially prominent. Atmospheric argon shows, besides, three lines in the violet which are not to be seen, or, if present, are excessively feeble in the spectrum of the gas from clèveite. This suggests that atmospheric argon contains, besides argon, some other gas which has as yet not been separated, and which may possibly account for the anomalous position of argon in its numerical relations with other elements.—Professor W. RAMSAY, F.R.S., in *Chemical News*.

THERE is an interesting note in the *Bulletin* of the Royal Gardens, Kew, on the use of green glass in plant houses. The use of glass of a green tint has been for half a century a characteristic peculiarity of the plant houses at Kew, having been adopted in 1845–6 on the recommendation of Mr. Robert Hunt, F.R.S., on the ground that, while admitting light and chemical power in the same proportions as white glass, it would obstruct the passage of those rays which produce scorching. Recent investigations have, however, shown that the green glass used at Kew intercepts about one-half of the effective influence of ordinary sunlight on the processes of plant life. Of late years the increasing haziness of the sky, due to the smoke produced by the rapid extension of London to the south-west, has produced the same effect at Kew as the use of green glass; and it has become obvious that in the future the plant houses must be so constructed as to exclude as little of the available sunlight as possible. Since 1886 the use of green glass has, therefore, been discontinued in all the houses except the fern houses and the palm house; and, it having been proved by experiment that even filmy ferns thrive better under white than under green light, if direct exposure to the sun is excluded, the use of green glass will now be altogether abandoned at Kew.—*Nature*.

"UPON THE ADVANTAGES OF A SMALL CAMERA."—The following suggestions have been thrown together mainly for the benefit of a large and ever-increasing body of workers who wish to produce large pictures, but with as economical an expenditure as possible. To such I would unhesitatingly offer the advice, "Work a small-sized plate and enlarge." Now, when such a course is recommended, a half-plate, or possibly a quarter-plate camera, is usually selected, but I would advocate an even smaller size, namely, $3\frac{1}{4} \times 3\frac{1}{4}$, and my advocacy is based upon personal practical experience in the every-day use of all three sizes. There is very much to be said in favour of a small plate from an amateur worker's point of view, and nearly every objection that could possibly be urged against the system can be satisfactorily disposed of. In the first place, a small short-focus lens is, both optically and practically, a more perfect instrument than one of the same class but of much longer focus; it has more depth, can be used with a larger aperture, and is generally to be preferred. "Oh, but I cannot see to compose and arrange my picture upon a plate of such Liliputian dimensions, and the composition of my pictures must necessarily suffer." An entirely mistaken notion, dear reader, though a fatal objection if well founded. I must at the same time confess that this was a point upon which, when I first adopted the small size I am now recommending, I had many misgivings, but very little practice dispelled them at once and for ever. It is simply a matter of use, and I have no hesitation in saying that it is as easy to compose and arrange a small picture as a large one, and I say so after some twenty years' experience with cameras of every size from 12×10 downwards. In regard to the amount of subject included, it must not be forgotten that that is determined by the relation between the focal length of the lens and the base line of the plate, for, by using lenses of suitable focal length, we may obtain any required angle, or, in other words, any desired amount of subject upon our small plates. Now that enlargements have so grown in public favour, it is perhaps unnecessary to reiterate further arguments on their behalf, but it may not be without interest to point to the indisputable fact that a very large proportion of the most successful exhibited work now owes its origin to this method of production. My chief reason for recommending $3\frac{1}{4} \times 3\frac{1}{4}$ plates in preference to the more familiar $4\frac{1}{4} \times 3\frac{1}{4}$ lies in the fact that the former can be enlarged up to the corners in any optical lantern fitted with the standard 4-inch condenser, whereas quarter-plates would require a $5\frac{1}{4}$-inch condenser—or, in other words, a more costly enlarging apparatus. Moreover, lantern slides can be made by contact—the easiest and most expeditious mode of producing them—and the whole of the subject preserved, whilst with quarter-plates the slide must either be made by reduction, or a portion of the subject sacrificed. To lecturers, travellers, or those who use photography as a "recorder," or to amateurs generally who wish to extract as much amusement from their hobby with as small an expenditure as possible, this system of working specially commends itself. I am not theorising, reader, for last summer I put the suggestions I am now venturing to lay before the readers of *Scraps* into actual practice. Let me briefly describe my kit, and at the same time throw in such advice as the experience gained during a season's work with it may suggest. In the first place, the camera is a square bellows $3\frac{1}{4} \times 3\frac{1}{4}$, made for me by Perken, Son, & Rayment, and fitted with rack-and-pinion adjustment. It has no swing back, but a great range of rise and fall to the front. I would, however, recommend any one building a similar instrument to have a swing back, for it is just as much needed in a small as in a large camera, especially if architectural work is attempted. I generally carry four lenses—a 3-inch portable by Ross, a 5-inch ditto, a Wray rectilinear of 6 inches, and a Taylor ditto of $7\frac{1}{2}$. It is, of course, necessary to have a variety of focal lengths, in order to be able to alter the angle of view at will; but, if only one lens is to be used, I would recommend that that should be a good one, preferably a Goerz Anastigmat or one of Taylor's new triples, the marginal definition being so much better when large apertures are used, a great desideratum when the negatives are intended for subsequent enlargement. The camera is provided with six double backs of the ordinary pattern; the whole kit goes into a neat leather case $8 \times 5 \times 5$, and weighs about $3\frac{1}{2}$ pounds, exclusive of the tripod, which weighs 17 ounces, and deserves a paragraph to itself. It is one of the Sciopticon Maux stands; when fully extended it is about 5 feet high, has adjustable legs, and, when somewhat shortened, is one of the steadiest stands in a wind that I have ever used. Such a kit can be taken anywhere; mine has been all over South Devon and a part of Cornwall, in which district I spent last summer's vacation, and, oh, the comfort of it! never before have I derived so much real enjoyment from a photographic holiday. Those who have worked on such occasions with a whole-plate camera, and conscientiously "done" a particular district, will bear me out when I say that only the favoured few who happen to be endowed with the thews and sinews of a Sandow can appreciate a holiday undertaken under such conditions. On such occasions my camera, like a faithful dog, is my constant companion, and, rain or shine, it accompanies me whenever I venture abroad, for experience has taught me that in photography, as in most things mundane, the unexpected always happens, and the best pictures present themselves when the camera has been left at home. A direct print from a $3\frac{1}{4} \times 3\frac{1}{4}$ plate looks rather insignificant, but I would point out that, where only one or two prints from a negative are required (and the majority of amateurs seldom want more), it is really less trouble, and, during at least half the year, far more expeditious, to make an enlargement than a direct print. With $3\frac{1}{4} \times 3\frac{1}{4}$ plates, the work of enlarging can be done in the ordinary optical lantern with a 4-inch condenser, but better results, as regards definition, will be obtained if, in lieu of the ordinary lantern objective, which is seldom very perfectly corrected, a rapid rectilinear is substituted. I have lately been using the Welsbach incandescent gaslight for showing slides at home, and also for enlarging; for both purposes it is far better than an oil lamp, and the loss in candle power is more than compensated for by the superior whiteness of the light. For enlarging work it is almost perfection—clean, simple to use, and very actinic. Some may object to a square picture, and it must be conceded that it is a shape not suited to all subjects, though one that might be employed with advantage far more frequently than it is; still, there is no necessity to use the whole of the plate, even though it be only $3\frac{1}{4}$ inches square, for an oblong $3\frac{1}{4} \times 2\frac{1}{2}$ makes a very pleasing proportion for those who prefer to be more orthodox in the shape of their pictures.—JOHN A. HODGES, in *Photographic Scraps*.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*May* 3, 1895.

THE LANTERN RECORD.

CONTENTS.

	Page
LANTERN NOTES AND NEWS	33
THE SEARCH LIGHT. By RADIANT	35
LANTERN MEMS. By G. R. BAKER	36
GAS CYLINDERS. By W. I. CHADWICK	37
DAVENPORT'S COMBINED CURTAIN SLIDE AND PANORAMIC CARRIER	38
MODERN LANTERN-SLIDE METHODS. By JOHN CARBUTT	38
ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES. By JOHN H. JANEWAY	39
A STEREOSCOPIC TRANSMITTER	40
LANTERN QUERY	40

LANTERN NOTES AND NEWS.

Mr. F. H. Wenham writes to the *English Mechanic* in reference to the recent cylinder explosion: "Referring to the recent explosion of an oxygen cylinder in Fenchurch-street Station, by which William Holbrook, the man in charge, was instantly killed, it was stated by a person who witnessed the accident, that at the moment of explosion a flash of fire or sparks issued from the spot. By the exit of air or gas from the rending of the containing vessel from excess of pressure, not any heating takes place in the volume of liberated gas that can produce the appearance of flame. On the contrary, intense cold will occur from expansion. We have it on record that an oxygen cylinder, stored in a railway luggage department, exploded after lapse of several days. Fortunately, no one was injured.

"There is no instance on record of a *hydrogen* cylinder exploding under similar pressure, simply because no chemical combination or alteration can take place within the receptacle; pure hydrogen is not a supporter of combustion, and there are no conditions in existence that can cause an explosion. The most probable cause of the explosion of oxygen-gas cylinders arises from a kind of spontaneous ignition by the combination of the oxygen with the iron of the cylinder. An influence once set up, that would be very rapid in its action, and quickly spreading at a white heat over the whole of the internal surface of the cylinder, causing such an expansion of the gas and enormous internal pressure, that the metal, weakened by heat and waste of substance, is immediately ruptured. An increase of temperature of a little over 400° in the body of gas doubles its volume, with an increase of twice the pressure. I recollect an occurrence—I think in one of Faraday's experiments—in which oxygen gas was being pumped into an iron bottle. At a certain stage of pressure the heat of compression from the condensation of the gas in the pump fired the oil with which the valve was lubricated. The whole cylinder, or bottle, became intensely hot—fortunately without rupture.

"When cold, the whole of the contained oxygen had combined with the iron of the receptacle. This was then cut open, and it was found that the entire interior surface had been in a state of fusion. Metallic iron in a state of fine powder, or extreme mechanical division, will inflame spontaneously if immersed in oxygen gas. Probably, sheet iron, with a roughened unoxidised surface, might eventually get heated if immersed in oxygen gas, or a few filings left in the cylinder, or even a projecting filament suffice to originate the combustion, for we have here in proximity two elements capable of the most violent action at the time of their combination. A bundle of iron wire alone makes an intense and brilliant fire, if blown with a jet of oxygen gas. The question is, How can these assumptions be tested?

Let a cylinder be drilled through, and an insulating plug inserted in the hole, containing the usual electric terminals connected by a fine platinum wire in the interior. This wire should be surrounded by a pellet of either charcoal—fine iron filings—or even be wrapped round with paper, the cylinder to be duly charged, and carried to a safe distance. The terminals connected to a galvanic battery would heat the platinum wire, and ignite its combustible envelope; we could thus ascertain if the combustion spread over the whole interior of the cylinder, which I believe it would do, and probably cause an explosion. We here have oxygen compressed, and stored in direct contact with metallic iron, quite unprotected from any violent action in the form of ignition that may accidentally take place. Therefore the remedy should be: Before the cylinders are charged with gas, let the interior be so thoroughly protected with a coating of oxide as to be incapable of further oxidation from the contained compressed gas. This operation might be very easily effected during the time that the cylinder is being annealed, and while at a dull red heat let a jet of steam be directed into the neck or orifice. This would form a dense coating of black deutoxide on every exposed part and particle of the iron, and is, in fact, 'Barff's Rustless Iron' process on which oxygen has no further action."

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It is announced that, as the result of action taken by the local authorities, in conjunction with the Office of Works, the desecration of Nelson's Column and public buildings in Trafalgar-square by advertisers, by means of search lights, has been stopped. "Desecration" is, we think, here a slightly misapplied term; but we are glad, nevertheless, that a nuisance has been suppressed. St. Martin's Church, the National Gallery, and, worst of all, several private houses in the Square were frequently converted into backgrounds for this intrusive search light.

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Writing of acetylene apparatus in the *Scientific American*, Dr. T. O'Conor Sloane says: "Few chemical discoveries have attracted more interest than the recent one of the method of manufacturing acetylene on a large scale. The production of the calcium carbide from which the acetylene gas is made by simple treatment with water bids fair to become a commercial process, and we have every reason to hope that the material will soon be produced by the ton. There is something fascinating in the idea of being able to evolve a gas of about 300-candle power by so simple a process. While the crudest possible apparatus, such as a tumbler of water, is sufficient to illustrate the production of the gas, the object of the present article is to show how a better demonstration can be produced with very simple appliances. To show the gas with a tumbler of water, it is sufficient to drop into it a piece of the calcium carbide as large as a pea; the gas is at once evolved in large quantity, and a match can be applied repeatedly to the accumulation of bubbles on the surface of the water, giving a number of successive lightings. The apparatus is constructed from a battery jar and lamp chimney as the principal elements, and is made on the lines of the old hydrogen evolution apparatus.

"To the top of the lamp chimney, which should be of large size, a cork should be tightly fitted. Unless the cork is better than the majority, it should be waxed or paraffined, which is very easily done by placing some fragments of wax or paraffin on it, and melting the material with a hot soldering iron or poker. Through a central perforation a tube is inserted, fitted with a stopcock and a gas burner; the latter must be of the smallest size made, the Bray fish-tail burner answering about the best of any yet tried. Merely to exhibit the gas, a simple jet may be made by drawing a glass tube almost to a point, or by drilling a very small hole in a cap fitted to the pipe leading from the stopcock. To a hole a little to one side of the evolution pipe a wire passes, which moves up and down with some friction through the hole. Its lower end is formed into a hook, to which is suspended a little basket made by bending up a little bit of coarse wire gauze. A piece with quarter-inch meshes will be about right. The suspending wire is bent at the top to give it a better handle.

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"To operate it, the lamp chimney is placed in the jar, the water is poured in until within an inch or two of the top, and a piece of calcium carbide half the size of a walnut is placed in the basket, which is drawn up until pretty close to the cork. The cork is now placed in the lamp chimney and pressed down so as to make it fit tightly, and the wire slowly worked down until the basket becomes partially immersed in the water. The level of the water is at once depressed as the gas is evolved, and if the cock is open the air and gas within the chimney begin to escape. As soon as the odour of the escaping gas is strong it can be lighted, and will burn for five or ten minutes with great steadiness. If the pressure decreases and the water rises, it comes in contact with the calcium carbide, more gas is evolved, and it falls again.

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"The apparatus may be further simplified by omitting the stopcock, which is unnecessary, and a bucket may be substituted for a battery jar. It may also be necessary to secure the chimney against floating upwards, although in the apparatus shown this is quite unnecessary. It is well before lighting the gas to hold a test tube over the outlet for a few seconds until filled with the gas, and to light it with a match or at a gas burner. If the contents do not explode, it is safe to light the jet on the chimney; if it does explode, the light should be deferred until purer gas is evolved. Two or three minutes are sufficient to get it in working order. It must also be remembered that it is essential to have a very small burner, as otherwise the gas will smoke and the supply will be insufficient to obtain a satisfactory flame. The suspending wire must fit tightly, as, if it slips down, the apparatus will blow out or overflow. A very slight immersion of the carbide starts it."

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In the course of a *Homily on Lantern Slides*, recently delivered at the Camera Club, Mr. H. E. Davis said: "The first necessities for success in the making of lantern slides are great patience, great care, and exceptional cleanliness. It must be recognised that, in exhibiting a slide on the screen, we are practically putting our effect under the microscope, and any technical defects, however minute, will be much exaggerated. This applies not only to the defects on the film, but to roughness or displacement of mounts, bubble marks, scratches, finger marks, or other irregularities. The making of a slide approaching perfection is a thing not to be done with a light heart. Unfortunately, we have continuous evidence that some of our producers of slides are content with getting any print, so long as there is sufficient density to show in some shape on the screen. Such slides have apparently been put in the developer with no control exercised over the result, and without the operator having any notion of what the effect of the development will ultimately prove to be. This is not the way to make lantern transparencies, or anything else photographic. There is a general impression that slides made on collodio-bromide films are much superior to those on gelatine. I am not prepared to allow any great superiority; it is rather a question of patience. With a well-restrained developer a deposit quite equal to that on collodio-bromide can be obtained on gelatine. In proof of this, I hand round for your examination a few gelatine slides, in which you will observe that, by a proper method of development, the deposit on the film exactly resembles that of collodio-bromide. In any case, to give character and strength to a gelatine slide, restrained development is a necessity; the back of the slide should, by reflected light, show a deposit forming a clean silhouette of the picture. This will vary in colour from a pearly grey for black tones to an orange for rich purple ones.

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"I wish to call your attention to a point which is frequently neglected, that is, the use of the clearing bath. This is a necessity; it brightens the image when not veiled, and, if it is veiled, removes the dull or smoky appearance. It is always desirable to keep at least one small spot of clear glass on the transparency, so as to have as wide a range of gradation as possible. If the slide is slightly smoky, it is flattened and lowered in power and tone.

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"We often see strong cloud effects shown, in which the heavy clouds appear as though cut out of black paper with a bright edging of light—there is no such thing in nature. However dark and heavy a cloud is, it is always full of detail, and it depends on proper exposure and development of the negative and of the transparency to get this correctly. With regard to slides which are frequently shown full of defects, this, I am afraid, proceeds mostly from indolence of the maker, who *might* repeat his print with improvement. But it occasionally happens that the print for some reason cannot be repeated, or that the negative is defective, but still of considerable interest. Many defects can be repaired with care by retouching; with regard to single pinholes, it is best to touch them out, even if the repair shows on the screen; a dark spot is always less offensive than a bright one in the wrong place. I shall show you on the screen some slides very extensively repaired, where I think you will not observe the retouching till I point it out to you. I shall also show you a series all made with one developer, varying from black through brown to rich silky purple, to demonstrate that, with care and an intelligent use of exposure and development, an unlimited control can be exercised over the results. There is no mystery about this operation, any one can find the whole secret on a small bill contained within a shilling box of Thomas's lantern plates."

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The Birmingham Photographic Society's Tenth Annual Exhibition will be held at the Exchange Assembly-rooms, New-street, from Monday, May 6, to Saturday, May 11, inclusive. The following is the programme of lantern entertainments, commencing each evening at a quarter past eight and concluding about nine o'clock:—Monday, May 6, *In the South of Spain with a Camera*, by Mr. F. P. Cembrano (London). Tuesday, May 7, *A Photographic Ramble in Switzerland*, by Mr. Henry Sturmey (Coventry), Editor of *Photography*. Wednesday, May 8, *The Avon Valley, from Pershore to Tewkesbury*, by Mr. Harold Baker (Birmingham Photographic Society). Thursday, May 9, *Series of Photo-micrographic Slides*, by Mr. Fred. Iles (Birmingham Photographic Society). Friday, May 10, the lantern slides in competition for a silver medal, &c., in the open class, No. 7, will be exhibited and described by Messrs. W Jones and W. Bateman. Saturday, May 11, *Instantaneous Photography*, by Dr. Hall Edwards (Birmingham Photographic Society).

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Before the Cardiff Photographic Society, on Friday last, Mr. S. W. Allen exhibited his new Science Magazine Lantern, which caused a great deal of favourable comment. A reservoir, containing fifty or more slides, travels under the lantern proper, and by turning a handle the first slide is brought into position opposite the condenser, the next turn of the handle removing the exhibited slide and bringing another into its place. A sheet of celluloid is brought in front of the condenser whilst the slides are being changed, which gives a pleasant dissolving effect. The advantages of the system are obvious. The slides can be placed in position before commencing operations, the

risk of putting in a slide wrong side up, through improper labelling, &c., being reduced to a minimum, and, as each slide is returned into the groove in which it was originally placed, a particular lecture need never be interfered with, as the reservoir can be used as a storage box. To show that there is no risk of hitches, Mr. Allen passed fifty slides through the lantern in the short space of twenty seconds.

THE SEARCH LIGHT.

Those of my amateur readers who are now turning their attention from lantern matters and indoor photography generally to field-camera work will thank me for recommending them a good little book, which will prove very serviceable to them in suggestions for photographic tramps. This is *Half-holidays with the Camera*, by Mr. Bernard Alfieri. During the last two years I have been many times guided by the hints and information it contains, so that my recommendation of it is based upon practical experience. Mr. Alfieri, who is a clear and terse writer, as well as a photographer of consummate skill, takes, as it were, a map of the environs of London north of the river Thames, draws a sweeping curve from Burnham Beeches on the left to Manningtree on the right, and in the course of some twenty-three pleasantly written chapters indicates, rather than points out, the opportunities for camera work which may be availed of at the best-known spots within easy reach of the metropolis. The book, which has fifty illustrations, is published by Messrs. Whittingham & Co., 91, Gracechurch-street, E.C.

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It is partly to the credit of Mr. Alfieri that I passed what perhaps has been as pleasant an Easter camera jaunt as I have ever had. This was in Constable's country, which, to quote Mr. Alfieri, "lies up the Stour Valley, beginning at Manningtree . . . . a distance of ten miles, and comprising . . . . arable and pasture land, marsh and reed-grown dyke, upland and valley, together with the stretch of quiet river known as the Vale of Dedham." Although the trees were rather bare and bleak, I saw that in late spring and early autumn the neighbourhood of Dedham Bridge, Flatford, East Bergholt, to mention only a few of the principal places in the valley, abounded in fine material for picture-making. Anything I could further say in photographic praise of the Vale of Dedham might seem an echo of Mr. Alfieri's words, so I will wind up by advising those of my readers who want a few days' photographing in a delightfully drowsy and dreamy spot to provide themselves with Mr. Alfieri's book, read the last chapter, and do what it recommends.

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In the Vale of Dedham I believe that Colonel Gale, Mr. Lyonel Clark, Mr. T. M. Brownrigg, Mr. George Davison, Mr. B. Gay Wilkinson, and other prominent workers have taken numerous photographs that have rightly brought them fame. Now that I have "let the cat out of the bag," I suppose I shall be reproached with inciting a crowd of less capable aspirants to go and make Dedham Vale cheap and common. I do not think, however, that there is much likelihood of such an invasion, for Dedham is nearly sixty miles from London, and about four from a railway station; so that it is beyond the attack of those who are not prepared to devote a few days to their work, and consequently rather difficult to Bank-Holidayise. Six of us spent Easter at Dedham, and we—— But, ah! that is another story.

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To the Honorary Secretaries of the Stanley Bicycle Club (Photographic Section); South London Photographic Society; Ealing Photographic Society; Leytonstone Camera Club; Hackney Photographic Society; Woolwich Photographic Society; and others whom it may concern.—Gentlemen,—Last year you fixed the dates of your Societies' Photographic Exhibitions so closely together that only about a week included all six. This clashing, as I said shortly afterwards, weakened your open classes, and possibly your attendances, and rendered it impossible for the Press to notice the Exhibitions adequately. If you contemplate holding Exhibitions this year, would it not be wise of you to arrange among yourselves to have a little more time between the various dates, so that the disadvantages I have enumerated may not again be felt?

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The "L. and P." auction sale of members' apparatus was duly held on Thursday evening, April 25. About forty lots were disposed of, and many really good bargains were obtained. The affair passed off very successfully, and there were several humorous incidents which will probably not be recorded on the minutes. And that sale is not without its moral—namely, that an amateur photographer can always put his apparatus to a better and more profitable use than that of taking photographs with it—he can sell it.

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Are photographs of rapidly moving trains still popular with the general public? The other day I had occasion to "take a walk down Fleet-street," and noticed several of such photographs in a shop window, from which it is to be supposed that there is still a sale for them. A glance at the photographs instantly reminded me of an article I wrote in a popular magazine, just eleven years ago, in which, taking a survey of the then position of photography, I felt constrained to remark that "Flying Dutchman" photographs no longer aroused much interest. Few amateurs in possession of a quick shutter can resist the opportunity of "taking a train," and so common are the results that I should not have thought any room was left for exciting non-photographic interest in them. And yet possibly I am wrong, and the public taste for that kind of thing is not yet exhausted.

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I share the regret of the editor of a contemporary, that we have not in England an establishment like the Imperial Photographic High School of Vienna, presided over by Dr. Eder, where experimental and research work can be performed, and from which the results of investigation can be published. The trend of modern experimental work in photography is such that very few individuals have command of the necessary facilities for conducting any but the most elementary experiments; and thus it comes about, I suppose, that in three-colour printing, in half-tone block work, in Lippmann's colour process experiments, in lens construction, not to speak of several minor divisions of photography, we are indebted to our foreign and American *confrères* for the greater part of the recent advances that have been recorded.

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How often do we hear it said that there is very little left in photography to be done or discovered? A double fallacy underlies the observation. On the one hand, to claim finality for a young and progressive art is absurd; on the other hand, an intelligent view of the present position of photography must drive home the fact that, especially in the directions I have pointed out, we are, as it were, trembling on the verge of improvements and advances. Such being the case, it is to be deplored that all investigation and experimental work has to be left to private and individual expense; that we have to go abroad for so much of our knowledge; and that there exists little apparent probability of any assistance being obtained from Government in the establishment of a school or laboratory available for scientific work in photography.

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But I hope the Royal Photographic Society will keep the subject, which is one of cardinal importance to us as a nation, before it, and that the City Companies and the London County Council may be induced to lend financial support to any plan for placing London on a level with Berlin and Vienna.

* * * * *

The editor of the *Photographic Times* of New York does not endorse a recommendation to employ the eyes for obtaining a stereoscopic effect, on the ground that the unnatural strain upon the muscles of is likely in some cases to cause injury. My experience of this, the handiest, cheapest, and most effective form of stereoscope is that it works no discoverable injury to the eyes, and I strongly recommend all stereographers to endeavour to acquire this useful art of "seeing double." A simple method of doing so is given by the editor of the

ALMANAC in the volume for 1887. I should like, however, to hear the views of an oculist on the subject.

* * * * *

REVERTING to stereoscopic matters, it is remarkable to notice how long-lived are certain fallacies which one would have thought were exploded long ago. I have in mind a brief article in the *Bulletin Belge* by M. F. Drouin, in which, while pointing out that a non-reversed stereoscopic image can be obtained by the displacement of the lens on the camera front, he inclines the camera itself at each exposure instead of keeping it "square." Theoretically I suggest that this should lead to the production of a result in which the parallelism of the lines of the two views was not preserved, as pointed out in the JOURNAL, and in his *Manual* years ago by Mr. Chadwick, in the case of the displacement and convergence of the camera itself.

* * * * *

Apropos of the recent discussion regarding photographic sizes, here are some remarks by Mr. John Carbutt, which will be interesting as giving an idea of how the matter is regarded in America. Speaking as a dry-plate manufacturer, he said that he would welcome any system which would simplify the matter of sizes. The present series of sizes were those which have been in use from the first, and some of them certainly have no reason for their being. One size which is still kept on the makers' lists, though rarely called for, and which he would be glad to see dispensed with, is the so-called "half size"—$4\frac{1}{2} \times 5\frac{1}{2}$—which isn't really the "half" of anything in use. The "quarter size"—$4\frac{1}{4} \times 3\frac{1}{4}$—was another size which could easily be dispensed with, 4×5 being as small as need be used, and being besides the half of a 5×8 and the quarter of an 8×10 plate. Mr. Carbutt spoke also of the inconvenience suffered by American and English photographers when compelled to use the European sizes, which are measured by the metric system. The 5×7 inch came very near the 13×18 c.m., so near in fact that those two sizes were practically interchangeable.

* * * * *

THE frequently made suggestion that at our courts of justice there should be a lantern installation, so that the jury might have the opportunity of inspecting projected enlargements of copies of documents or other objects upon which disputes may turn, was recently adopted by permission of Lord Chief Justice Russell. In the course of a case that was tried before him last week, in which a question was raised as to whether a signature on a copy of an alleged original document had not been obtained by cutting out the signature from another document, placing it in contact with a third paper, and taking a pressed copy of the whole, evidence was given by "photographic experts" bearing out this theory. These gentlemen alleged that they could detect a rectangular impression round the signature. Apparently, neither Judge nor jury could see the marking so distinctly, and counsel thereupon asked permission for the jury to visit an adjoining court to see slides made from the photographs of the documents in question. By the use of a lantern these slides would be thrown upon a screen, and experts thought they could point out the rectangular lines more clearly. The Lord Chief Justice, however, said he could not have any pointing out in his absence; and a juryman asked if they could see the slides without having matters pointed out to them, and the learned Judge assented, observing that he would himself see the slides at another time.

RADIANT.

LANTERN MEMS.

THE photometric value of powerful lights has always been a problem difficult of solution, and, owing to the want of a unit as an absolute standard for comparison, it is now still in an uncertain state, although several scientific men have expended considerable time and thought in devising apparatus and lights with a view to overcome the difficulties.

* * * * *

AT the Lantern Society, on April 8 and 22, an attempt was made, in a rough-and-ready way, to show the power of various illuminants used for lantern projection, and, although interesting as a visual comparison, was of very little value, I think, for actual candle power, the difficulty of preserving a standard candle power being intensified by a candle being burnt in an open room, and consequently liable to guttering and uneven consumption.

* * * * *

A BUNSEN oil-spot arrangement was used at twenty-two feet from the lantern, and a candle placed behind it and drawn backwards or pushed forward until, when viewed by the audience from either side of the projected rays, the disc was of fairly equal colour. An opaque diaphragm was inserted in the stage of the lantern, so as to only allow sufficient area of light to be projected to cover the oiled-spot screen, and not permit of a great amount of light being reflected back on the same from any light object behind. Each light was tried inside the lantern and also outside as a naked light.

* * * * *

THE distances between the candle and oil-spot screen varied from $3\frac{3}{8}$ inches with the best mixed gas jet to over three feet with a four-wick oil lamp when the lights were inside the lantern, and for the naked lights from $8\frac{1}{2}$ inches with the mixed gas jet to four feet and over with the incandescent gas and four-wick oil lamps.

* * * * *

THE announcement of the candle powers calculated from these particulars created a little mirth, from the fact of the mixed gas jet being put at over 5000 candle power in the lantern, while the two oil lamps and an incandescent gas light were given from 112 to 62 candle power, and outside the lantern the lime was stated to be 964 candle power, and the other three mentioned were given as 28, 38, and 30 candle power. The oxycalcium spirit jet was given as 29·7 outside, and 74 candle power inside lantern; the blow-through lime-light jet with oxygen from cylinder, 108 candle power outside; and with house gas from supply, outside, 157 candle power, and inside lantern, 630 candle power.

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To show the immense superiority of mixing boxes of proper construction with mixed gas limelight jets when used with compressed gases and automatic regulators, it may be mentioned that, in two ordinary commercial jets tried, the result in one case gave only 100 candle power naked and 296 inside lantern, and the other 272 candle power outside and 1530 candle power inside, by the same method of calculation as the best one, referred to above; in other words, one-ninth and one-third the power respectively of the light was produced by the jet made in accordance with modern ideas that the gas should be well mixed up before issuing from the nozzle.

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THE subject of candle power of lights of great intensity has been a matter of interest to me, having at various times co-operated with scientific men to try and arrive at something definite, and, thinking I may have recorded something, I turned to my back numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY, and found a short article on *The Photometric Values of Powerful Light*, which appeared on March 9, 1888. After referring to the difficulties of getting a standard light and keeping a sixteen-candle gas burner at a normal height and illumination, and the length of scale being insufficient in ordinarily constructed photometers to arrive at a result, also the difficulties in employing a higher standard, viz., a fifty-candle gas burner, I say, "The conclusions arrived at were as follows:—(1) The difficulty of getting a standard unit and preserving it; (2) the difference in colour of light between candle and gas and the limelight; (3) to consider the best form of unit having at least 100 standard candle power, or to determine on an alternative arrangement."

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SINCE then further experiments were made with an amyl-acetate Siemens' Standard lamp of one normal candle power, and an incandescent electric lamp constantly standardised with it, also with

diffusion photometers, and other appliances; and I hope shortly to be permitted to publish the results of these tests, together with an account of one of the recent methods of ascertaining candle power of powerful lights, and a description of a modern laboratory where such tests are conducted. Incidentally, I may remark that the result arrived at in 1888, when using the ordinary Bunsen's photometer and comparing a best (at that time) mixed gas jet with a fifty candle-power gas burner as a unit, was that the light produced gave a candle power as a naked light of 350 candle power, and in the lantern 2250 candle power, but it varied with different forms and sizes of objectives used for the lantern.

* * * * *

THE scare created by the sad explosion of the gas cylinder at Fenchurch-street will no doubt soon pass away when users of oxygen have read, marked, and learned Dr. Dupré's report, and the public will be re-assured on learning that all compressers adopt the stringent precautions that Brin's Company inaugurated, and which prevent any wrong gas being pumped into a cylinder, or a cylinder being in use that has not been certified as being properly annealed, and also tested not only to a definite pressure, but also that it has not shown any permanent stretch.

* * * * *

THE electric light for use in optical lanterns is daily being more sought after, and as all users have not the advantage of a direct-current supply, which is the best when obtainable for arc lights for projection purposes, yet the alternating current can be utilised to distinct advantage if a hand-fed lamp is employed, and the arc kept short so as to secure the minimum amount of humming and the smallest variation of the light eccentrically. In fact, if fair-size front lenses are used for the optical lantern and a rather larger amount of current than would be necessary with a direct supply, not only can a steady light be obtained, but a very fine one, that requires no more attention than that given to the turning of a lime in a lime-light.

G. R. BAKER.

GAS CYLINDERS.

BOARD OF TRADE REGULATIONS.

THERE seems to be an impression amongst some users of oxygen that I am opposed to compressed gas in cylinders. They make a very great mistake, which can only be accounted for by either not reading carefully all I have said on the subject, or else not remembering what has been said. If the system of compressed gas in cylinders was put on a proper basis, there would be very few more in favour of it than myself; but, up to the present time, we have had plenty of evidence that the system is *not* on a proper basis, and all that can be truly said to the credit of it is, extreme portability; at the same time much could be said on the debit side.

Mr. Gerard Smith, in your issue of March 29, states that all the fatal accidents with gas cylinders have been by those charged with oxygen derived from chlorate of potassium, and he attempts a possible explanation by suggesting that the chlorine which passes over with the oxygen may have something to do with the cause of the explosions. Now, as a matter of fact, the Fenchurch-street accident is the first fatal one in England caused by a cylinder charged with oxygen derived from chlorate of potash; all the others have been by cylinders charged with oxygen by the Brin process.

Mr. Wm. Bishop, in your issue of April 12, can only recollect three fatal accidents with gas cylinders, and mentions the first in Dublin, the next in Bradford, and the last at Fenchurch-street. But he has forgotten the Glasgow fatal accident, where the foreman of the Scotch and Irish Oxygen Company was "blown to pieces."

Mr. Bishop completes his list by reference to the accident which nearly deprived the world of the future services of Mr. Bridge. But, says Mr. Bishop, this was not a cylinder accident—it was only a pressure gauge that "went off."

Now, most people will admit that the pressure gauge is practically part of the cylinder when in use; at any rate, the cylinder system is responsible for what took place. Mr. Bishop has also omitted to mention the accident to Mr. Dyson, by which that gentleman was deprived of the use of one eye. Then, what about all the other accidents with cylinders and their connexions, which luckily have not been attended with fatal results, though with hairbreadth escapes? And what about the American accidents, fatal and otherwise, by the use of English cylinders and the high-pressure system?

I have no desire to rake up a lot of things against cylinders; on the contrary, I would like to say something in their favour, but it is no use glossing over things which we know to be wrong.

I have nothing to say at present about any individual, firm, or company manufacturing cylinders or supplying compressed gas; but we have heard, from time to time, a good deal about certain strict regulations said to be observed in connexion with the supply of compressed gas, and ample proof could be produced that the statements are unreliable; in fact, that the "regulations" are not carried out.

At the various inquiries after each fatal accident, something had to be said by somebody. The Dublin disaster was said to have been caused by the user of the cylinder deliberately mixing oxygen and hydrogen in one cylinder, and then applying a light. The evidence was not very strong on the point, though, no doubt, the cause was established.

The Glasgow accident occurred—nobody knows how, though it was said to be a cylinder charged with mixed gas in the Company's own premises.

The Bradford accident was considered to be accounted for by the cylinder being made of unsuitable material, though it had stood the usual tests before being charged. Admitting the steel was not the most suitable, would that alone account for the accident on falling from a lad's shoulder? Opinions differ on this point.

Cylinders made from other material have been charged and then dropped from considerable heights without exploding, and it would have been interesting to have had recorded similar experiments on a cylinder made from the same material as the Bradford one. But what about the cylinders that have exploded without being dropped at all, and which might be said to have "gone off" spontaneously?

It has been recommended that all cylinders should be annealed after testing, and that retesting and reannealing should be periodical; but, if the steel is wrong to begin with, will the annealing put it right? If not, there must be hundreds in use to-day that are wrong, and therefore unsafe. If, on the other hand, annealing *will* give the required tensile strength to unsuitable steel, it must reduce the tensile strength of steel which is already right before annealing, and, as another matter of fact, this is just what annealing does.

The Fenchurch-street accident occurred to a cylinder which is said to have been made of most suitable steel, and it has been presumed or suggested that, at the time of the accident, it was charged with mixed oxygen and coal gas. The inside surface showed signs of heat—*great heat*, we are given to understand—and mixed gas in contact with oil or iron filings is suggested as the cause for what took place.

Now, if we sum up all that has occurred, and all that has been said at the various inquiries, we do not find that much has been established, and we are left very much as we were.

It is well known that, under a pressure of oxygen, iron may be ignited, fused, melted (without the application of a light or the presence of hydrogen); but what the most favourable conditions for combustion are may not be properly understood, though it is reasonable to assume that the higher the pressure the sooner the conditions are attained in a cylinder containing oxygen at a pressure of 120 atmospheres, iron filings, a burr, or slight projection about the neck of the cylinder, or even some little irregularities on the inside surface of the metal, might be sufficient in one circumstance and not in another; for instance, it might require a slight disturbance in one case and a greater shock in another to start the combustion, but when once the combustion had commenced it would be very rapid in its action, great heat would be generated, and the expansion of gas or increase of pressure would be the immediate result.

The expansion of nearly all gases is uniform for every degree of increase in temperature, to the extent of $\frac{1}{273}$ part of their volume from 0° Cent., so that one volume of gas at 0° Cent. would expand to 1·0366 at 10° Cent. (50° Fahr.), which would probably be about the normal temperature of a gas cylinder at a railway station. If the temperature be raised to 334° Cent.—the melting point of lead—the expansion would equal 2·22 volumes, or more than twice the normal pressure; but the melting point of steel is about 1300° Cent., and at this temperature one volume of gas would expand to 5·76 volumes, or an increase of about five and a half times the normal pressure in a cylinder.

Now, it will be seen that if the combustion of any particles of iron did take place in the cylinder, it would not have to proceed very long before the limit of the strongest gas cylinder must be reached, and an explosion the result, and all this might not occupy, from start to

finish, a second of time—certainly not long enough to make the outside of the cylinder even warm. The explosion having taken place, and the supporter of combustion *gone*, there might not be left any strong indications of the initial cause; in other words, the burst cylinder would not exhibit any glaring signs of fusion, because the process had not time to proceed far enough.

Now, in most of the cylinders that have exploded, signs of fusion have been found, and I think my readers will admit that the whole system requires most serious consideration.

For the past two or three years I have advocated in these columns Government inspection and supervision and Government testing of the cylinders, but I have expressed great doubts about the Board of Trade taking the matter in hand.

The Board of Trade would not have anything to do with steam boilers *on land* (it is quite different with steam boilers at sea), and so steam boiler insurance companies and steam users' associations were established. These Companies not only insure boilers, but they keep qualified engineers to see that the boilers are made of the suitable material, and to test them and the fittings, and supervise the working, &c., and it must be said with very great success.

Then, presuming that the Board of Trade will not entertain the supervision and testing of gas cylinders, why not some insurance company take the matter in hand?—or it might be worthy of the attention of a new company. Qualified men would be employed, first to test the system and then the cylinders. The insurance would, of course, be for a limited amount and for a limited period, and would on the expiration of the period—say two years—have to be renewed. Perhaps the cylinders might require retesting or reannealing, &c., and if the gas compression companies could be induced to charge only insured cylinders, all the better; and, providing the gas companies could be further induced to work under the inspection of the insurance companies, so much the better still. If a responsible insurance company, after thorough investigation, did take the matter in hand, the public would be satisfied; if, on the other hand, after investigation, they would not entertain it, the public would know it, and there might be some satisfaction even in that. Of course, I have not gone into any financial considerations, but it seems to me that such an insurance might be worked on similar lines to the steam boiler insurance companies, if not under the present rules or system, then under some modifications.

W. I. CHADWICK.

DAVENPORT'S COMBINED CURTAIN SLIDE AND PANORAMIC CARRIER.

ONE of the most important aids to the success of a lantern exhibition is a simple and efficient means of changing the slides. The numerous forms of carriers that are from time to time brought forward are evidence of this fact, and among the latest additions to this portion of a lanternist's outfit is an improved form of curtain slide carrier recently designed by Mr. G. Davenport, of the Society of Arts. The essential idea of this carrier is to produce on the screen the effect of a curtain descending to obscure the picture on exhibition and rising again to disclose a fresh view, the change of slides taking place at the moment of the screen being obscured. Some time ago Mr. Davenport introduced a form of carrier for producing this effect, which, however, required to be fixed vertically in the lantern stage and the lantern itself required certain alterations for this purpose. In the improved carrier illustrated below, these difficulties have been overcome, and the present apparatus works horizontally, and will go into any ordinary lantern front.

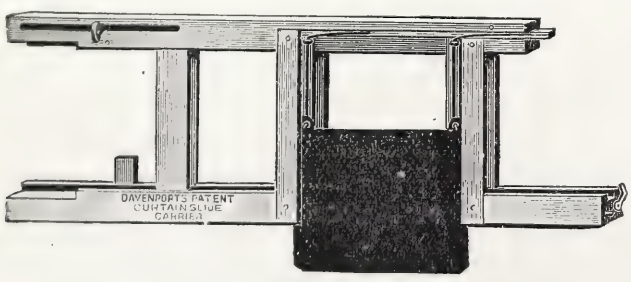


FIG. 1.

This curtain effect is a natural and pleasing one, and is preferred by many to the ordinary dissolving arrangement which requires two lanterns, whilst with the above carrier a single lantern only is necessary. The curtain effect prevents any movement of the slides being seen during changing, and, if properly worked, has also the advantage of relieving the eye from the constant glare of the screen, which causes so many lantern entertainments to become fatiguing to the spectators, whilst the momentary rest thus obtained enables the succeeding pictures to appear brighter and more effective than they otherwise would.

The carrier employed is a panoramic or "push through" form, and will fit any ordinary lantern. It is made of such length that it will hold four slides of English standard size ($3\frac{1}{4} \times 3\frac{1}{4}$) at the same time, and is provided with stops and guides for centering the slides. A stop is also fitted for quarter-plate (American and Colonial slides). A movable catch is fixed to the end of the carrier which acts as a lock and prevents the fourth slide from being pushed along until the first slide, already exhibited, has been removed. Accidents from falling and broken slides are thus prevented. In the upper part of the carrier is cut a groove in which a rod or runner works to and fro. To this rod is attached by cords a curtain running vertically in guides on each side of the opening facing the condenser, and so arranged that when the rod is pushed along, the curtain is raised so as to cover the space opposite the condenser, producing on the

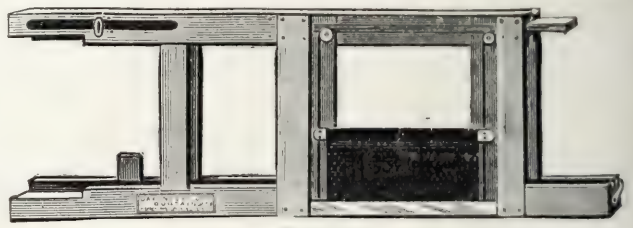


FIG. 2.

screen the effect of a falling curtain. On withdrawing the rod, the curtain falls and shows on the screen as a rising curtain. Between the falling and the rising of the curtain the slides are pushed along by hand, guided by the stops, in the usual manner. The working is very smooth and may be fast or slow at will. An important point is that the movement for working the curtain effect is independent of that for changing the slides, so that the carrier can be used as an ordinary panoramic carrier without the curtain effect when desired. This enables the operator to vary the form and relieve the monotony of an exhibition from time to time.

The carrier is made in two patterns, of which fig. 1 represents a simple form suitable for lanterns having open stages. The curtain in this carrier consists of a metal disc which falls by its own weight when the runner is withdrawn, and a clear depth of about two inches is necessary below the stage to allow the curtain to fall.

For lanterns in which the stages are closed, or otherwise constructed, the modified form shown in fig. 2 has been designed, in which the curtain rolls up in the base of the carrier and is unwound and wound up in a manner somewhat similar to that of a roller blind. The movement for actuating the curtain is similar to that already described, and the carrier is in all other respects the same.

MODERN LANTERN-SLIDE METHODS.

[Photographic Society of Philadelphia.]

THERE are two ways of making lantern slides with gelatine plates, namely, by contact and reduction in the camera, and many consider the latter method as securing the best result. For my part, given a good negative, I find no difference in the result, whether it be by contact or reduction. When the image on the negative is of right proportions for use by contact, it is by far the more expeditious method, as the whole work can be done in the dark room. The views I shall show you are from both glass and film negatives, mostly reductions from 5×7 plates and films. The first ten slides are from negatives by Dr. Edw. H. Williams, a member of our Society, and the last ten by Mr. W. D. Fairchild, of New York, all films. In the developing of the slides, eikocum-hydro. and ferrous-citro-oxalate, by the formulas I publish, were used. The views from Dr. Williams's negatives are mostly studies of forestry in Southern California taken on ortho. 23 plates and films. I call your attention to the slides Nos. 8, 9, and 10 as showing the value of backed plates to prevent halation. Nos. 11, 12, and 13 are from an Eclipse film negative by my son, taken in the ostrich farm at the World's Fair. No. 11 is on a gelatino-albumen plate, 12 and 13 on gelatino-chloride, developer, ferrous-oxalate; the difference in the tone from brown to reddish tone is effected by an increase of exposure, restraining with bromide. Slides 14 and 15 are from same negative by contact, the sky very much scratched by daily use in the factory in testing lantern plates. To remove the defects in the sky is a very simple operation; this negative requires an exposure of 25 seconds at 4 feet from a 16-candle power Edison lamp; during the exposure the sky is partly shaded with the fingers closed together, moving the hand slightly. After developing and fixing, the slide is merely passed through or dipped in water to remove the hypo solution from the surface, without any attempt at washing; then, holding the sky part downwards, dip a tuft of absorbent cotton in a one per cent. solution of red prussiate of potash; commence at lower edge and carefully work over the surface of the sky and around the building and trees, then rapidly pass the cotton over the entire surface of the slide; quickly immerse in water to stop the action, and wash thoroughly.

Where the negative possesses a clean, even sky, do not clean it off; a clean even tint to the sky is far better than clear glass. 18 and 19 are views on Mill Creek, the first on ortho. 25 film, ferrous-oxalate developer; 19 on ortho. 25 non-halation plate, eiko.-cum-hydro. developer; No. 20, Darby Creek, ortho. 25 non-halation plate, ferrous-oxalate developer; No. 21, from same negative, eiko.-cum-hydro. developer; Nos. 23 to 29 are all developed with eiko.-cum-hydro. developer without any "dodging." Nos. 30 and 31 will illustrate what can be done in developing to secure full values in the negative. The subject is the United States cruiser *Columbia*, from an 8 × 10 negative, by our President, Mr. Burroughs. The clouds in the negative are of greater intensity than the highest light on the cruiser, and by continuing the development until the clouds were well defined the body of the vessel and the water would be too dark; therefore to stop development when the vessel and water were sufficiently brought out would leave the sky blank, as shown in 30; but, if after washing off the developer you pass over the vessel and water a tuft of cotton wet with a 10 per cent. solution of potassium bromide, then with another tuft dipped in the developer, you carefully work over the sky, the clouds will develop and produce the harmonious result as shown in slide No. 31. The same treatment is applicable to views of waterfalls, which are usually surrounded with dark green foliage, as in slides 26, and 29 previously shown, Bridal Veil and Factory Falls, Pike County. When the surroundings were fully developed the slides were washed, then the end of my finger was dipped in the developer (eiko-cum-hydro.) and passed lightly over the water part of the view, when detail not before visible made its appearance. The same treatment was adopted in the view (negative by Mr. Pancoast) containing a light-coloured stone clock tower, which brought out all the detail of the stonework and face of clock. Slides 35 to 39 are shown to represent views made on gelatine plates in 1879 and 1880. The reception to General Grant on his return from a tour around the world will locate the time. Slides 40 to 49 are all from film negatives by Mr. Fairchild, and fairly represent results of several hundred negatives obtained by him in different countries he visited. No. 50, and the last view, is to illustrate the producing of unity in foreground, and sky with clouds. This negative was made on a 23 ortho. film with colour screen, *f*-22 stop, two seconds' exposure, made several years since. When the clouds were fully developed I stopped development, and fixed. The result was that the foreground was under-developed. What I should have done, and what I thought of after it was too late, was to have continued development of the foreground, as in the case of the clouds when making slide of the cruiser. Now, in making the slide now on the screen, I stopped developing the foreground when sufficiently out by applying a ten per cent. solution of bromide, holding the foreground of the slide downwards. The developer in the body of the film continued its work and brought out the clouds, giving the result now before you. All of the slides shown are varnished with Roxyline enamel, a practice I invariably follow in slide-making. Before closing my remarks I wish to call your attention to an aid in securing a sharp focus of the image when reducing in the camera. I first get the size of reduction desired and an approximate sharp focus; it is here that at times it is very difficult to decide on the sharpness of the focus. To render this easy of accomplishment I remove the negative and replace it with a positive of a line subject, such as I have here, which happens to be a map of the streets of New York, placing the film side towards your lens; you can make with ease and accuracy a sharp focus, then replace your negative and make your exposure.

JOHN CARBUTT.

ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES.

[Society of Amateur Photographers of New York.]

THE scanty light of our short winter days, and the uncertain conditions of the sky and atmosphere in many more of the months which constitute our year, all tend to embarrass photographers in many an annoying and much distracting way, entailing, as it does, at the same time, broken promises, ill temper, and pecuniary loss.

Hence the ever-progressive mind of man early began the search for a substitute, generated by artificial means, for daylight, one which would enable the photographer to work at any hour of the day, independent of darkness, cloud, or fog, combining economy with comfort to the sitter, and regularity of results, by bringing the lighting and exposure under absolute control.

Therefore, to trace in as concise a way as practicable the different paths of research, the various substances and means employed, and by whom recommended, if possible, and the varied successes resulting from the different investigations and processes pursued by scores of earnest men, will be the purpose of this paper.

I am fully aware that this is not an easy task that has been designated by the Committee in pursuance of its scheme of investigation for the best possible artificial light for photographic portraiture. So much chaff and worthless matter has to be sifted from the pure grain, so many claims for priority have to be looked into and decided if possible, dates settled, and erroneous statements corrected, that the further one goes into the question its magnitude seems to increase by a double geometrical progression; but, as I have undertaken the task, and, it must be confessed at the same time, with considerable trepidation, I shall endeavour to complete the subject to the best of my ability, and crave your kind indulgence for any failure or omissions that may occur.

It seems to me best, in attempting the history of the various kinds of artificial lights that have been used, and the substances employed in its production from time to time, in order to avoid confusion, to arrange each class by itself, and continue the description of that class down to as near the present day as possible, or to the time of disuse, noting the various modifications and improvements before beginning another.

The Oxyhydrogen Light (*Drummond Light*).—This light was originally used for signalling purposes by Lieutenant (afterwards Captain) Drummond (hence the name of the light) about 1830. It consists of passing a jet of oxygen through a flame of hydrogen which is made to impinge on a disc or cylinder of lime, when the lime is rapidly brought to an incandescent state, and a very bright light is produced. One of the earliest adaptations of the limelight was for the exhibition of microscopical objects by projection on to a disc or screen, and, when used in the magic or optical lantern, it became a valuable means of illustrating lectures. The introduction of photography added greatly to the popularity of the lantern, and this has steadily increased up to the present time.

The preparation of oxygen is but a simple matter, but at the same time care is required. The black oxide of manganese must be pure, the gas evolved should be washed, and all atmospheric air forced out of the indiarubber bag or steel cylinder before the oxygen is admitted. Hydrogen being troublesome to make, it was discovered that common coal gas proved a good substitute, and it is now generally used in producing the lime light. The first notice of the use of this light for portraiture that I have been able to find appears in the *Photographic Art Journal*, March, 1852—a notice of these Daguerreotypes taken at night by aid of the Drummond light by Mr. Whipple, of Boston, Massachusetts: "They are very good, much better than many daylight pictures. The outlines are very strong and dark, giving great boldness, but they are wanting in softness, tone, and expression."

The Oxycalcium Light.—An excellent light is produced when oxygen is blown through a flame of spirits of wine (alcohol) upon the lime disc or cylinder, and this was proposed as a substitute for the oxyhydrogen light.

The Ethoxolime Light.—The vapours of ether, when mixed with oxygen, give a very good light. When it was first proposed to substitute ether for hydrogen from coal gas I do not know. It was demonstrated before this Society about 1885 or 1886; but, on account of the dangers incurred by it in the hands of inexperienced persons, it never became very popular, though various plans, saturators, &c., have been proposed by which danger is said to be minimised. It is very difficult to estimate the intensity of very bright light; the human eye alone cannot do it, and therefore a comparison with a standard light becomes necessary. Various lights have been suggested—lamps burning highly volatilised liquids have been invented—only to meet serious objections. The amyl-acetate lamp was adopted in a congress at Paris some years ago. The light from a spermaceti candle, burning two grains per minute—one of the earliest suggested—is generally adopted, hence the term candle power. With this light the flame of an Argand burner can be adjusted, and against this the more intense limelight can be tested.

Determinations made in this manner give from 250 to 800 candles as the value of the light from incandescent lime. The great differences here given arise from the kind of burner used, the size of the aperture through which the oxygen is passed, and the degree of pressure. The kind and form of lime used will also affect the intensity and quality of light.

Bengal Light and other Firework Compounds.—I have been unable to find the exact date when these compounds were first used in photography or for photographic purposes; but, as a patent was granted John Moule, England, February 18, 1857, on an apparatus for burning pyrotechnic compositions for illumination, and called Moule's Photogene, they must have been in use some years before. "G. M." says in THE BRITISH JOURNAL OF PHOTOGRAPHY, 1887, that as far back as 1861 there flourished in the immediate neighbourhood of Covent Garden, London, a studio where it was announced that photographic portraits were taken every night by electrical light—twenty years before Van der Weyde. ("G. M." must have referred to this process as having existed previous to 1857.) "This was not true; they made pictures by the use of Moule's photographic lamp—probably the first commercially used light for photography. All the firework burning lamps sprang from this one."

The powder used was composed as follows:—

Pure and well-dried nitrate of potash	3000 parts.
Flour of sulphur	1000 ,,
Pd. sulphuret of antimony	200 ,,
Pd. red orpiment	400 ,,

Well mixed and passed through a sieve.

Bengal Light.—A species of fireworks originally used for signalling at night or otherwise, producing a steady, vivid, white or blue light, according to its ingredients.

The following formulæ of ingredients were amongst those most usually used.

1. Saltpetre, sulphur, black sulphide of antimony.
2. Nitre, mealed powder, sulphur.
3. Sulphur, mealed powder, antimony, lamp-black.

How long these fireworks were used generally is not stated in any of the journals, but that they had gone out of use is shown by the following. *Vogel's Progress in Photography*, American edition, 1883, noticing a lamp called the Luxograph, says: "In place of the costly magnesium wire, an attempt has been made to reintroduce Bengal white fire. It is burned in a blue glazed lantern with chimney, the whole standing in the focus of a concave reflector of above four and a half feet in diameter. The reflector is above the head of the operator and directed downwards towards the sitter. It consists of a large number of small bits of looking-glass set together like mosaic, the mouth or opening is covered with fine tissue paper to moderate the light which would otherwise be too crude. Gelatine plates, extra rapid, are used. Focussing is effected by means of a row of gas jets arranged over the reflector. About eight seconds is the usual time for gelatine plates. The whole affair is simple and portable." Alder, the inventor, has had frequent orders to take the apparatus to halls where large masked balls are given as late as July or August, 1884. Dr. Struenberg, in an article on artificial light for photographers' use, recommends for that purpose two pyrotechnic mixtures:—

No. 1.	Nitrate of potash	112 parts.
	Flour of sulphur	42 ,,
	Sulphuret of antimony	12 ,,

No. 2.	Nitrate of potash	6 pounds,	9¼ ounces.
	Flour of sulphur	2 ,,	3¼ ,,
	Sulphuret of antimony	6 ,,	3 drachms, 20 grains.
	Auropigmentum ($As. S^3$)	6 ,,	40 ,,

No 1 furnishes a perfectly white light, that of No. 2 has a bluish tinge and more actinic power; it may, however, be objected to because of the large amount of arsenic it contains. Dr. S. says: "The manner of illuminating with either of these is practical with our present rapid way of working, and even adapted to portraiture when proper reflectors are used."

There are many objections, and serious ones too, encountered in the use of these firework compounds. First, the difficulty and uncertainty in obtaining prompt and complete ignition, in many cases arising either from imperfect mixing, dampness, or impurities in the components. Second, the smoke and odours of the burning mass, not entirely dissipated even with the long chimneys and good draught that were employed for the purpose of carrying them off; and, finally, the danger arising from inhalation of the deleterious fumes from some of the poisonous ingredients employed in the compound.

It was also recommended to combine powdered magnesium with firework compounds to increase the intensity of the light—Gädicke and Miller and others—but the poisonous nature of many of these compounds and the serious accidents that occasionally occurred, both in their preparation and in their employment, soon called for their disuse.

The Magnesium Light.—In 1808, Sir Humphrey Davy demonstrated, by decomposing earths and alkalies, their metal bases, amongst which a little later magnesium was discovered. It remained but still little more than a laboratory curiosity until 1859, when Bunsen, of Heidelberg, and Doctor, afterwards Sir H. E. Roscoe, of Manchester, England, pointed out the value of magnesium as a source of light for photographic purposes. In 1862, Mr. Edward Sonstadt took out his first patent for improvement in the manufacture of the metal magnesium. In 1863 the manufacture of magnesium was commenced in Manchester, England, by a company formed for that purpose. As at this time no other use for the metal was known than that of a means for producing a brilliant light, it became a question as to how to utilise it. The wire form was found most convenient.

In one of the Manchester papers, about the end of 1863 or beginning of 1864, the following appeared: "Interesting Photo-chemical Discoveries. At a recent meeting of the Manchester Literary and Philosophical Society, Professor Roscoe exhibited the light emitted by burning a portion of a fine specimen of pure magnesium wire, 1 mm. in diameter and 10 feet long, which had been manufactured by Mr. Edward Sonstadt." Mr. A. Brothers demonstrated shortly after this occurrence the value of this new source of light for photographic purposes. He hammered into a thin sheet a small lump of the metal given him at the occasion related above, and with strips cut from this sheet made a good copy of an engraving in a darkened room in fifty seconds. Early in 1864, a stereoscopic picture of Blue John Mine, in Derbyshire, was made. In May of the same year, the portrait of Dr. Faraday was taken at the Royal Institution in London. In 1865, Professor Piazzi Smyth obtained some good portraits of the chamber in the interior of the great Pyramid.

In 1866–7 Dr. Edward L. Wilson, editor of the *Philadelphia Photographer* and *Mosaics*, described in both publications, and also demonstrated, the method of photographic portraiture with magnesium.

In 1867 or 1868 in this country, and in 1869 in England, Mr. George K. Proctor, of Salem, Massachusetts, obtained patents for photography at night with the aid of magnesium in a specially prepared room or apartment. It may be interesting to give a description of this invention and his claims, as set forth in his application for the patent. He says: "It consists in constructing a room for photographic purposes of such a form that the rays of magnesium light placed within will be reflected and concentrated upon the person or object to be photographed, so that photographing may be successfully performed at night by artificial light or other than that of the sun. The room or apartment is of oval form and elongated, so as to have an internal curved surface, which will reflect the rays of light from a lamp or other luminary in proper place upon the subject. It is made of oak wood, bent into a proper shape, and covered with paper cloth, which, by large eyelets in the edges, is hung on hooks inside the bows. It stands about six feet high, five feet wide, six and a half feet long, and weighs about thirty-five pounds. An opening is made in the covered end of the room or apartment for the end of the camera (which is adjusted by the operator outside) to pass through, and the other end of the room or apartment is open to admit of the ordinary background for the picture to be placed in proper position relatively with the person or object to be photographed." The *Philadelphia Photographer*, February, 1869, reproduces a diagram, showing the position of the whole apparatus needed in operating at night in working position.

Mr. Proctor used a kerosene lamp for focussing, and feeds the magnesium for lighting the subject by means of a clockwork lamp. To this lamp an indicator was attached, which might be set at the discretion of the operator to indicate when the time necessary for an exposure had expired. Mr. Proctor tersely set forth the following claims, after describing in full his invention:—

1. For photographic purposes, an apartment or room having its interior of such form as to reflect or concentrate the rays from a lamp or burner upon the person or object to be photographed, substantially as set forth.

2. The opening in the room or apartment for the purpose of allowing the camera outside of the room or apartment to be properly adjusted with regard to the person or object to be photographed within the room or apartment.

3. The employment of magnesium for illuminating purposes in connexion with a room or apartment, constructed in the manner or form substantially the same as herein set forth. JOHN H. JANEWAY.

(To be continued.)

A STEREOSCOPIC TRANSMITTER.

Theodore Brown, Portland House, Fisherton, Salisbury.

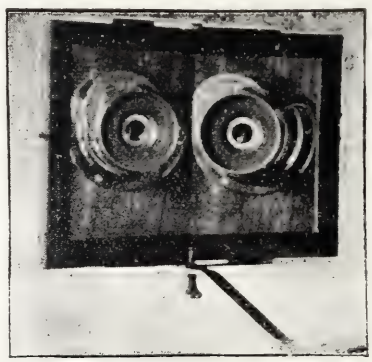


Fig. 1.

THIS is a device enabling two dissimilar or stereoscopic views to be obtained at one exposure in a fixed monocular camera. It consists of two plane mirrors inclined to one another, and fixed in small frames, and attached by a support to the camera base board, the mirrors being set obliquely to the lens. The view parallel to the mirrors is transmitted in duplicate through the lens to the sensitive plate, the transposition of the "left" and "right" being also effected. The illustrations explain the rationale of the plan. Fig. 1. represents an elevation of the apparatus, showing the double reflection of the lens of the ordinary camera.

In Fig. 2, A is the ordinary single lens camera; B, the reflected twin lens camera, produced by the transmitter C, the dotted lines showing the way in which the two views are conveyed through the transmitter to the lenses of the reflected camera B, and from thence to the lens of the ordinary camera A. Of course, as the images are transposed in the camera, the necessity for cutting the prints is obviated. We have not had an opportunity of putting the system to practical use, but a specimen print shows it to be effective.

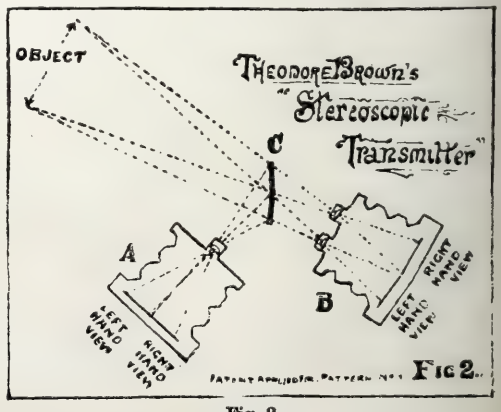


Fig. 2.

Lantern Query.

ENCELADUS.—You omitted your name and address—accidentally?

MONTHLY SUPPLEMENT

TO THE "BRITISH JOURNAL OF PHOTOGRAPHY."] [*June* 7, 1895.

THE LANTERN RECORD.

CONTENTS.

	Page
LANTERN NOTES AND NEWS	41
THE SEARCH LIGHT. By RADIANT	42
LANTERN MEMS. By G. R. BAKER	43
ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES. By JOHN H. JANEWAY	44
ELECTRIC LIGHT FOR THE OPTICAL LANTERN. By G. R. BAKER	45
LANTERN SLIDES, OR TRANSPARENT PICTURES. By PROF. A. H. SEXTON, F.I.C., F.C.S., &c.	46
THE ELECTRICAL TRANSMISSION AND REPRODUCTION OF PHOTOGRAPHS	47
BREATH-FIGURES. By DR. J. G. McPHERSON	47
RECENT LANTERN PATENT	48

NOTES AND NEWS.

AT Sheffield-street, Clare Market, W.C.—that is to say, in the very heart of London, near to all the principal theatres, and handy for the photographic and lantern dealers—new oxygen works have been erected within the last few months by Messrs. Leonard Chapman & Co.

* * * * *

WE were privileged the other day to have a brief peep at Messrs. Chapman's works, which, as it were, have suddenly dropped from the clouds, so quietly and unobservedly have they been erected. The plant is of the most modern and efficient type. Mr. Chapman informed us that the oxygen his firm will shortly be supplying will be almost an absolutely pure gas, all but one to two per cent. of the nitrogen being eliminated.

* * * * *

A FURTHER point of interest to the users of cylinders is that Messrs. Chapman will fill cylinders at pressures lower than 120 atmospheres, to suit the desires of customers. The firm have evidently laid themselves out to do great things in the oxygen world in the forthcoming autumn and winter. We wish them success.

* * * * *

ACETYLENE, it appears, was an accidental discovery. It has been known to chemists as a hydrocarbon, lowest in hydrogen, and the richest in carbon. Its manufacture has been too costly for utilisation for illuminating purposes until a short time ago, when it was reported in America that Mr. T. L. Wilson, of Spray, N.C., *by the merest accident discovered* a comparatively inexpensive way of making it. He was trying, it appears, to form an alloy of calcium, using an electric furnace in his experiments. He had melted some lime and powdered coal together, when, to his disappointment, the mixture fused into a heavy, semi-metallic mass, and, to get rid of it, he threw it into a bucket of water. The water, to his surprise, effervesced violently, and gave out a heavy garlic-smelling gas, which Mr. Wilson soon identified as acetylene. The solid proved to be carbide of calcium. Calcium carbide, then, is decomposed in water, the water itself being also decomposed. In recombination, the oxygen seizes upon the calcium, forming calcic oxide, and the hydrogen unites with the carbon in the right proportion to form acetylene—a gas which far surpasses all other hydrocarbons in illuminating power.

* * * * *

IT appears that the relief of Chitral was due to the heliograph. On the approach of the Khan of Dir's men, the British garrison heliographed messages, and, interpreting these signals to mean that the relief columns were at hand, Sher Afzul raised the siege and precipitately fled. A Pathan prisoner, it is reported, related the following story:—"Our Mullahs and chiefs talked together, and decided that we should creep upon our enemies in the night, and fall on them when the night was darkest, and every man went willingly for the guns we badly wanted. There were 2000 hillmen who set forth that night to crawl up to the soldiers' camp. We lay for hours in the wet fields, with the rain falling steadily, waiting for our chiefs to give the signal for the great rush. Word came from chief to chief to be ready, and every man crouched, grasping his weapon, to run forward. But at that very moment a devil's gun boomed forth, and, lo! instead of bullets and balls coming out, there burst over us a mighty light, so great that we thought the night had suddenly become day. And we cried aloud to Allah to abate his wrath against us, and, when the great light faded, we all hurried away, and even our Mullahs had no word to say." The explanation stated is, that in order to guard against any such nocturnal attempt to rush to position, a star-shell had been fired from the British camp. When the shell bursts, it shows a brilliant magnesium light, so as to vividly illuminate the surrounding country.

* * * * *

A PARAGRAPH has been going the rounds of the daily press, and has found its way into a number of scientific journals, to the effect that a great refractor of fifty-inches aperture is to be made for an observatory at Pittsburg. The report has little foundation. An effort is being made to provide a larger telescope for the Allegheny Observatory, and to remove the Observatory to a better site, and the city has reserved sufficient ground for the latter purpose in the new park, which is well to windward of all the manufacturing establishments. No effort will, however, be made to surpass existing instruments in size. This, and all further details mentioned in the paragraph, seem to have been invented by an ambitious reporter on a daily newspaper.

* * * * *

DURING a thunderstorm on Mount Elbert, in Colorado, last July, the Coast Survey station on the summit was struck by lightning, and among the pieces of apparatus which were damaged was a two-and-a-half inch Brashear object-glass belonging to a portable transit instrument. The flint lens, which in this construction is on the outside, was cracked across. A closer inspection of the outside surface shows that it is covered with many small and irregular pits, in some of which are imbedded minute pieces of metal, apparently derived from the aluminium cell. The crown lens was uninjured. A new flint lens has been made for the objective by Brashear, and the old one will be kept by the Coast Survey as a curiosity.

* * * * *

OUR contemporary, the *Journal of the Photographic Society*, has been poking a little quiet fun at the recently resuscitated photograph-in-the-eye big gooseberry. "Whoever invented the theory that the eye of a murdered person contains a picture of the murderer, displayed not only a vivid imagination, but also an intimate know-

ledge of the credulity of man. It was only going a step further to add that a Kodak could photograph this impression, and thereby establish unerringly the guilt of the murderer. I remember Rudyard Kipling, in one of his gruesome stories, hinges one of his thrilling incidents on the efficacy of a Kodak snapt in front of the eyes of a dead man, the shot being taken in a very dark room, of course. Now, some one in the *New York Record*, in an article on *Fin-de-Siècle Vidocquism*, 'goes better,' 'straddles' all that has gone before. A Mr. Marsh, who poses as a scientist, having photographed one eye of a murdered woman with his inevitable Kodak, 'the form of a man was found there—a big, burly man, wearing a long overcoat, with the cloth of his trousers badly wrinkled.' Now, here was a typical murderer if you like, whereat 'this revelation caused a sensation,' Then 'Coroner' Bowers accompanied Mr. Marsh, and they made a microscopic examination of the eyes of the dead woman, and 'on one of those of Mrs. Shearman the form of a man was distinctly photographed.' Then we are treated to particulars.

* * * * *

"'The microscope used enlarged the object viewed 400 times its real size. The picture, as revealed, did not show the face of the man clearly. The man's position was such, according to those who made the examination, that the body was shown only from the breast down to the feet. After the first surprise of the startling discovery made by Mr. Marsh was over, he made a most careful examination, which clearly revealed the man's form. He was apparently a big man, with a long heavy overcoat unbuttoned, and which reached below the knees. The wrinkles in the trousers could be plainly seen, and one foot was behind the other, with the knee bending as if in a stooping posture about to take a step.' I commend this discovery to the Secretary of the Calcutta Microscopical Society as something far more wonderful than anything he has ever placed before the members. For the furnishing of a set of 'goodness-gracious' slides, nothing could be more appropriate."

* * * * *

Mr. Andrew Pringle thus illustrates the importance of instantaneous photo-micrography:—"For instance, if we have a blood corpuscle, and if that blood corpuscle happens to be inhabited by a foreign organism, such as that of malaria, and if I am able to show to you that that malaria organism goes through certain cycles, so to speak, of life in the course of such a short time as twenty-four hours, or much less than that; and if one could possibly invent a system of watching those changes of appearance in any organism, whatever it may be; and if one could arrange a photographic apparatus so that those changes might not only be watched but photographed very rapidly at any desired moment; I say that, if this can be done, photography has conferred a very distinct advance upon scientific matters, and has also given us an extremely interesting line of research. This has been done in various ways for a good many years, but I venture to claim that I have managed the thing lately in such an extremely simple way that there ought not to be in future any difficulty for anybody who wishes to investigate such a matter as I have spoken of, and to photograph it easily enough."

THE SEARCH LIGHT.

Leafy June is with us again, and holiday-making will soon be occupying the attention of those who are fortunate enough to be able to get away for a few days in the summer. I need therefore make no apology for reminding my readers that only five weeks separate us from the annual meeting of the Photographic Convention of the United Kingdom, which takes place this year, as everybody knows, at Shrewsbury. Given fine weather, the meeting promises to be both as successful and as enjoyable as any of its predecessors, and I strongly appeal to all photographers, young or old, male or female, amateur or professional, to take the whole or part of their holidays in the Convention week, and thus make the gathering representative and numerous. The Hon. Secretary of the Convention is Mr. R. P. Drage, of 95, Blenheim-crescent, London, W., who will be glad to receive applications for membership (subscription 5*s*.), and give any particulars or information that may be asked for.

* * * * *

On a previous occasion I quoted high artistic authority for the statement that Shrewsbury and its surroundings abounded in great natural beauty, and, from what I have heard from residents in the vicinity, I have little doubt that, by reason of its quietness, peacefulness, diversity of scenery, historical associations, and local welcome, the Salopian town will form a delightful centre for the Convention meetings, at which, I gather, a little photography is made the excuse for much enjoyment of the holiday kind. A list of the proposed excursions is published this week, and it is both varied and attractive.

* * * * *

The Shropshire Camera Club, Mr. Williams (its President), and Mr. Martin J. Harding (its Hon. Secretary), are sparing neither pains nor endeavour to make things comfortable and pleasant for the Convention visitors, and it is to be hoped that their efforts will be rewarded by a large attendance. The more the merrier! The papers, fortunately, are to be few and brief. Mr. Secretary Drage appears determined that his first Convention shall not fail for lack of effort on his part, for he is working like a Trojan. "'Tis not in mortals to command success," he might be excused for remarking, "but I'll do more, ladies and gentlemen—I'll deserve it." And, of course, he will not be happy unless he gets it. So let us all back up Drage, and make him happy.

* * * * *

Fuzzygraphy has been rather roughly handled by a French critic, M. F. Dillaye, who has drawn both Mr. Davison and Mr. Maskell in defence of their own peculiar photographic methods. I always endeavour to exclude the discussion of art subjects from this column, but I cannot resist the opportunity of giving place to a paragraph on the matter which a friend is good enough to send me. The joke of the affair is, that my correspondent is a colleague of Mr. Maskell and Mr. Davison in The Linked Ring:—

"G. D. *v.* F. D., and F. D. *v.* G. D.—In a recent number of *Photography*, G. D. gives his opinion of the *critical views* of M. F. Dillaye, as expressed in the preface to the catalogue of the recent Exhibition of Photographic Art of the Photo Club de Paris. In the May number of the *Bulletin* of the Photo Club, M. Dillaye, in his criticisms of the English photographs at the above Exhibition, utters his opinion of some *photographic views* sent thereto as follows:—'I do not admit the fuzzygraphs of Davison; I do not know—I do not want to know—if in England they are enraptured by them, but I will bet, without fear, that never in France will they be so. It [fuzzygraphy] is only fit for certain subjects—for example, a gale of wind, in which the desired fuzz helps the wished-for effect.' M. Dillaye further remarks: 'But, by-the-by, do you not remark how much the fuzzyists feel the inferiority of their doctrine in perceiving the necessity of generally ticketing their works 'A Windy Day?' It is pleasant to hear both sides of a question."

* * * * *

I have seen many prints and transparencies from the negatives made by Mr. A. L. Henderson during his recent Algerian and Rivieran wanderings, and cannot resist taking the opportunity of congratulating him on the fine work he has produced. Most of his pictures were taken stereoscopically, and, when I say that while Her Majesty the Queen was staying at Nice the irresistible and persuasive "A. L. H." secured permission to make use of his binocular camera at the royal residence, you will understand that special interest attaches to many of his results. Mr. Henderson secured several fine stereographs of the Queen's Indian Secretary, the Munshi Hafiz Abdul Karim, and a particularly good one of the Sovereign herself at breakfast with the Princess Beatrice and Princess Victoria of Schleswig-Holstein. He tells me there is great probability of Her Majesty taking great interest in stereoscopic photography. I am sure I hope this will prove to be the case, so that a further incentive will be given to the popularisation of this charming branch of work.

* * * * *

By the way, if Her Majesty *does* give a fillip to stereography, what are the odds about an excessively enterprising monthly con-

temporary taking it up and "discovering" it, in the same manner as it has "discovered" artificial light portraiture and ceramic work?

* * * * *

STEREOSCOPIC hand-camera work is making headway, I observe, and several new binocular instruments have of late been placed on the market. It is obvious that in street-scene work, or on any occasion when life or motion give the photograph its dominant characteristic, the binocular hand camera places a novel and fascinating power in the hands of a photographer. A subject such as I have alluded to may, and indeed usually does, present no features of interest, beauty, or charm when monocularly rendered on paper; but what a different sensation one acquires when viewing it in the stereoscope! Reality seems to take the place of suggestion; and what higher recommendation than that can stereoscopic work require?

* * * * *

PROBABLY the greatest difficulty that confronts the stereoscopic hand-camera worker will be the provision of a suitable shutter. I don't know if there is already such a thing on the market; but, if not, I will give the makers a hint by saying that my experiences point to a possible demand for a cheap and effective spring catch release stereoscopic shutter working on the lens hoods.

* * * * *

IT is to be regretted that the capital paper, *Lantern Slides Pictorially Considered*, by Dr. Tulloch, and printed in the JOURNAL for May 17, comes at a moment when lantern-slide work is exciting little or no attention. As it is, I hope those of my readers who engage in this branch of work will, if necessary, go out of their way to read the paper and note the various useful points raised. These one is apt in the ordinary way to overlook. Succinctly described, the paper tells you, when once you have obtained your negative, how best to assure that the resulting slide shall not merely be technically but *pictorially* and æsthetically good, a matter which, strange to say, does not much trouble many modern amateurs. I was particularly interested in Dr. Tulloch's remarks on the effect of a white margin round the screen picture. As he says, it not only has an "isolating" effect, but it helps to give a good rendering of the tone values of the picture. I remember, last winter, seeing a set of slides made by Mr. H. T. Malby of drawings of Turner's pictures which, so to speak, were vignetted or white-margined off, which not only enhanced the general effect of each slide, but were, in the aggregate, much more pleasing, less eye-fagging, in fact, to look at than the other slides of nature subjects against which they were pitted. Dr. Tulloch's other suggestions are all equally happy and well-thoughted, and his paper should be read in its entirety by all lantern-slide makers.

* * * * *

FOR the first time in some years I passed Whit Monday within the confines of Cockneydom, studying (and hand-camerating) holiday human nature between Westminster Bridge and Kew. Of course it was a very unfashionable thing to do, and I tremble to think what my aristocratic friends of suburban villadom would say to me if I owned up to having really enjoyed myself in the tuppenny cigar-perfumed atmosphere of 'Arryolatry in which I was compelled to steep myself. But such, nevertheless, was the case. My camera was an object of considerable interest to a great many of the *ouvrier* order, and, from the remarks that were passed upon it, I concluded that a very large number of fairly intelligent people confuse a "snap-shot" camera with one of the automatic kind, such as one sees at street corners, and cannot understand why there should be any essential or effective difference. Indeed, my one regret was that I was not working an instantaneous positive process, which would allow of the results being delivered straight away. I could have made lots of money.

RADIANT.

LANTERN MEMS.

WITH May comes the Conversazione of the Royal Society, when the scientific world concentrates at Burlington House to show the favoured guests of the President the new inventions, improved apparatus, and scientific novelties of the past year. The optical lantern as usual played an important part, or, rather, rendered valuable assistance, on the first of the month, in the demonstrations by Professor Roberts-Austen, Lord Armstrong, Professor Haddon, and Major Holden.

* * * * *

To take them in order, Professor Roberts-Austen was able to project, by means of a mirror and simple lens, the molten contents of a magnesia crucible contained in an electrical furnace having a fireclay case lined with magnesia. The temperature of the furnace was between 2500 and 3000 Cent., the electric arc produced between carbon poles (placed horizontally) being deflected by means of a magnet on to the material being heated. The beautiful colours of the burning mass and the wonderful shapes assumed during consumption made quite an attractive picture on the screen, and demonstrated the value of projections, and how simply for certain experiments they can be arranged to be effective.

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LORD ARMSTRONG'S recent experiments on the electric discharge in air were illustrated by instantaneous photographs, and very curious they appeared on the screen when projected by the Society's optical electric lantern. Major Holden's optical electric meters permitted the record of voltmeters, ammeters, and wattmeters, suitable for direct or alternating currents being magnified by projection on a screen to any desired size, the working parts being comparatively small and the scale painted on glass were available for use with the optical lantern, which, in the case shown, was electrically lighted by one of Major Holden's own arc lamps.

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THE light spoken of at times as "the light of the future" was shown by Professor Lewes, and also the preparation of acetylene from calcic carbide. As it at present stands, I dont see how acetylene gas is available as a *powerful* light for optical purposes, for, although an illuminating power of 240 candles was developed with a consumption of five cubic feet of gas, it required several burners to produce it, one burner alone only giving, say, a fifth of that illumination. This, although very useful for house lighting, and for certain purposes of illumination, is hardly what is wanted for projection where the light must be concentrated in a small area.

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HOWEVER, if acetylene can be produced cheaply, in a commercial way, so that experimenters and lanternists can obtain it, there is very little doubt a burner or jet will be designed that will serve the purpose for optical lantern work and photographic enlargements. For those who have not read the particulars of the production of acetylene, I may mention here that, when calcic carbide is decomposed by water, acetylene is evolved, in the same way that hydrogen is evolved from water by the action of diluted sulphuric acid on zinc. Calcic carbide is forme by the action of carbon on lime at the temperature of the electric furnace.

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A LIGHT of such an intensity that it takes a place midway between the limelight and oil will be an extremely useful one for projection, especially if it can be obtained by simple means, and the gas generated locally, for, as it stands at present, the limelight, if it is produced from compressed gas, will want to be arranged for some time longer beforehand than has previously been the case, on account of the new restrictions and conditions imposed by the railway companies.

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I DO not know how it will affect lanternists in the country, but in town the agents of the oxygen companies have, during the last week or so, been put to considerable trouble by having to deliver every cylinder direct to the goods or passenger terminus of the line that is to take the same. This has been brought about by an order issued by the principal railway companies to the effect that no cylinder is to be taken in at the receiving offices. In one case, a cylinder was despatched through the regular course by collecting

van, and, after being away a day, brought back to the consignor, with the message it could not be received, and a special messenger had at once to be dispatched with it in a cab to the station, so that the gas should be available for use that evening, the lanternist being advised by telegram of the fact.

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It is easy to see what an amount of annoyance the non-arrival of gas may cause, and so, in future, all requests for cylinders of gas should be made in good time before actually required, and, if there is any uncertainty about this, a full cylinder or a pair always kept in reserve. If the destination of the cylinder referred to above had been over fifty miles, and no trains served to carry it there in time, the consequent disappointment would have been very great.

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The way out of the difficulty, as far as dealers are concerned, if the carriers cannot, and railway companies cannot arrange differently, is for the gas-compression companies in London and elsewhere, where the gas is made, to have their own vans and collect from their agents the empty cylinders in the morning, deliver them filled in the early afternoon, and call, say, two hours after, for the cases duly addressed and with the required declaration, and take them to the respective stations, goods or passenger, as the case may be. To give an idea that it could not be worth while for agents to do this themselves in every instance, take a case that occurred during the last week, when some cylinders had to go by South Eastern Railway, others South Western Railway, and others again Great Western Railway. The cart, having to go a round represented by Bricklayers Arms, S.E., Nine Elms, Vauxhall, and Bishop's-road, Paddington, occupied between five and six hours, putting it quite out of the range of ordinary run of opticians' or photographic dealers' business. Lanternists, however, will no doubt prefer entrusting their orders to the same agents as before, who understand their individual requirements, and have hitherto made special arrangements to suit them.

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Even the oxygen-compression companies will be sorely tried if this stupid regulation is not withdrawn, for they will have so much work thrown on their hands that has always been considered a legitimate part of the railway work, and which cannot be performed by a single or two vans, for the distance to be covered from the Great Eastern on the one side of London to the Great Western on the other, and for the northern and southern lines, would necessitate several vans leaving about the same time to go in the specified directions. The new condition is so illogical that it cannot, I should think, last, for, if it is on the score of danger it is made, how can it be worse for receiving offices and vans this side of the terminus to receive cylinders than for them to be in the parcels office of station, carried by train, or afterwards delivered by the companies' own carts or vans? It will be interesting to know how country lanternists are affected by the change.

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It is to be hoped that the Government inquiry, now arranged for, will result in gas cylinders and the conveyance and use of compressed gas being put on a satisfactory footing; also that the decisions may be known as early as possible, so that proper arrangements can be made by the trade in good time for next lantern season. The names of the professors and experts forming the committee or board of inquiry will be a guarantee that the subject will be exhaustively treated in its practical aspect, as well as on the score of safety in use and conveyance.

G. R. Baker.

ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES.*

But little mention of the use of magnesium is to be found in the journals of the day during the next decade, the high price of the metal effectually preventing its general use by photographers. In 1883 or 1884, the cost of production having been much reduced, the employment of magnesium as a source for artificial light began to be revived, and in 1885 new methods were sought for of burning it, so as to increase the intensity of the light. Late in 1885, The British Journal of Photography stated that a most brilliant actinic light could be obtained softened and diffused, by burning magnesium in a long glass flask filled with oxygen gas.

January 26, 1886, Mr. Beach, then President of this Society, read a paper and exhibited a new magnesium light of his own construction for burning magnesium ribbon in oxygen gas (exposures also being made) before the Society.

He also described a second form of magnesium light recommended by W. H. Harrison, of London. Simply a brass egg-shaped funnel having an aperture in the bottom of about three-sixteenths of an inch in diameter. Under the mouth of the funnel is an alcohol soldering lamp having a long horizontal oblique nozzle which allows the flame to come under the mouth, but permits the wick to be a trifle to one side. A tray is placed on the floor to catch the sand. Equal parts of fine magnesium powder and white sand is dumped into the funnel, and falls in a steady stream, on the hour-glass principle, upon the alcohol flame. A Bergman magnesium lamp intended to unwind magnesium ribbon, as fast as it burns, was also shown. At another meeting of the Society later, Dr. J. J. Higgins' lamp was shown. The principle of its mechanism was forcing a quantity of powdered magnesium into and through a powerful alcohol lamp by atmospheric pressure. Swansom's oxymagnesium lamp was introduced into England about this time.

The *Year-Book* of 1888, reviewing the previous year says: "Magnesium lighting has taken a prominent place even in the every-day work of the photographer, and this appears due to two circumstances: the revival of the flashlight by Piffard, and the reduction in the price of the metal. Not only has the flashlight been used to record social events, but also applied to scientific investigation, Julius Sachse, of Philadelphia, having by its aid obtained admirable photographs showing the successive stages of the development of the bud and flower in the case of the night-blooming cactus."

Dr. H. G. Piffard, then a member of this Society, first used gunpowder three parts, magnesium powder one part; but not being satisfied with the results of his experiments he turned his attention to ordinary negative gun-cotton, and at last settled upon the following proportions: Gun-cotton, *q.s.*; finely powdered magnesium, twice the weight of the gun-cotton used. He simply sprinkled the magnesium upon the gun-cotton, and touched it off with a match. He also produced the flash by means of a pistol, and made negatives thereby.

The results obtained by this process suddenly became popular, and flashlight photography, with the aid of magnesium, was the order of the day. Many portraits were made at this Society, and by prominent photographers in this city and elsewhere.

When Cowles improved the mode of manufacture of aluminium in 1885 by electrolysis, thereby reducing cost of the same, it was recommended that a certain proportion of aluminium should be added to the magnesium powder to increase the intensity of the light and lengthen it action.

Magnesium as a means of illumination for submarine photography was proposed about 1889 or 1890. In 1893 Mr. Bontan perfected a magnesium lamp for that purpose, which he and others employed with very good results. For a brilliant light required for a short time only, the use of magnesium in the form of a fine powder is invaluable.

Vogel states that he determined the relation of magnesium to the electric light by means of his scalen photometer as follows: A Siemens light of 800 candle power without reflector, produced the same effect in two (2) minutes at a distance of seven (7) inches as 366 grains of magnesium wire at the same distance. The light from a Bunsen battery of fifty cells showed feebler action, being about seven-elevenths of Siemens' light.

Photographing by Petroleum Light.—In a report by Drs. Mallmann and Charles Scolik, 1886, we learn that the first attempts in photographic portraiture by petroleum light were made by Victor Schumann in 1881, and recently he repeated his experiments with cyanine-ammonia bath plates, and obtained with six lamps of forty-five candle power, a good negative in two and a half minutes. That many comparative experiments have shown erythrosine bath plates to be in petroleum light twenty to twenty-five times more sensitive than the mother emulsions. With a light force of from 200 to 300 candles, petroleum, or gas, it is possible to photograph in a shorter time than formerly in daylight with wet-collodion plates, and, what is more important, the effects are orthochromatic. With a 2 B Dallmeyer second stop, the time of exposure varies from three to ten seconds. Lighting an atelier for purpose of portraiture and rapid exposures requires from 250 to 300 candle power. The report goes on to describe the lamps, circular burners, the room well ventilated and to be painted white, the arrangement of the lamps, with oblique reflectors, white reflecting screens, and a background painted in a light grey tone.

The lamps recommended are the so-called Phare lamps (lighthouse) made in three sizes.

No. 1 of 16″ burners of 62 candle power.
No. 2 of 22‴ burners of 83 candle power.
No. 3 of 28‴ burners of 126 candle power.

Gaslight.—Gaslight for photographic purposes in portraiture was first used in England with success, according to Eder, Vogel, and a recent French author, by Law, of Newcastle, in 1857. His apparatus consisted of a very powerful burner and a suitable reflector. The burner was made after Higham's model, containing sixty-eight openings and gave a light of 1250 candle power (?). The reflector was made of galvanised iron and strips of

* Concluded from page 40.

silvered glass. The top part giving the top light and the sides the side illumination. As the light and heat were disagreeably felt by the sitter, Law, to modify this, erected a screen of blue glass 40 × 40 inches to be placed between the sitter and apparatus. The exposure varied between eight and fifteen seconds. In 1867 or 1868, J. A. Hogg, gas engineer of Edinburgh, discovered a method of producing intense light with coal gas by mixing it with atmospheric air. "The mixing of the gases is heightened after passing through a burner of irido-platinum wire at a determined pressure. In a few seconds the metal becomes heated up to a white heat, the flame disappears, and an intense white light is the result."

In 1870, the Phillipp carbo-oxygen lamp was exhibited at Cologne, Germany. The liquids employed consisted of a liquid hydrocarbon, very rich in carbon and fifty-three per cent. of atmospheric air. It was patented in England and America. Edward Frankland, in his researches published in 1877, included one on coal gas for artificial light in photography.

"In 1882, Clamond, an engineer, constructed a burner which bears his name and which gives a splendid light. It consists essentially of a metallic box in which the gas is heated in passing through baffling separations, whilst at the same time it is mixed with a certain quantity of air under pressure, and when burning at the upper orifice it gives out, as the Bunsen burner, a very hot flame, but of very little luminosity; this flame is directed on a small basket, conical in shape and formed of pieces of magnesia vermicular in shape.

"A plastic paste is made by using magnesia in powder and a solution of acetate of magnesia; this paste pressed into a cylinder comes out through a small opening in a vermicular strip about two millimetres in diameter, and rolls itself on a conical mandril made of wood; during the operation care is taken to cross the strips. This little basket, after drying and again baking, is held in place over the burner by a platinum armature.

"The most powerful burner consumed five hundred litres of gas in an hour, and three cubic metres of air under pressure; it gives a luminous power of about eighteen Carcel burners. The light is very beautiful, and has been used under the same conditions as the oxhydric light."—*M. H. Fourtier.*

December 9, 1884. An enlargement was made by the President of this Society, Mr. Beach, nearly up to life size, by a combined gas and platinum lamp. The burner consisted of a small thimble or cone formed by platinum gauze. To this burner (Lewis's) a small quantity of common gas with a large admixture of atmospheric air was supplied, the proportions of the mixture being air four parts, gas one part. An exposure of precisely ninety-one seconds was given, and the enlargement developed into a very beautiful and sharp picture.

Early in 1887, Mr. John Bartlett read before the Philadelphia Society a paper calling attention to the great advantages of the use of gaslight in photographing interiors, it giving a uniform lighting. He used five bat-wing burners of a chandelier suspended from the ceiling of a 15 × 30 feet room. The results presented by him were very fine.

1888. A writer in this city asked the editor of the *Photographic Times* whether gaslight had ever been employed in producing a negative. He had never seen it mentioned, and informed the editor that he had obtained a very fair negative by its use.

Vogel states in 1886 photography with artificial light took an entirely new departure upon the discovery of the colour-sensitive plate, by which it became possible to make exposures with ordinary yellow gas and lamp-light. Himly was the first to introduce the method of illumination with yellow artificial light, and it appeared as if the electrical light would have to compete with it for supremacy. But such results have not taken place.

The Welsbach Light.—In 1883, reports from Vienna stated that an Austrian physicist, Prof. Aüer von Welsbach, had succeeded in producing an exceedingly thin hood or mantle of zirconium oxide, capable of receiving a high degree of incandescence when submitted to the action of heat, without becoming disintegrated and of sufficient strength to resist ordinary shocks of service. The English patent bears date of December 1885, May and July 1886. As stated in the first specification, the substances used in impregnating the hood were oxide of zirconium, oxide of lanthanum, and oxide of ytrium. The second patent relates to the employment of other substances to produce with zirconium yellow, orange, or green light. To describe the mode of preparation of these different substances would occupy too much time at present.

The arrangement of the Welsbach lamp may be described as follows:—A hood of fine fabric, such as net, is impregnated with the zirconium solution, and when dried and shaped symmetrically is suspended by platinum wire over a Bunsen burner, the whole being perfectly enclosed within a glass chimney. When the burner is lighted, the combustible portion of the hood is rapidly burned away and the water of the solution evaporated, leaving a skeleton of zirconium oxide a perfect replica of the original fabric. Under the action of heat this delicate surface is brought up to a vivid incandescence, though it does not reach its maximum illuminating power for several hours. If not broken by accident, through flaw in the structure or from other causes, it maintains its maximum brilliancy for a long but variable period, dependent probably upon a variety of external and structural conditions; this period of maximum usefulness is stated to range from 300 to 1000 hours. It is clear, however, that a time comes when, supposing the delicate oxide skeleton has withstood the ills which it is peculiarly heir to, it begins to fail, and through another long period of gradually decreasing efficiency becomes ultimately useless. The light is far better than that given by gas, and is absolutely steady. The colour is preferable, though it may be mentioned that normally the Welsbach light is intensely, almost ghostly, white. A remarkable feature of the light is the relative small amount of heat given off. The chief weakness would seem to lie in the excessively delicate character of the hood. The burner sold by the Company in this city, burning three feet of gas per hour, gives a light of thirty-candle power.

The use of these lamps has been attempted in some Parisian *ateliers* and gave excellent results. But it was found that it was not possible to move them, when lighted, without running the risk of breaking the delicate tissues of oxides.

It is said that this style of light is very successfully used for enlargements.

A New Light for Photographers.—By a happy chance a cheap and easy method of preparing acetylene has been discovered, which, it is said, bids fair to revolutionise some of our time-honoured methods of illumination.

Acetylene is a combination of carbon and hydrogen, many properties of which have for some time been known.

From it can be built up all the other hydrocarbons capable of being used for illuminating purposes, as well as the great number and variety of bodies hitherto produced from coal and hydrocarbon oils, even supplying us with many alcoholic beverages now so freely used, should both the corn and grape crops fail.

This discovery was made by chance by Mr. S. L. Wilson, an American, whilst working with an electric furnace for an entirely different object.

He found that chalk or lime with carbon in any form can, in an electric furnace, be fused, with the formation of calcic carbide, and that on the addition of water to this, a double decomposition takes place, the oxygen of the water combining with the calcium of the calcic carbide forming lime, whilst the hydrogen unites with the carbon of the calcic carbide forming acetylene.

At this point Prof. Venable, of the University of North Carolina, took up the matter, and it was there that experiments soon proved that a pound of this calcic carbide would yield 5·3 cubic feet of acetylene gas.

It is stated that calcic carbide will soon be placed upon the market, probably in the form of rods or cylindrical cartridges; and, to make it yield up the acetylene, all that is necessary is to place a small quantity of it in a suitable metallic vessel and allow water to drop upon it, the acetylene then passing off in a continuous stream, the solid mass remaining in the vessel being converted into slacked lime.

Acetylene is soluble in water, alcohol, and most other liquids—can be condensed by pressure into a liquid, and this, when sprayed into the air, absorbs so much heat that some of the escaping liquid is converted into a snowli ke solid, which, by applying a light to it, burns until it is all converted into a gas and consumed. Diluted with twelve times its volume of air, it is highly explosive. This explosive character ceases when the dilution amounts to twenty parts of air.

The gas is so intensely rich that small flat-flame burners are required for its consumption; but, if the consumption amounts to five cubic feet per hour, then the illuminating value is equal to no less than 240 candles.

It is dazzling in the brightness and steadfastness of its flame, and when compared with ordinary coal gas its superiority is wonderful, the latter appearing dim and flickering. There is no dark centre to the flame, as is the case with ordinary gas. The illuminant is somewhat peculia, rviewing it from a popular point of view, in that it gives off only one-half of the heating power of ordinary gas. The gas can not only be obtained in gaseous and liquefied states, but also as a solid. The latter is most interesting, for, when cast upon the surface of liquid mercury, it had the effect of freezing that element to a solid mass, and a thermometer placed in its midst registered a fall of 118° below zero.

At present the whole thing is so new as well as so surprising, that we are apt to be sceptical; still we think that, in this rapid age of ours, the time is not distant when gas from acetylene will be of the highest value to photographers. Its great intensity and almost trivial cost will enable the humblest of us to use it at will. JOHN H. JANEWAY.

ELECTRIC LIGHT FOR THE OPTICAL LANTERN.

THE convenience, simplicity, and cleanliness of the electric light make of it at once the illuminant *par excellence* for the lanternist, and when its intensity is considered it so outdistances all other light that the adoption of the arc light must follow as a natural consequence wherever current is available. Until quite recently, when a semi-automatic lamp was placed on the market, it was thought that nothing short of an expensive automatic arc lamp would answer for optical projections; but since the simple hand-fed lamp has been in use at the Society of Arts and the Camera Club, &c., the matter has been so thoroughly cleared of any doubt that it has practically superseded the limelight at both those places. The chairman for the evening at the Lantern Society's meeting at the end of October paid a high tribute to the Davenport semi-automatic arc lamp, when, in reply to a question as to whether the light was steady and uniform

in colour, he said, in effect, as follows:—"He had seen the lantern worked a great number of times at the Society of Arts during the past eighteen months when the new form of lamp had been used, and never on any occasion had there been the slightest difficulty with the disc either in flickering or other ways; in fact, he considered it worked most satisfactorily."

As this cannot be said of complete automatic-fed lamps, in a general way, for they require attention, as they are apt to feed spasmodically, it speaks volumes for the simpler lamp, with the top carbon hand fed and the bottom automatic, for by this means a regularity of light is preserved with no more trouble to the operator than is the turning of the lime cylinder when using the oxyhydrogen light.

Now, what are the conditions necessary for using an arc lamp in a lantern? First, we must have electricity on at the main of not less than sixty volts in pressure, or six to eight ampères in amount. As the electrical companies supply, in a general way, the current at 100 volts, iron or platinoid wire resistances are inserted between the supply and the lamp to reduce the pressure to the minimum for satisfactory working with the arc lamp for projection.

The connecting wire from a branch supplying incandescent lamps must be of sufficient size to be safely used or from a main cable either at the entrance from the street or nearest full-size cable in the building; not less than 14 B.W.G. for one, and larger for more than one arc lamp. A fuse would be inserted in this independent circuit, so that no trouble could be caused to other lights in the building if anything went wrong with the lantern light, and a switch independently of, or attached to, the resistance is convenient between the lantern and a well-constructed wall connexion.

As these fittings have to be passed by the Electric Supply Company, who in turn have to act up to certain Board of Trade regulations, the use of electric light may be considered *perfectly safe*. Certain difficulties in the semi-automatic lamp, inseparable from early patterns of new apparatus, have had to be surmounted, but now, with the modifications of the feeding spring for the lower carbon, and improvements in the connexions, a lamp is available that will give no trouble to the operator. The design also ensures the maximum of the arc illumination being available, for the angle of the carbons is such that the major part of the light goes forward horizontally; whereas, if the carbons were vertical instead of sloping backwards, a large percentage of the light would be in a downward direction, and so not available for projection.

In some lamps recently introduced, the two carbons are of different size, both being fed automatically by springs. It is known that the positive carbon, when both are the same size, burns away twice as quickly as the negative; but, by putting this of much larger size, they are somewhat equalised, and, if other difficulties did not creep in, this plan would be a royal road to success. As, however, the light is not so steady with two different size carbons, on account of the irregularity of the burning carbon, or, if both are of the same size, the length (including the automatic feed) prevents their use for a two hours' entertainment, if they are to fit in ordinary size lanterns. The difficulties with the softening of the spring, &c., in the lower carbon holder (now overcome by the simple modification of an outside spring) are intensified if this system is adopted for feeding the upper carbons, for the flame of the arc and increased heat upwards make the problem of spring feeding a difficult one for the upper carbon. As regards the candle power of small-size electric arc lamps, it can be almost anything required from 800 to 5000 candle power, according to the size carbons used and the amount of resistance inserted in the current. The Davenport lamp, with the eight millimetre carbon represents, as usually employed for optical lantern work, 800 to 1500 candle power, for with this there is no danger of injuring slides from heat, while the definition is as perfect as possible, the small size of the area of the light giving it a decided advantage over the limelight, if just a little care is taken in feeding the top carbon down by the pinion head which, for convenience, comes outside the lantern.

Various modifications can be made to a hand-feed semi-automatic lamp of the type alluded to that will make it useful for photographic purposes, so that it does not require attention in feeding so often, or when used for spectrum analysis and other purposes, by insertion of different carbon holders; but generally it may be summed-up that small-size carbons, both of the same size, one automatic and the other hand-fed every two minutes or so, as one would turn a lime, is the most satisfactory yet devised for optical-lantern projection, and, for special microscopic projection, the same kind of lamp, only more frequently fed to keep the arc short with mechanical adjustments for fine centering. Electricians will be conferring a favour on all scientific men if, in fitting up institutions, halls, and private houses, they so arrange the wiring that, if an electric arc lamp requiring sixty volts to work it satisfactorily is wanted to be used, it can be done with safety by simply connecting the wires to a wall plug, and, besides, it will be an additional source of income to the electric supply companies. With the current, as usually supplied, of 100 volts, it will only then be necessary for a resistance to be placed in the circuit to make it suitable for the arc lamp for projection purposes.

G. R. Baker.

LANTERN SLIDES, OR TRANSPARENT PICTURES.

[Photographic Scraps.]

With many amateur workers the making of lantern slides has become a favourite branch of photographic art; but this form of picture has not attained anything like the popularity to which its beauties entitle it. Probably the name has had much to do with this, for a "lantern slide" seems to imply the necessity for a lantern in which to show it, and those who were not the possessors of such an instrument often felt that the subject was one in which they had no interest. Had the name "transparency" been always used, this would not have been the case.

To the possessor of a lantern the making of lantern slides needs no recommendation, and it is to those amateurs who have not one that these notes are chiefly addressed.

It must be remembered that a glass transparency is the most beautiful form of print that can be made, and indeed it is the only form which will reproduce in full all the detail of the negative, in its full delicacy and beauty far excelling even the best paper print. This is, of course, only a recommendation to those who admire the wealth of detail which is seen in nature, and who wish for a reproduction of this; those who prefer a fuzzy smudge will, of course, abjure the transparency altogether, unless indeed they view it with a lens out of focus.

But how is a transparency to be seen without a lantern? In many ways. Even viewed over a piece of white paper by reflected light, it shows much of its beauty, and there are now in the market several forms of instruments specially designed for the purpose. These are generally called lanternscopes, as this was the name given to the first one which was brought out.

The first lanternscope was a box provided at one end with a lens and at the other with a slide for the transparency and a sheet of ground glass. This answered admirably, but looking at a series of objects with one eye soon becomes very fatiguing. To meet this, binocular instruments were introduced, which seem to answer very well. The best way, however, of viewing a transparency is by means of a large lens, exactly similar to that used for the graphoscopes; indeed, by very slight modification, one of these can be made available. The lens should be about four inches in diameter and ten inches focus. As both eyes are used, and as they need not be brought close to the lens, the instrument can be used for a long time without fatigue. It is a wonder that no maker has put a lanternscope of this form on the market.

Viewed through a lens, as in any of these instruments, the transparency is seen to stand out brilliantly, the effect being almost stereoscopic; indeed it is a very good substitute for a stereoscope without the trouble of taking special negatives or making special prints.

There is no reason why the regulation $3\frac{1}{4} \times 3\frac{1}{4}$ slide should be used, though it answers very well. $3\frac{1}{4} \times 4\frac{1}{4}$ is usually better. Though, if the transparencies are likely to be used in the lantern, the smaller size should be selected, for the sake of uniformity with other workers. It is a pity, however, that lanterns and carriers are not made so as also to carry ordinary quarter-plate size. Still more effective results may be obtained by using 5×4 or half-plate sizes, and, of course, larger lenses. As transparency plates in all sizes can be had at "ordinary" prices, there is no reason why a worker should not select that size which he finds most suitable for his work and his taste.

When the transparencies are to be made by contact, the negatives should, if possible, be taken on plates the same size as those to be used for the transparencies, as it is often very difficult to select a view so as to utilise a portion of it as an effective slide. Where reduction in the camera is used this is, of course, of no moment.

Lantern plates are now made of such excellent quality that there is no difficulty in obtaining really good results with care and due consideration as to the details of the method used. It is advisable to select one make of plate, and, having mastered the maker's methods of using it, to adhere to it for regular work. To the ordinary photographer the processes are merely means to an end, the finished picture, and therefore, having found means which lead satisfactorily to that end, he can gain nothing by change. The chief points to be attended to in the selection of a plate are its power of giving a brilliant image without any tendency to fog. Fog in a negative is not of much moment unless it be excessive, in a transparency it is fatal. Speed is of little moment, indeed a somewhat slow plate is often better than a very quick one, as allowing greater latitude in exposure. Where the transparencies are made by contact, artificial light will, of course, be used; a paraffin lamp is very convenient, as it is easily moved to any required position, but a gas lamp answers equally well. It is a good rule to always expose at the same distance from the light and to vary the time only. It is much easier to allow for variation of one factor than for two. About two feet is a good distance

it should rarely be less. Magnesium wire may be used by those who prefer it.

When the transparencies are not the same size as the negatives, one of the many adjustable frames on the market should always be used.

As to the colour which the slide should be made, there is a great difference of opinion or rather taste. The writer prefers for almost all subjects, a good black, other workers prefer various warm shades, from brown black to fiery red. Fortunately there are plates on the market to satisfy all. Black tones are given by plates such as "Ilford Special Lantern Series."

By modifying the developer various tones may be obtained with them, but those who prefer warm tones will find it best to use plates such as "Alpha," with which a much more satisfactory range of colour can be obtained. As plates of this type are slow, the exposures are somewhat longer.

The choice of developer is another matter on which there is room for great diversity of opinion. There are seven or eight developers on the market, each of which has its adherents, and with any of which good results can be got. One is often asked which is the best developer for lantern plates, and the only possible reply is that there is no best. The best for each worker, is that which he finds easiest to work and with which he gets the best results.

As a transparency developer for beginners the writer has no hesitation in recommending hydroquinone. It is easily handled, keeps well and gives excellent results, but is much inclined to give brown tones if the development be unduly prolonged. The Ilford formula answers admirably, and gives excellent results. There is one objection to the use of hydroquinone, serious or not according to the view of the user, and that is the way in which its action is hindered by a low temperature, so that in the winter the solutions should be warmed, and the developing dishes have a little hot water poured in them (and out again), before use. The writer frequently uses amidol or metol for transparency work. Eikonogen gives good results; pyro is sometimes used; ferrous oxalate is excellent, but is a little more trouble. No doubt, after a sufficient experience, equally good results can be obtained with any one of these. Whichever is used, it should be used weaker than for negatives. A-one solution developer answers as well as any other, since a correct exposure can be given.

The uses that can be made of transparencies have not been exhausted, but little use is yet made of them for decorative purposes, though, backed with finely ground glass, there are many purposes for which they could be used. Backed with white paper, they make pictures which are more beautiful than most paper prints, and by varying the tint of the backing very pretty results may be obtained. It must be remembered that, used in this way, the pictures are reversed, so that the transparencies should be made reversed in the camera. Prof. A. H. Sexton, F.I.C., F.C.S., &c.

THE ELECTRICAL TRANSMISSION AND REPRODUCTION OF PHOTOGRAPHS.

There seems scarcely any practical limit to the capabilities or achievements of electricity. The transmission of telegraphic signs, writings, and articulate sounds from a distance by its subtle agency were startling announcements enough in their days, but even those wonderful accomplishments appear very closely run by the "electrophotograph," one of the latest electrical inventions recently exhibited in the United States. The transmission and reproduction of photographs or pictures by electrical means can, at first blush, scarcely be considered tidings of secondary interest and importance to those which heralded the birth of the telegraph, telephone, phonograph or teleautograph, although the present invention is essentially a development of those valuable discoveries.

We are certainly living in an inventive age, says *Invention*, and one in which electricity plays probably the most prominent part. The telephone has become an instrument of practical necessity to commercial life; the teleautograph, or writing telegraph, is apparently emerging from the experimental stage, and, as recorded in our last issue, is now on exhibition in London. Scarcely have we time to become acquainted with this remarkable invention than we receive news of a discovery by which a photograph can be "transmitted" and engraved although scores of miles away from its negative. To an ingenious and persevering American engineer, Mr. N. S. Amstutz, of Cleveland, Ohio, is due this startling attainment. This gentleman, although prominent in both the mechanical and electrical branches of engineering, with praiseworthy determination made himself acquainted with all the details of manipulation involved in book and newspaper illustrative work. By acquiring this practical knowledge he was enabled to battle with, and so far conquer, the difficulties presented in this problem.

The inventor is not, we understand, content with attaining a crude form of reproduction or engraving, but aims at the execution of comparatively high-class pictures; indeed, it is asserted that delicate tracings on gold and silver and other metallic materials can, with equal facility, be effected by the apparatus devised by Mr. Amstutz.

In the invention at issue, practically, the functions of the telephone and the phonograph are availed of, inasmuch as an undulating current of telephonic nature transmits the impression on to a now familiar waxen cylinder, like the phonograph; moreover, like the teleautograph as well as the two previously cited instruments, both receiving and transmitting apparatus are necessary adjuncts to this interesting device.

According to an American contemporary, we learn: An ordinary photographic negative is made of the subject to be transmitted, an exposure is made under this negative of a film of gelatine, sensitized with bichromate of potash, and by which the effect is produced of rendering insoluble in water the parts exposed to the light which pass through the thin portions of the negative, while those portions protected from the action of the light can be dissolved away, the capabilities of dissolving away varying with the intensity of shade or light upon the negative. After thus removing the soluble portions from the film, there remains the same picture as appeared on the negative, but entirely in relief.

The film is now attached to the surface of a cylinder, and caused to revolve; a tracer, adjustably connected to a lever, rests upon the same, and, as the film revolves, rises and falls with the undulating surface of the same, communicating an up-and-down movement to the end of the lever, in a multiplied degree. A number of tappets or levers are arranged so that one end presses upwards on the lower end of terminals, the opposite ends of the tappets varying in distance from a horizontal line over the end of the lever. When the lever is at its lowest point, as influenced by a depression in the gelatine film, all the tappets press up against the terminals; with a further revolution of the cylinder and an elevation in the film forcing the lever upward, all of the tappets' contact with the terminals, except one, is broken, the height and depth of the film's surface measuring the number of tappets in contact with the terminals. This, in substance, comprises the transmitting apparatus.

One terminal of a battery is grounded, and the other is connected to the fulcrum of the tappets, and the current passes through the same to the main line wire, and thence on to a distant solenoid at the receiving end, and to the ground. When all of the tappets touch the terminals, all the resistances are in parallel, and the total resistance is least and the current greatest; and, *vice versâ*, resistance greatest and current least as the number of tappets' contact are broken. By this arrangement of the resistances there are rises and falls in the current corresponding to those on the film's surface. This variable current, circulating around the solenoid of the distant receiving instrument, produces a varying pull on the core attached to the end of the lever. A diamond-shaped cutter is attached to the latter, beneath which is a plain gelatine or wax film attached to a cylinder.

It will be understood that with one revolution of the cylinder, as the tracer follows the elevations and depressions upon the film, the free end of the lever is made to contact with the ends of one or more of the tappets, permitting more or less of a current to pass through the resistance, and exerting thereby more or less of a downward pull on the end of the lever.

Supposing, now, that a relief plate or film has been fastened upon the transmitting cylinder, and a smooth film of gelatine or wax upon the receiving cylinder, and both are revolved at the same speed. One revolution would cause the style or tool to cut a line around the plain film, irregular in its depths and widths, caused by the varying pull on the lever's end by the core of the solenoid. A picture is not made by one line, but one line is, however, an element of a whole picture; so, as the cylinder revolves, the tracer and the cutting tool are moved along by a screw, and thus another line is produced by the side of the first one, with varying depths and widths of cut corresponding to the neighbouring waves of surface on the film. The lines are thus continued over the same from end to end, and, when this engraved film on the cylinder is afterwards electrotyped, it is ready to be printed from in the ordinary manner.

Illustrations of some of the results obtained by Amstutz's "artograph" are given in a recent issue of the *Scientific American*. One is a reproduced portrait of the ingenious inventor himself, and the second an illustration of a little boy standing beside a large dog. This latter is particularly successful; it took only three minutes, it is stated, to engrave. It is suggested that, by means of telegraphic instruments at present in use, in the near future representations of incidents occurring in, say, London in the evening may be faithfully reproduced in the following morning's paper of New York and *vice versâ*, thus extending the scope of the pictorial age now prevailing to a very wide extent.

BREATH-FIGURES.

There is something exceedingly fascinating about the curious set of phenomena known as breath-figures, and the explanation of their existence. New light has lately been thrown upon their nature; and their study is interesting.

Fifty years ago, Prof. Karsten, of Berlin, placed a coin on a piece of clean plain glass, and passed through it a current of electricity. Nothing was seen on the glass when the coin was removed, but when he breathed on the plate the characters of the coin became visible. At the same time Sir W. R. Grove succeeded in producing impressions with simple paper forms. Möser, of Königsberg, produced figures on polished surfaces by placing on them rough bodies. Riess described a breath-track made on glass by a feeble electrical discharge.

But Mr. W. B. Croft has lately been investigating the matter with exemplary care and perseverance; for it requires some practice to manage the electrification properly. This was his most successful plan: Place a glass plate on a table for insulation, and put a coin of any metal on the centre of the plate. In many cases the image on the coin does not touch the glass on account of the projecting ring; but these seem to be

best suited for the experiment. Arrange a strip of tinfoil from the coin to the edge of the glass; on the coin place a smaller plate of glass, and above that plate place a second coin. Connect the tinfoil and the upper coin with the poles of an electric machine, and turn the handle of the machine for two minutes, so that continuous sparks may pass. On taking up the glass, nothing can be seen on it, even with the help of a magnifying glass. Yet on the glass there is a latent impression; for, by breathing on the side of the glass next the coin, a clear frosted picture of that side of the coin which had faced it will be produced, even to the smallest details. The whole projecting parts of the coin have a black counterpart, and there is a marvellously fine gradation of shade corresponding with the depth of cutting on the coin. If this breath-figure be examined under a microscope, the moisture will be seen really deposited over the whole; but the size of the minute water particles increases as the part of the picture is darker in shade. Around the coin's disc is a black ring, a quarter of an inch in breadth. Should the coin used have milled edges, radial lines will pass through this ring.

If these breath-figures are carefully protected, there is no apparent limit to their permanence, even for years. Months after they have been set aside, the black ring round the disc gradually changes into several rings, forming beautiful concentric alternations of black and white. If half a dozen coins, lying in contact side by side in the form of a cross, be placed on insulated glass, then over the coins a test glass, with a corresponding cross of coins above it, beautiful breath-figures will be produced. In the black spaces between the circles are clear white lines, which are common tangents to the circles, when the coins are of the same size. If coins and glass plates be piled up alternately, and the outer coins be connected with the poles of the electric machine, perfect images are formed on both sides of each glass. If several glasses be placed between two coins, only two images will be produced, one on each of the outside glasses. In all cases the glasses must be scrupulously well cleaned with chamois leather.

Heat will produce similar results by the molecular bombardment to which the surface of the cold glass would be exposed by the gases heated by the coin. If a very hot, clean coin be placed on a cold mirror, and be removed after being cooled down, nothing will be seen on the glass; but, if the mirror be breathed upon, an exact image of the coin becomes visible. If the point of a blowpipe be passed over a clean mirror, with sufficient quickness to prevent the sudden heating from breaking it, nothing is seen after the glass is cold; but, if you breathe upon its surface, the track of the flame is clearly marked. While most of the surface looks white in consequence of the light reflected by the deposited moisture, the track of the flame is quite black; but, under a microscope, this track is discovered to be wet with a thin, even film. If the jet of the blowpipe be tracked over the mirror so as to form figures, the breath on the cold plate will reveal the figures, traced with great distinctness. The hot coin in some way seems to alter the dust-particles on the mirror, causing them at certain parts to reflect more light than at others, to be brought out more plainly when the moist breath develops them.

Probably all polished surfaces may be similarly affected. A plate of quartz gives most beautiful images, perfect in details, retaining their freshness longer than those on glass. If a piece of mica be split, and a coin be slightly pressed for half a minute on the new surface, without any current of electricity or application of heat at all, a breath-figure of the coin is left behind. If a leaf of paper, printed on one side and thoroughly dry, be placed between two plates of glass, and left for ten hours either in the daylight or in the darkness (a slight weight being placed over to keep the paper even), nothing is seen; but as soon as you breathe on the glass, a perfect breath-impression is made of the print on both pieces of glass. These are generally white, and are most easily produced during keen frost. If paper devices be placed for a few hours under a plate of glass, clear breath-figures of the devices will be produced when you breathe on the glass. After an ivory point has been traced in any shape over a glass plate with slight pressure, a black breath-figure of the writing is made at once. If plates of glass lie for some hours on a table-cover which has on it figures worked in silk, strong white breath-figures are impressed on the plates, the silk coming out white and the cotton black.

Some exceedingly curious permanent illustrations of the phenomena are to be found. There are several impressions of brasses in the basement under Henry IV.'s chantry in Canterbury Cathedral. On the walls appear shapes of the effigies. Sometimes the stone is unstained all over the area of the figure, but surrounded by a broad, dark smudge; and in other cases the reverse is found, the area of the figures being indicated by a uniform dark tint, whilst the surrounding stone is unstained. Friends of Mr. Croft, who can be trusted for their authentic evidence, give two remarkably interesting cases of breath-figures of this permanent description. The plate-glass window of a hotel in London has on the inside a screen of ground glass lying near, but not touching; upon the latter are the words "Coffee Room" in clear, unfrosted letters. When the screen was taken away the words were left plainly visible on the window, and no washing would remove them. A house in London had been a hotel three years before; on one of the windows had been a brown gauze blind, with the gilt letters "Coffee Room" on it. On misty days the words "Coffee Room" are distinctly seen, but not on other days. This is a marvellously accurate instance of permanent breath-figures, the mist acting like the breath, depositing the moisture on the glass. There is no doubt that a little observation on the part of our readers would reveal many curiosities of this kind in old houses, or at railway-stations.

No one, as yet, has clearly explained how these impressions are produced by electricity and heat. The fact always confronts us that the simpler the phenomena the more difficult is the explanation.

DR. J. G. MCPHERSON, in *Knowledge*.

RECENT LANTERN PATENT.

PATENT COMPLETED.

IMPROVEMENTS IN SLIDE-CARRIERS AND APPARATUS FOR OPTICAL OR MAGIC LANTERNS.

No. 20,181. GEORGE DAVENPORT, 19, John-street, Adelphi, London, W.C. *May* 4, 1895.

THIS invention consists of a contrivance, as described below, for producing on a screen, by means of an optical lantern, the effect of a rising and falling curtain, in combination with a panoramic or other carrier or slide frame for exhibiting and changing lantern slides or transparencies.

Any carrier or frame may be employed, but by preference I use a panoramic or "push-through" form, about thirteen inches long, so that it will hold four slides $3\frac{1}{4} \times 3\frac{1}{4}$ at the same time.

In the lower part of the carrier or frame, under that portion which, when in position in the lantern, is in front of the condenser, I insert or let in a roller of metal or other material, running in bearings. On this roller is wound a blind or curtain of silk or other material, of such dimensions that, when unwound, it will cover over the space in the carrier or frame through which the light from the condenser passes to the screen.

One end of this blind is fastened to the roller, and the other end is attached to a lath or strip of metal or other material, which helps to keep the blind stretched, and is provided with holes or other means for the attachment of the cords by which the blind is moved. In the upper part of the frame or carrier is cut a groove, in which a rod or runner works. In the cover of this groove at one end a slot is cut, and through this slot a stud or handle is fastened to the end of the rod, by means of which the rod is moved to and fro; but other means may be employed for working the rod.

To this rod the ends of two cords of silk, wire, or other material, are attached. These cords pass through or over guides, and are wound (one on each side) on the roller carrying the blind. They then pass to the opposite side of the carrier, and are attached to or pass through holes or other contrivances in the lath or metal strip of the blind, and are then carried up and fastened to the rod or runner before mentioned, on the side opposite to that to which the other ends of the cords are attached.

The action of the blind or curtain is as follows:—

When the rod is pushed along in one direction, it draws the cords along with it. These cords are fixed to the rod in such position that those on one side move away from the blind when the rod is pushed along, while the cords on the other side approach nearer to the blind during the same movement. The cords in their movement over the roller cause it to revolve and unwind the blind. The cords, by their attachment to the lath or metal strip of the blind, carry the blind with them as it unrolls, so that it covers the space in front of the condenser and obscures the light, producing on the screen, when focussed by the lantern lens, the effect of a falling curtain. On withdrawing the rod or runner, the movements are reversed, the curtain falls, and is rewound on its roller, producing on the screen the effect of a rising curtain. In the interval between the falling and rising of the curtain on the screen, the slides or transparencies are changed or pushed along by hand in the usual manner.

In place of the above rod or runner for moving the blind, I employ, if necessary, a rod, cylinder, or tube, revolving in the upper part of the carrier or frame, to which the cords for moving the blind are attached or wound. Or the blind roller itself may form part of a rod or tube which is revolved by a handle or other contrivance, the cords being attached to the lath of the blind, and passing through guides or over a roller on the upper part of the carrier or frame, and back on the same or opposite side to the blind roller and the lath or metal strip. Other means may also be used for actuating the blind.

The movement for producing the curtain effect, when attached to a slide-carrier, being independent of the movement for changing the slides, allows of the carrier being used and the slides changed with or without the curtain effect as desired.

The roller blind and the arrangements for actuating it may be fastened to a frame separate from that carrying the slides, if desired, or may be attached to the body or front of the lantern itself.

The claims are:—1. The method of producing on a screen, with the aid of an optical or magic lantern, the effect of a rising and descending curtain by means of a blind or curtain wound on a roller, which revolves in bearings attached to, or forming part of, a frame or carrier which can be placed in the stage of the lantern. The blind or curtain being raised or lowered by means of cords attached by their one ends to the blind and blind roller, and having their other ends fastened to a rod or runner working in a groove or guides in the frame or carrier, and so arranged that, on sliding the rod or runner backwards or forwards, the blind may be raised or lowered in the manner described above. 2. The use of a revolving rod or tube in place of the sliding rod or runner for raising and lowering the blind or curtain, in the manner described above; or the method of arranging the cords attached to the blind lath over guides, and fastening their ends to the blind roller, and causing the latter to revolve, and the curtain to be unwound and wound on its roller in the manner before mentioned. 3. The combination of the arrangement described in claim 1 or claim 2, with a "panoramic" or other slide carrier for holding, exhibiting, and changing slides or transparencies in an optical or magic lantern. 4. The application of the arrangement of blind, roller, and sliding rod, and attached or connecting cords, or other movements described in claim 1 and claim 2, to the body or front of the lantern itself, instead of to a separate frame or to a slide-carrier.

MONTHLY SUPPLEMENT

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THE LANTERN RECORD.

CONTENTS.

	Page
THE SEARCH LIGHT. By RADIANT....	49
LANTERN MEMS. By G. R. BAKER	50
THE ELECTRIC LIGHT IN THE OPTICAL LANTERN. By C. HIGGS..	50
BINOCULAR PHOTO-MICROGRAPHY. By HON. A. A. ADEE, A.M.....	51
LANTERN SLIDES. By JOSEPH COTTIER.....	53
CYLINDER EXPLOSIONS	53
ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES. By JOHN H. JANEWAY	54
THE KODAK INSIDE THE GREAT PYRAMID. By R. MacINNES.....	56
PHOTOGRAPHS AND LANTERN SLIDES AND PHOTOGRAPHS OF LIFE MODELS	56
CHADWICK'S STEREOSCOPIC HAND-AND-STAND CAMERA	56
APTUS MUSEUM STAND AND CAMERA	56

THE SEARCH LIGHT.

My newest fad is fishing. There lies before me, as I write, a card which officially certifies that Mr. "Radiant," of the "Rippling Stream" Angling Society, is a member of the Angling Association. The card is impressed with the official seals of six railway companies: the Brighton, South Western, South Eastern, Midland, North Western, and Great Eastern, and it entitles the holder, when carrying his fishing-rod and tackle, to *half-price* railway tickets to and from numerous places served by the companies named. A list of these places, together with much other information likely to be useful to anglers, is contained in *The Angler's Guide*, the official handbook of the Association. There is, of course, no regulation forbidding the angler, when undertaking one of these privileged journeys, also carrying a camera, so that the combination of photography and the gentle craft is not only permissible, but also highly desirable, from a financial point of view. I am acquainted with several photographers who are also anglers. They seldom catch anything, and their photographic efforts usually meet with the like measure of success. But what matters that? They revel in the pleasant privilege of travelling at half price, and are satisfied. There is no reason, therefore, why photographers should not enjoy the same concessions, in the matter of railway fares, as anglers; but they must be anglers first. The necessary initial outlay is so small, that it may be wiped out by the saving on the railway ticket for the first two or three journeys undertaken.

* * * * *

The London correspondent of *The Journal of the Photographic Society of India*, in his last communication to that excellent periodical, has some practical notes on stereoscopic work, in which he glances at one or two of the methods available for taking the two dissimilar views that are necessary by moving the camera from side to side. His object was "to demonstrate that costly duplicated apparatus was not a *sine quâ non*." The extra cost of an additional lens, a septum and a shutter, to the possessor of a half-plate outfit, may often be a serious point; but, once the outlay has been made, it is seldom that it is regretted, on account of the abiding satisfaction which stereoscopic work usually creates and sustains.

* * * * *

But a little more experience of stereoscopic work will teach the writer in the Indian *Journal* that, however useful as makeshifts these one-lens systems of stereoscopy may be, they are limited in practical value. Such advice as the following—"With an ordinary camera, *in the great majority of subjects*, stereoscopy can be quite successfully achieved by means of some such adaptations as those suggested" (my italics)—is most misleading, the only subjects which, generally speaking, can be successfully treated by the methods he suggests being those such as architecture or interiors, from which movement is absent.

* * * * *

Furthermore, I must be allowed to dissent from the propositions laid down in the following remarks. "Too much stress," he says, "has been laid upon the necessity of taking the views immediately after one another (failing simultaneous exposure), and of equal development, &c., of the negatives. The essential feature is a different but correlated point of view for each picture; and other slight variations between the negatives by no means diminish, but rather, in our opinion, add to the special pictorial and atmospheric effect which gives such views their charm." Now, it is obvious that the less time that is allowed to elapse between the two exposures required by the monocular method of working, the less likelihood there is of there being any error of exposure, so that the stress laid upon the necessity of taking the views immediately after one another is by no means misplaced. Again, to discount the value of good development of the negatives, as he appears to do, is not sound stereography; such advice may be summarily dismissed as proclaiming its own worthlessness. Finally, as to the theory that "slight variations" between the two negatives "add to the special pictorial and atmospheric effect which gives such views their charm," I can only characterise it as utterly inapplicable to stereoscopic work, for which, well-defined, soft, and technically flawless negatives are essential. The writer must pardon me for remarking that he does not appear to have much practical acquaintance with stereoscopic photography, otherwise he could hardly allow himself to write so loosely about it as he has done.

* * * * *

The report of the committee appointed by Mr. Asquith to inquire into the manufacture, filling, and use of gas cylinders is being awaited with great interest in the lantern world. It is to be hoped that it will be made public well in advance of the commencement of the lantern season, for it is undoubtedly the case that those interested in the preparation, use, and handling of compressed gas are in a state of considerable doubt and uncertainty as to the extent business is likely to be interfered with next autumn and winter by the effects of the recent scare. The railway companies in particular appear, if I am correctly informed, to be hedging round the transmission of gas cylinders by rail with conditions and regulations of a nature so irksome and stringent as to argue the existence of a great deal of unreasoning alarm over the matter.

* * * * *

Comment is made on the omission from Mr. Asquith's committee of "practical" men—cylinder-makers, compressors, lanternists, &c., but I do not think this a source of weakness to the committee, which is composed of well-known men of science, such as Prof. Boys, Prof. Dixon, and Dr. Dupré, in whom the public may have

every confidence. After all, the committee will doubtless find that one of the greatest aids to their investigation will be a little common sense, which, if I am not mistaken, will lead them to the conclusion that, having regard to the enormous number of cylinders in use, the fact that so few accidents have occurred is a strong point in favour of the compressing and filling system in present vogue.

* * * * *

A SERIES of lantern entertainments is to form one of the attractions of the Royal Aquarium Photographic Exhibition, which opens on July 11. RADIANT.

LANTERN MEMS.

IN June and July one's thoughts naturally turn more to picture-making than picture projections, for they are months for out-door rather than indoor work in the regular way, and certainly this year the early summer has been perfect for landscape and other photography. Armed with a good, or even moderately good, hand camera, the lanternist that moves about at all cannot fail to obtain subjects that will be interesting when made into lantern slides.

* * * * *

HAVING tried several hand cameras lately on different classes of subjects, with more or less success, I cannot help thinking a want has still to be met in the way of a moderately light hand camera, that shall be capable of use with a fairly long-focus lens (or tele-photographic), say of ten or twelve inches focus, and also answer perfectly with a rapid rectilinear lens of five to six inches focus. This was brought forcibly home to me on a trip down the river from Blackfriars to Sheerness, and up the Medway to Rochester. The photographs taken from the steamer of objects of interest on either shore were so dwarfed and insignificant as to lose much of their charm, notwithstanding they were taken by a first-class hand camera of orthodox pattern, with an A 1 lens.

* * * * *

THE steamer in question was a private one, and went a fair course, in fact much the same as one would expect a vessel to do on entering a foreign river and port, not so well known as the Thames and London, and therefore the deduction seems logical that, if I can find fault with the results in my own case, I feel sure many another in their travelling on a waterway must find the same sort of difficulty. While I write it comes to my mind that some negatives I have seen taken off Gibraltar, Cyprus, and other Mediterranean places of interest fail to result in good pictures, on account of want of size or boldness. Then, again, cricket matches and sports, that of necessity take place at a distance from the spectators, fail to give satisfactory results when photographed by short-focus cameras.

* * * * *

I DON'T pretend to be a photographer, but, having had so many thousands of lantern slides through my hands, I can appreciate and admire a good one, and feel competent to pass an adverse criticism where necessary, and so, having found fault with my own productions, which I think can be fairly said to be as passable as circumstances permitted them to be, look about for a reason for their not being better, and so am driven into a corner, and "find fault with my tools."

* * * * *

As I understand that over 130 hand cameras have been reviewed in one journal only, no one will say there is not enough choice, as far as numbers go, for the most exacting, and, although I don't know one-tenth of the number to speak fully of their merits, it seems very remarkable that no camera should be known to me, mixed up as I am with the optical world, that entirely meets the case of a lanternist when photographing, who not only wishes to record an impression of some beautiful scene, or reproduce some historical building or fine architecture, but also at the same time have power to photograph, in a way that shall have technical value, things that may be of special interest, such as bridges, viaducts, engineering works, vessels, like men-of-war and large steamers, that one cannot approach very closely.

I AM, perhaps, scarcely correct in saying that I know of no hand camera to meet this requirement, for I have seen one that a gentleman dodged up himself from a commercial model that can be used with two different focus lenses, which are interchangeable quickly, and can be carried in the box forming the camera; but what I should like to see is an instrument not so long as the "Naturalist," with tele-photographic lens, and yet longer than the regular pattern hand cameras, and self-contained, without extending flaps or projections that might prevent steady holding.

* * * * *

ARE blow-through jets to be used more next season? This is a question that crops up now in consequence of difficulties being put in the way of transport of gas cylinders, and, if it comes to making one's own oxygen gas again (which, however, I don't think is at all likely), it will be as well, where house gas is available, and one has only to arrange for a holder or bag for the other gas (oxygen), to provide a jet that shall give a good light. This can be obtained with what is known as a "separate" gas, or blow-through, jet, if well made.

* * * * *

NEVER under any circumstances can these give as powerful a light as a first-class mixed gas jet made to suit high pressures, as obtained from compressed gas in cylinders, but it may give, if the jet is properly constructed, a good and useful light. All who have had to do with apparatus have known for years past that there are blow-through jets *and* blow-through jets, but it was reserved for the members of the Lantern Society to be shown by ocular demonstration that one blow-through jet that could be bought in trade and to outward appearance not very different to another, gave a light little more than half of a properly constructed and carefully tested one.

* * * * *

IT will be interesting to test, under a pressure such as one can depend on as an average house pressure, the various forms of separate or blow-through jets, viz., (1) the hydrogen pipe quite distinct from the oxygen right through, and so bent that the oxygen gas blows across the opening on to the lime; (2) with the oxygen pipe turned into the hydrogen, so that the nipple is below the outlet of the house gas; (3) the same kind with telescopic nipple, so as to bring it nearer to or further from the end of hydrogen outlet tube; (4) injector or other recent forms of jet for using house gas direct from main supply and oxygen under pressure.

* * * * *

THE result of the deliberations of the committee now sitting with reference to compressed gas will be anxiously looked forward to by lanternists and the trade, and it is sincerely to be hoped that the modified arrangement and special attention given to testing and filling cylinders will commend itself to the well-known professors and experts composing the committee. One thing is quite certain, that the desire is to exhaust the subject thoroughly, and place the matter on a sound basis, not only for the safety of the public, but also the user. The members of the committee are far too practical with their scientific knowledge to place restrictions that will in any way hamper what has gradually grown up to be a large industry. Now is not the time to speculate on what changes, if any, will be made, and so one must have patience, and wait the publication of the result of their inquiry and recommendations for the Home Secretary's guidance. The committee have already examined one of the oxygen compression works, and, in all probability, were as satisfied with the precautions taken in testing and filling, and the generally excellent arrangement for carrying on the industry as I was when I had the privilege and pleasure of going over the works. G. R. BAKER.

THE ELECTRIC LIGHT IN THE OPTICAL LANTERN.

IN the universal popularity of electricity as an illuminating agent, its application to optical projection will, no doubt, engage the attention of many lanternists during next season, and those having at their disposal a supply of current may, before purchasing any of the excellent apparatus now on the market, desire to experiment as to the suitability of the light to their particular requirements.

It is, of course, not to be recommended that any one should

attempt to run the electric light without some previous knowledge of the subject, but such knowledge is not now so exceptional as in former days, when to most people electricity was but a term to be associated with the "shocking coil" and the "Leyden jar," and experimental apparatus on the lines suggested may be useful as giving in a rough-and-ready way a better idea of the principles involved than if the more expensive instruments were purchased in the first instance. It should, however, be distinctly understood that in ordinary practice the proper appliances as sanctioned by the Fire Offices and the supply companies must only be used.

The laws which govern the supply and consumption of electricity are better explained in the text-books than is possible in these columns; and, indeed, for the present purpose, it is only necessary to remember that with a given resistance (*ohms*) the quantity of current (*ampères*) passing at any one time is in direct proportion to the pressure (*volts*). As some guide, it may be mentioned that with carbon pencils of about seven or eight millimetres diameter, a current of four or five ampères at fifty to fifty-five volts will give a light suitable for average lantern work. The question whether the current is "alternating" or "continuous" is not of any great moment; on an alternating current the carbons burn equally, the arc gradually working round the sides of their points and burning with a humming noise; while with a continuous current a crater is formed on the positive carbon, which is consumed at a much greater rate than the pointed or negative one, the arc being practically silent and steady.

The lamp itself need not be of elaborate construction, and may very well be made of dry and varnished mahogany. To form an arc, the carbon pencils must be placed with two of their points separated some quarter of an inch or more, and any simple arrangement of a base, upright, and arms to support the carbons vertically, and which electrically insulates the two from each other and from surrounding metal work, will answer the purpose. For facility in obtaining the focus, there should be some means of adjusting the distance between the carbon points, and of raising or lowering the whole. To start the lamp, the two carbons should be approached until just touching, and immediately separated.

Safety fuses of thin lead or tin wire, of a number of strands just sufficient to carry the current required without appreciably heating, and no more, should be put in circuit on both of the supply cables. This precaution will minimise any danger arising from "short-circuiting" due to mechanical defects in the apparatus.

If a "resistance" is required, some incandescent lamp-holders can be connected in parallel, *i.e.*, with all the leading wires and all the return wires joined together in two bunches; one cable to be cut and each end joined to one of the bunches. The resistance can then be varied by inserting lamps of the full voltage of the circuit—the greater the number of lamps and the higher their candle power the less the resistance, and *vice versâ*. A resistance must always be used where the supply is taken from the street mains or in any case where the pressure exceeds the amount required for the arc lamp, viz., fifty to fifty-five volts.

In dealing with electricity for lighting purposes, it must not be forgotten that it is an agent capable of generating the most intense heat in any conducting substance which partially opposes its passage, but which at the same time does not give warning by smell or sound of escape or imperfect connexion, and care must be continually exercised that there is *metallic* connexion at every joint, and that the whole of the wires, fittings, and lamp are thoroughly protected from damp and from contact with any other metal work.

Finally, it should be a rule, especially when using an alternating current, never to touch both carbons, or two or more pieces of metal or bare wire with either hand, and never to use both hands for such a purpose at one time, unless the current is completely switched off. Attention to this simple rule will save many a shock, which, if not absolutely harmful, may be far from reassuring to either operator or audience.

C. Higgs.

BINOCULAR PHOTO-MICROGRAPHY.

[Photographic Times.]

As the photographic enthusiast cannot truthfully say that he has fathomed the deeper enjoyments of his art until he has invoked the aid of the stereoscopic camera, to fix in solid perspective and relief the scenes of travel and the character phases of the life around him, so the microscopic student falls short of one of the most valuable adjuncts to research who has not habitually employed the binocular and with its help seen his infinitely little world, bounded by its hither and nether walls of crystal, in perfect solidness, as though viewing its varied forms imbedded in a block of ice like the fishes and flower wreaths sometimes displayed outside a restaurant or shop by way of advertising the wares within. It is much to the discredit of our students that so few binocular microscopes are made and sold in this country. In England they are constantly used, and by no other means can an equally positive idea be formed of the structure of the lower forms of infusorial and vegetable existence.

The principle of the binocular microscope is simple. It is easily demonstrable that the wide pencil of rays collected by an objective in close proximity to the object viewed comes aslant from all points except the axis of the field of view; that these slantwise rays come from different planes of the object; and that the objective, by getting very close to the object and squinting (so to speak) into and through it at various angles, forms a general impression of the whole which it projects along its optical axis up the body tube. If we stop down the angle of the objective, by a perforated diaphragm immediately behind it or by a perforated cap in front, the aperture of either being central, the axis of projection coincides with the optical axis of the lens system. If, however, the aperture of this rear diaphragm or front cap be moved to one side, the lens still transmits a picture of the whole object, although the axis of projection is no longer central in a continuous right line, but eccentric, following the centre of the aperture and bent slightly aside at that spot. A new point of view is in fact given to the objective, to one side or the other of the original axis, and its capacity for lateral and slantwise vision into the various planes of the object from this new view point is consequently increased. If now, instead of an excentered circular stop, a half-moon aperture be placed either behind or in front, the result is the same, the axis of incidence and projection being correspondingly displaced. When this half-moon stop is so arranged as to cover up first one lateral semicircle and then the other, the image is seen under different angles of obliquity, much as when a solid object of larger size is looked at with the right and left eye alternately closed. This refractive property of the objective is utilised in the binocular microscope by placing a prism close to the back glass so as to cut the field in two and project half of the image-forming pencil slantwise across the main beam and up a second tube fixed beside the body tube. Each eye thus receives an image of the whole object, but formed at a different angle, and the combination of the two by the unconscious habit of normal vision produces a true stereoscopic impression. Were each tube of the binocular prolonged and a camera attached, two pictures could be taken, each representing the object as seen by the respective eye, and the blending of the two by means of a stereoscope would give the illusion of dual vision.

The same result can be more simply attained by using the ordinary monocular tube and camera, covering up alternate semicircles at the back or front of the objective, and taking two successive negatives of the subject. This method has been often practised with fairly good results when moderately low powers are used. One of the earliest practical experimenters in this field, Dr. William C. Borden, of the United States Army, contributed a paper to the *American Microscopical Journal* (vol. xiv. 1893, page 329), in which he described this way of obtaining stereoscopic photo-micrographs, and detailed the conditions necessary to success and the difficulties in the way of realising them. The chief obstacle is the almost impossibility of getting a perfectly uniform illumination of the field which shall subsist unchanged when the semicircular diaphragm is shifted. It is easy to obtain an even disk with either half aperture, but, on making the change, the other half commonly shows up in partial shadow, and sometimes as a background effect with the object standing out whitely illuminated. Only a very small field can be evenly lighted. Altering the illumination brings a host of diffraction phenomena into effect, so that the identity of the optical images is lost. Again, this method is only capable of exact application with medium powers, for it is demonstrable that each alternate half of the projected image-forming pencil shows the subject as the objective sees it at close range, that is, under oblique illumination from opposite sides. Very simple observation will satisfy any one that oblique illumination alters the apparent position of points in different planes, and that this distortion increases with the shorter focus and wider aperture of the higher powers. A fine filament or speck, not in perfect focus under a one-fifth lens, may be made to shift its position well across the field of view by altering the oblique illumination from left to right. It thus stands to reason that, if the two pictures so obtained be stereoscopically combined, the result is genuine binocular vision by refraction, *plus* an exaggerated displacement of the different planes due to diffraction.

Dr. Borden seems to have warily discerned these stumbling-blocks, and turned his attention to other methods of obtaining binocular photographs of microscopic subjects under unchanged conditions of central illumination and with unimpaired performance of the objec-

tive. The purpose being to imitate the human eye as closely as possible in its way of doing business, that is, to get two views of the same object under identical circumstances, but from points laterally separated by a space equivalent, so far as the effect is concerned, to the distance that ordinarily separates the pupils of the eyes, he adopted the expedient of tilting the object on the stage of the microscope, and this he rightly calls "the one preferably to be adopted whenever practicable." Looking downward at a plane object lying perpendicularly under the nose, it is clear that the right eye sees it as though it were tilted slightly to the left, and the left eye sees it with an equal tilt in the opposite direction. When the object itself is physically tilted on the stage, the solitary cyclops eye of the microscope sees it alternately from the points where its right and left eyes would be if it had them. This mechanical way of obtaining binocular vision is essentially dioptric, and so wholly different from the method of the Wenham prism which depends on the refractive, and, to some extent, diffractive, properties of the microscopic objective, which does something the eye never dreamed of doing by collecting a wide cone of rays from an object at very short range and projecting it as a nearly parallel beam up the body tube. Could the tilting system be broken into steady work, its results would be almost entirely independent of the optical idiosyncrasies of the lens, and afford a fairly satisfactory means of viewing the magnified object in its true binocular aspects.

I have not had the good fortune to get sight of the mechanical device by which Dr. Borden tilts his slide and takes his views. As he speaks of "focussing after tilting the slide," I infer that some necessary readjustment follows the taking of the first picture in order to get the object properly centered if the tilt has disturbed its position, and to get a fresh focus as nearly as possible identical with that of the first position. Whatever his way of working, his results have attracted much attention in the microscopical world, and that grave body, the Royal Microscopical Society of London, discussed them in a meeting reported in the journal for April, 1894, and recorded its admiration of a fine stereoscopic picture of an injected section of the muscle of a cat, of which I am happy to possess a copy, thanks to the Doctor's kindness. There is no question that the stereoscopic illusion is properly and strikingly rendered, the tiny capillaries are seen interlaced and superposed in a transparent bed nearly an inch in apparent thickness.

Moved by a natural emulation, I hastened to essay the system pointed out by Dr. Borden, after having tried and abandoned an ingenious little device, a sliding shutter behind the objective, intended to reach binocular effects by the diffractive paths. Setting one margin of the slide against a transverse ledge on the microscope stage, a bit of cork one-sixteenth inch thick set under the other margin supplied the needful tilt. The difficulties of adjustment for the alternate views soon became apparent, and especially the botheration of getting a new focus even approximately identical with the first. My results were encouraging, in that they were almost, but not quite, stereoscopic. I soon became convinced that some mechanical device was required, which should work automatically so that the second view could be taken without alteration of the focus or any other permanent condition. I reasoned that the axis of "tiltation" must run up and down the centre of the photographic field exactly bisecting it, and that it must, furthermore, lie wholly in the plane of the object, so that, when the slide was tilted, a focussed point in the central meridian would still remain central and in focus. These conditions being fulfilled, it would be possible, in theory, after taking the first view from the right-eye point, to simply tilt the slide, insert a fresh plate, and make the second exposure without renewed examination.

It does, in fact, so work in practice, although the tilting stage I have devised and built is not as solid in construction nor as accurate in its alignments as it will, doubtless, be when some professional microscope-maker works out the design in enduring brass and steel. Briefly, it consists of a circular stage, three and a quarter inches in diameter, mounted on two pivots, the axis of which passes through its under plane. A generous central opening and spring clips on its under side permit the slide to be secured thereon face upward, thus achieving the most essential condition of having the axis of oscillation lie in the superior plane of the slide, or, rather, a few microns above it, so as to traverse the centre of an ordinarily thin section or other subject. This tilting stage works in raised bearings on a plate which clamps firmly to the stage of the microscope, the axis of the bearings being perpendicular to the field of view. By removing the tilting stage and stretching a fine thread between the bearings, the axis of oscillation is focussed on the thread and centered in the field so as to exactly bisect it. When the slide is adjusted on the tilting stage and the latter set in its pivotal bearings (the thread having, of course, been removed), the object is found to be closely in focus, and a sharp definition on the central perpendicular zone is readily obtained. After this, tilting the stage to either side does not appreciably disturb the focus on the axial line. The definition necessarily falls off a bit toward either side, but this does not impair the subsequent stereoscopic effect, for the indistinct part of one picture is sharper in the other if the focussing has been rightly managed, and, as Dr. Borden points out, "full relief and sharpness are obtained in the combined image even if one of the pictures is blurred and indistinct," inasmuch as "the sharp outlines of the good picture will override the somewhat blurred outlines of the poorer one, while the combination of the two produces the impression of relief."

Two stopscrews beneath the tilting stage on either side enable the amount of the tilt to be adjusted. The angle of the tilt is, curiously, much less than the angle at which the slide would be viewed by the right and left eye alternately at the normal distance of ten inches, which, with an average pair of eyes, is about fifteen degrees. The objective, on the contrary, sees the object at a distance of an inch or less, and, moreover, collects a visual cone of much wider angle. The result is that the angle of the tilt is exaggerated in projection, and the amount of inclination to be given to the slide seems to be governed directly by the angular aperture of the objective, and to a lesser degree by the focal distance at which the picture is photographed, that is, by the excess of amplification of the image over the initial magnification yielded by the objective at ten inches. I have not yet attempted to figure out the problem. By empirical trials I find that with a one-inch objective of ·20 numerical aperture, and a camera draw of thirty-six inches, the tilt should be between three and four degrees, to give a natural relief under the stereoscope. With higher powers, or when a projection eyepiece is used to increase the amplification, the angle of tilt is less.

The utility of this mechanical process of obtaining binocular photographs is perforce limited by the working distance of the objective, for there must be space enough to allow the object to be inclined without smashing the cover glass, or, worse still, ruining the lens. I have taken encouraging views with a one-fifth of generous frontal distance and a Zeiss No. 4 projection eyepiece, but I have yet much to learn about this use of the higher powers.

A good many little details must be attended to in order to get satisfactory pictures that will blend with natural relief. It is, for instance, important to bring out the two negatives with equal printing density. Developing the plates in succession in the same bath involves two sources of inequality, the difficulty of arresting the process at the right moment, and the circumstance that the second development works slower and gives a trifle more contrast. This really don't make much difference, for the stereoscope is able to combine into fairly good illusiveness pictures of notable difference in depth and tone; but it is preferable to have them as much alike as possible. As to the negatives, I now accomplish this by developing two 4×5 plates side by side in an 8×10 tray, thus getting identical depth barring the slight difference due to the varying thickness of the emulsion film in plates from the same box. Even this slight discrepancy may be obviated when Carbutt's orthochromatic plates are used, for, as they are now packed, each folded pair forms practically one plate cut down the middle, and the separated halves may be taken for the paired negatives. Printing and toning ought also to be done in pairs under identical conditions, and with the utmost care. In mounting the paired prints, when no eyepiece has been used, the image is inverted as in an ordinary view camera, so that the right-eye print goes on the left of the card and *vice versâ*; but, when an eyepiece is employed, the image is erected, and the mounting order must be reversed.

After all, however, the most essential condition to success lies in the choice of the subject, which should be strongly marked in some such way as to naturally suggest perspective, and so eke out the stereoscopic illusion. A stereograph of an egg, for instance, is materially fortified by the knowledge that it *is* an egg, and it is astonishing how much the illusion is helped when one knows what he is to look for—a fact which, by the way, pervades the whole range of microscopical research. I have recently been made happy by hitting on a peculiarly suitable subject—the gizzard of the common house cricket. This singular organ is studded with horny finger-branched processes that stand up at a wide angle from the basal membrane. Their saliency is recognisable even in an ordinary photomicrograph. One can but envy the digestive powers of a creature so well equipped with food-grinding appliances. My good friend, the editor, has most considerately reproduced my stereograph of this remarkable object. That it produces by combination of the dual images a true stereoscopic illusion is evident on the merest inspection; and it is, moreover patent, to the most casual observer that, as

was remarked by a friend to whom I showed this print, such as an animal ought to be capable of lasting through as many three seasons of Washington dinners. HON. A. A. ADEE, A.M.

LANTERN SLIDES.

(Anthony's International Annual.)

I PROPOSE to go over some generally neglected but fertile ground, the improvement of slides of questionable success. I mean, of course, slides in which the poor result is due to the negative, for otherwise it will be far easier to remake the slide.

The general advice given by experts is not to try to make a lantern slide from a poor negative, but to take the negative over again. It is very good advice for such as can follow it, but most amateurs, having very little time to devote to photography in the daytime, find it hard to duplicate an unsuccessful negative, however much a lantern slide of the subject may be desired.

A very common disease of negatives is "weakness" and general debility, although plenty of detail exists; the plate has probably been over-exposed and under-developed.

If of the right size for a contact print, a very representable slide can be made in the following manner: Make two slides, as nearly duplicate as possible; develop to get all the detail, but stop development before there is the slightest fog in the high lights.

If the development has been judicious, you now have two nearly similar slides clear, but not more than half the required density.

Select that slide which has the more correctly placed image, and number it No. 1; call the second No. 2. Place No. 1 film up, on a piece of ground glass so placed that the light passes up through it; place No. 2, also film up, on No. 1, so that the pictures will register as you look through; No. 2 will have to be trimmed on two edges, as two of these will project beyond No. 1. Trim a trifle more than is just sufficient. Mat No. 1, on the film side, and fasten the mat in position by paste or mucilage; care must be taken that, when No. 2 is placed on No. 1, and registered, the trimmed edge of the former does not show inside the mat. As soon as the paste has set, and the mat is firmly fixed to No. 1, place this slide on the previously mentioned ground glass, film up, wet the outer edges of the mat with mucilage, and place No. 2, also film up, on the first slide, being careful that the two images register exactly, as you look through in a direction perpendicular to the plane of the slides. When it has firmly set in this position, cover the whole with an ordinary cover glass and mount.

The result will be a compound slide, consisting of two films of the same thing separated by one thickness of glass, and accurately registering, and of a cover glass. When put in the lantern, No. 1, nearer the lens, will be in focus on the screen; No. 2, a little further off, will not be quite in focus, and its main object is to screen off some of the light from those portions of the first film, which would otherwise receive too much.

If the slides were separately only one-half the necessary density, the resultant picture will show up to perfection, and will, moreover, have extra softness, due to the influence of the back film, which, however, does not blur the image, owing to its being slightly out of focus.

Besides the negative which is too weak, there is the negative which is too dense in parts, giving blank spaces in an otherwise good slide; this is notably the case when there are mountains in the distance or sun rays striking through the foliage.

This evil can be counteracted by retouching with pencil directly on the film, and it is wonderful how little noticeable the pencil marks are on the screen, even when attention is called to it and the work is the work of a tyro, providing the effects have been produced by stippling or short strokes of the pencil and not by long strokes.

I had considerable difficulty in getting the necessary "tooth" with a preparation that had been sold to me for the purpose, and, not having time to go to New York to get some retouching fluid from a more reliable dealer, I experimented with the following method, and have had such success that I counsel a trial thereof by those who may not have been successful with the old method. Naturally, it is of as much value for negatives as for slides.

The plate should preferably have been soaked in alum, or some other hardening solution. Now pour a little heap of any hard, finely powdered substance on the plate, and, with the finger or with a pad, rub it over the film, with a slight circular motion, so as to thoroughly roughen the same. As soon as an even matt surface has been obtained, and the powder dusted off, the plate will take even the hardest pencil with great avidity. As to the powder, I have tried flour emery, but find it to cut too much, and now use firebrick, which has been finely powdered in a mortar.

Of course, in this state, the slide is unfit for use, for on the screen the scratches would show up like trenches; but to eradicate these, and at the same time fix the pencil marks, simply requires the flowing over the film of some good negative varnish or similar concoction, and the scratches vanish before its advance like magic.

About the other methods of improving lantern slides I will not have much to say.

The practice of printing clouds on the cover glass, and mounting the slide and the cover film to film, in order to put clouds in a cloudless sky, is very good, if you do not put sunlit clouds in a sunless landscape, or *vice versâ*; nor put clouds lit from the east in a country seen lit from the west.

Intensification is generally not very profitable unless not much is necessary, in which case good results can be obtained by immersing a well-washed slide in a solution of mercuric chloride until bleached, washing and leaving for some hours in a solution of gold chloride; the resulting plate, besides being intensified, will have changed tone and be of a blue colour exceedingly pleasant to the eye.

Reducing solutions are used for local application, such as clearing up the sky or bringing out the high lights. For this purpose, in a small beaker mix a solution of hypo with a little red prussiate of potash. Taking the still wet plate in the left hand, dip one or two fingers of the right in the reducing solution, and rub them on the spot which needs reducing. Care must be taken to keep the fingers constantly in motion on the plate, and to dip this latter under a tap of running water every now and then, to prevent the solution from getting hold where it is not wanted. When the sky is slightly overcast and needs reducing, hold the plate so that the solution will flow away across the sky, and not across the picture. Do not approach the outlines of the picture until the central portion of the sky is entirely reduced out. Then gradually approach nearer and nearer to the edges of the image, until finally some of the solution is rubbed on the picture; now watch carefully, and at a certain instant it will be found that the sky has completely vanished, although the picture proper has apparently not yet suffered at all; thrust the plate quickly under the tap, to arrest reduction, and then treat the next portion of the sky. After the operation is finished the plate should be well washed in running water. JOSEPH COTTIER.

CYLINDER EXPLOSIONS.

(The Exhibitor, Philadelphia.)

THE recent explosion of a gas bottle in England has caused a deep impression among all who have occasion to use the gas lantern; the alarm in England is widespread because those who use the gases are compelled to handle the bottles with high pressure or go back to the troublesome, and more frequently dangerous, bags. We have watched with interest the investigation that followed the accident; the one peculiarity about this explosion was the fact that it is in evidence that the bottle was not dropped. All former mishaps of this kind have been ascribed to the fact that the material of which the bottle was made was of too brittle a composition, and that a violent jar caused it to fly to pieces. This bottle was lying upon a seat by the side of the man who was killed. The coroner's investigation failed to find any cause, except excessive pressure, for the explosion. Why there was an excessive pressure was not determined; the drift of opinion seemed to be that two gases must have been in the bottle, it was not in evidence that the two gases were pumped into the bottle, in fact the weight of evidence was entirely against that theory.

The presence of oil was suspected; its decomposition would be hastened by the presence of oxygen gas, especially under heavy pressure, and, hydrogen gas formed, the chemical action would generate heat enough to ignite the gases, and the explosion would, of course, follow. Again the weight of evidence was against the oil or grease theory, as, this danger being well known, precaution was taken to prevent it. Is it necessary that the two gases be present to account for this explosion? Would not heat cause an expansion of the oxygen sufficient to destroy the bottle? We are all acquainted with the experiment of spongy platina in which hydrogen gas is absorbed into the pores of the platina so rapidly as to generate sufficient heat to ignite a flame of gas.

Is it possible that fine iron dust and scale partakes of the same properties as spongy platina? It is not reasonable that the cause of the accident referred to developed and consummated the result at the moment of the explosion; it is more reasonable to suspect a cumulative agency, which reached its maximum at the moment of the explosion. An answer to such a question would be that, if it were the result of heat, it would have been noticed by the party carrying the bottle.

Interesting parties in England are endeavouring to allay public apprehension by using the argument always presented in such cases; that is, there are more people that are not killed that way than are killed

that way, and a great many more so, so that the chances are favourable. We do not know what the to-be-killed individual thinks of this argument.

If a bottle will go off on a railway platform, one will go off in the midst of an audience some evening, and then the pressure will be reduced as it should be now, or some one will go out of the business as they did in the United States.

Why not adhere to our old, well-tried pressure of about 200 pounds, a plan that has worked for nearly forty years without a single accident of the kind referred to? true, the bottles or tanks are more bulky, and it costs a little more to transport them, but what if they are? And what if the cost is a little more? Is it not better to spend a little more money than to have such an accident as may happen in the midst of a large audience?

ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES.*

Electric Light.—The electric light is furnished either by pile (battery) or machines called dynamos. In the first, electricity is produced by a chemical reaction; in the second the energy force is converted into electrical energy. This is not the time to make a study of these two marked and distinct methods of lighting.

The Incandescent and the Arc.—The incandescent light is very rich in yellow and red rays, where carbon filaments are used, and has therefore, up to a very short time, been considered not adapted to photographic applications, whilst those with platinum filaments, such as are used in the Lontin system, give a highly actinic light but are very expensive. As we shall see later, experiments made and now being made are producing lamps of intense incandescence. It was Sir Humphrey Davy who discovered that, if two pieces of carbon were placed in contact with each other and a current from a battery of sufficient number of elements was passed from one piece to the other, the current did not cease when the carbons were slightly separated, but that the current passed across the intervening space, causing an intensely high temperature and consequently brilliant light; the pieces of carbon gradually burned away, the positive carbon being consumed more rapidly than the negative.

The arc light has been thought greatly superior, from a photographic point of view. It had a better rendering, gave a very extended and complete spectrum. But it has this fault; it is, that if produced in a very narrow space it gives rise to hard effects—very great high lights, very deep shadows, and without those half-tones which model and give softness to the form. As a consequence of the first experiments, which date back to 1841, this source of light remained unused because the idea had not been conceived of rendering it practicable, by diffusing it. Nearly twenty years after, Nadar, and much later Liebert, constructed appliances which render it practicable to use this light.

Generators of Electricity.—In the beginning electricity (for lighting), was only produced by aid of chemical reaction, made in an appliance called a pile or battery. In reality, for obtaining the light, the zinc was burned. As at least fifty couples (Bunsen) were required to produce a rather luminous arc, making an enormous pile difficult to manipulate and emitting nitrous vapours unfit for respiration and adding to this the cost of the same, not small by any means at that time, it would seem a sufficient reason why the electric light was but rarely used by photographers. It is claimed that Mr. Henry Wilde was the inventor of the dynamo, but this is, I think, a mistake, and that the credit of invention is due to Pixii, —Wilde announced the principle by which quantities of electricity and magnetism indefinitely large were induced from quantities indefinitely small to which we are in a great measure indebted for the practicability of using the electric light for illuminating purpose, and changes the face of the question.

Now it is cheap coal instead of zinc that is burnt. The apparatus may be placed at a distance from the lamp and be made silent. We see now electricity distributed in cities and towns through pipes, like gas or water.

Electric Regulators.—The mechanisms that are used in producing the arc light are called electric regulators. There are many different patterns existing, but they are all founded upon a common principle. The electric arc is produced between two carbon pencils: at the start, the two carbons are in contact, the current in passing from one to the other, meets with, owing to the imperfect contact of the carbons, a certain resistance, causing a transformation of the electric energy into a caloric energy. The two carbons are then brought to a red heat; if at this moment they are a little separated, an extremely luminous arc leaps from one carbon to another, there is at the same time a carrying off of the incandescent matter, and under this action one becomes hollow and the other pointed. If the current is continued, that is to say, always in the same direction, it soon will be seen that one of the carbons is consumed almost twice as fast as the other. As soon as, by this continuous waste, the interval between these two points has become too great, the arc dies out and the series of operations has to be begun again. The object of the regulators will, therefore, be: 1st, to make sure at the beginning that the carbons are in contact; 2nd, to keep them at the distance which has been recognised as giving the maximum arc; and, finally, to maintain this distance by causing the carbons to move with a rapidity in proportion to their wasting. Though several attempts were made, it was Foucault who made the first rational model. Serrin and many others have brought to bear successive modifications upon this problem with varied success, for only the mechanical parts have as yet been solved. There is also another series besides the arc lamp, of which the Jablochkoff candle is one of the principal type. By very ingenious mechanism a lamp is so constructed that it can act either with continuous or with alternating currents.

We must also mention here the mercury lamp of Way, not only because of its very original method of transforming the electrical energy into light, but also because it had considerable vogue in the photographic world for a short time, which had based upon it great expectations.

This lamp consisted essentially of two iron balls, one of them communicating with the positive pole of a pile of thirty Bunsen elements, the other with the negative pole; a thin jet of mercury falling from the upper sphere into the second became illuminated from the passing of the current, and, to prevent the operator breathing the mercurial vapours produced, the whole was enclosed in a glass cylinder hermetically closed. This light, of a very peculiar aspect, slightly greenish, gave a disconnected spectrum in which the yellow portion had disappeared. The blue and green and violet portions were very brilliant, whilst the red, the orange, and the yellow green were very pale. This *ensemble* formed a very actinic light, and used for printing pictures on albumen greatly hastened the work. It was admitted that on an average five minutes was sufficient for printing an average *cliché*, placed at about eighty centimetres from the luminous source. On the other hand, the monochrome light strangely modified the colours of the objects. The pink tints of the face acquired a livid bluish tint, green objects had a lavender grey colour. This lamp, though well investigated, was very soon abandoned on account of the extremely deleterious mercurial vapours produced. The attempt, however, was curious and deserved to be noticed.

Fourtier says that the electric light was first used for producing photographic prints by Silbmann & Good in 1840.

In a paper read before the Camera Club, London, January 15, 1895, by W. H. Harrison, we find the following: "Photographic micrographers may be interested to learn that the Atlas of the Cours of Microscopy for complimentary medical studies by Al Donnè, published by Bulliere, of Paris, 1845, contains engravings copied from the Daguerreotypes taken with the apparatus of Foucault and Donnè, sometimes with the solar light and sometimes with the light of the electrical arc. As it is known that Foucault's earliest discoveries in electricity were in conjunction with photography as early as 1838, it is fair to believe he had made not only the Daguerreotypes mentioned above, but also prints from the same previous to 1840."

In 1860, Woodbury installed an electrical plant, and printed his photo-relief matrices by electric light, and in the same year Dujardin of Paris obtained chromo-gelatine reliefs by the same light in from twenty seconds to four minutes. Nadar, in 1861, used, in making portraits, a Serris regulator actuated by a pile of fifty Bunsen elements. The apparatus was placed at a height of two metres fifty centimetres above the camera and back of it; it was furnished with a reflector covered with a coating of chalk to diffuse the light. Owing to the height of the luminous point, the sitter was not inconvenienced, but the exposure varied from a minute to a minute and a half.

It is probable that it was a little before 1861, that with a cumbersome pile mounted on wagonetets, Nadar started for the photographic discovery of the Parisian subways, catacombs, and sewers. "With his charming spirit and humour he has told us, in the Paris *Photographe*, the great difficulties he had to contend with in making the marvellous *clichés* that he brought back from this subterranean world, and the sudden extinction of the light at the least imperfect contact, and the exposures stopped by a flow of hot water, whose vapours formed an impenetrable fog. It required the tenacity of Nadar to reach this result, but it must be admitted that it was not a process within the reach . . . of the patience of all."

In 1864, Ost, a Viennese photographer, installed electric light in his atelier for photographic portrait purposes. He illuminated his subjects with two arc lights, one of them furnishing the main illumination generated by a Bunsen battery of eighty elements, the other of less powerful form a battery of but fifty elements, to counteract or to reduce the direct or abrupt shadows cast by the former. This second lamp was smaller, of course, placed at a greater distance from the subject and at a low stand point, the main lamp being about two metres from the floor. Parabolic mirrors reflected the light upon the subject.

In 1869, Brevet Lieut. Col. J. J. Woodward, Assistant Surgeon U.S.A., employed Duboscq's electrical lamps with fifty small Grove elements for photo-micrographical purposes. How well it worked is shown by his results, which are still the admiration of the student. Though Nadar had, above all others, endeavoured to diffuse the light in order to avoid the hardness given by the divided rays, but little if any attempts at using the electrical light in portraiture were made until about 1876 or 1877. The electric light only became endurable and finally popular, when the manufacture of medium-power lights of 200 candle power was undertaken instead of the powerful ones of 4000 candle and over. This statement applies to street lighting as well as photographic portraiture. The modifying of the power for both uses was aimed at in different ways. For stores and streets several lamps are substituted for one, by which means a number of weak lights are obtained instead of one powerful one, and at the same time a considerable loss of power.

* Concluded from page 45.

In photography the modification is obtained in a different way. A broadly spread and diffused light is required, so that the sitter may be treated in an artistic way. Therefore, instead of a number of different lamps from which the light proceeds, a broad surface in the form of a concave reflector is illuminated with one powerful candle power light.

About 1876, Mr. Kurtz, of this city, installed in his studio in the old Post Office building the electrical light for photographic portraiture with unusual success. I know that it is claimed for Van der Weyde of London that he was the first to reintroduce electrical illumination in photography. But Mr. Kurtz has informed me that it was not until after Van der Weyde had visited his studio in this city and had returned to England that he installed the light there. Van der Weyde's method was directly opposite to that which Mr. Kurtz had adopted. Mr. Kurtz, instead of permitting the light to control him, controlled the light, and caused it to be distributed over the sitter at various angles to suit his will. His lights were stationary, or substantially so, and the sitter was moved about underneath them by a contrivance of Mr. Kurtz, consisting of a rotating platform, to which was attached a lever, by means of which the platform was caused to move during exposure within a circle, so as to subject the model to various lightings. The effect of this lighting upon the subject was very beautiful, and possessed the softness and delicacy characteristic of an ivory miniature. Mr. Kurtz used four or more electric lamps suspended from the ceiling in proper places; they were enclosed in rectangular boxes; the fronts were covered with tissue paper, which softened the light and produced in the print what was called a mezzotint, or a soft and ivory-like appearance. The tissue paper was renewed every day. Vogel sums up the principle of Mr. Kurtz's vibratory method of lighting as follows: "Now, just as certain chemical substances are so acted upon by the rays of the sun as to enter into new combinations or to separate entirely into their component parts, so light is acted upon by the effect of motion." As I said before, Van der Weyde's method was directly opposite. Instead of a number of different points, from which the light proceeds, a broad surface in the form of a concave reflector, was illuminated with one powerful 4000 candle-power light. His reflector, semicircular in shape, was made of copper, lined inside with paper and over five feet in diameter. Through its walls were passed the carbon points insulated with rubber tubing and connected by wires to the machine; the regulators for feeding the carbon points were moved by hand; the upper carbon was smaller than the lower one. By a red glazed window the operator was enabled to watch the combustion of the carbons without strain to his eyes, and manipulate them as required. A metal reflector was placed in front of the carbon points, supported by wires to prevent the direct rays from falling upon the sitter, and to throw them back to the reflector. The whole arrangement of Van der Weyde was as follows:—The reflector and light hanging by a sort of fork (capable of motion on a horizontal axis) on a horizontal iron rod, balanced by weights at the right, and turning on an arm let down from the ceiling. The weights hang by chains passing over rollers, and are connected with the reflector and fork. By this means the former may be easily raised or lowered. These two entirely different methods of illuminating the sitter gave rise to a spirited controversy between Mr. Kurtz and Van der Weyde. The *Photographische Wochenblatt*, of Berlin, towards the close of the controversy, made the following remarks:—"Parallel rays, when illuminating a head in three-quarter pose, produce shadows equally abrupt and as sharp as does sunlight. When an absolute rotundity or convexity is to be photographed, parallel rays will do very well and produce a plastic picture. Therefore only diffused light can be used where positive shadows have to be avoided. Mr. Van der Weyde admits that himself, for he says in his closing remarks that, while formerly he had employed a polished reflector, he uses one now not polished, consequently he works with diffused light. A polished parabolic mirror reflects parallel rays. The light is diffused when reflected from a matt surface." The electric light for portraiture now began to be popular, and it was rapidly installed in the photographic studios in London, Berlin, St. Petersburg, Vienna, Munich, Brussels, Paris, Lyons, Lisbon, &c. In all these the arc light was employed for portraiture as well as for reproductive purposes. Lewitzky, of St. Petersburg, installed and used the Van der Weyde light in 1878. S. von Ronzalln, of Berlin, installed electric light in his studio in 1879, using one Siemens Differential lamp of 3000 candle power, and a dynamo driven by an engine of three horse power. The lamp was enclosed in a box resting upon a movable stand with rollers, and revolved around its axis. The light was thrown upon a paper screen, of two metres diameter, from which it was reflected upon the subject to be photographed. He obtained by this arrangement an indirectly but uniformly illuminated space of from two to three metres in diameter. Quantitatively, this method of lighting was claimed to be nearly equal to the light force of diffused daylight, but qualitatively it is said to be exactly the same. The installation of the Portuguese Geographical Institute at Lisbon consisted of a magneto-electric Gramm machine and arc light with Serrins regulators (which is very precise in its action). The force of the electric current generated by a Gramm dynamo is equal to that of a Bunsen battery of sixty elements, and the arc light produced is about equal to 2000 candle power.

May 7, 1884, Mr. G. H. Sherman read a paper before the Chicago Photographic Association in which he stated that he had been much interested with the accounts of the using of the electric light and the results produced at the meeting of the National Photographic Association, the year previous, and described the electrical plant which he had introduced into his studio at Elgin, Ill. The lamp used was one of the Van Dupael lamps, 2000 candle power, suspended from the ceiling near the centre of his reception room. It was arranged with cord and pulley so as to be raised or lowered to any elevation. He used a large ground-glass globe, a circular concave reflecting screen of fine white muslin fixed to a standard and adjustable to any height or angle. This was placed within a foot of the lamp. He had also a mirror 16 × 24 inches, also adjustable screens, &c. On the side next to the lamp he placed a screen of white muslin 7 × 8 feet, in the centre and near the top is an open space 2 × 3 feet, which he filled with one or two thicknesses of blue gauze. This softened and diffused the light. In the centre of the gauze was an oval piece of white tissue paper (sometimes of two thicknesses), which was so arranged as to come directly between the sitter and the bright spark of the lamp. This had also a tendency to diffuse the light. From the top of this side screen projected a screen of the same material over the sitter, and also adjustable to any angle; this, when properly used, gave the combined top and side-light effect. A large screen or reflector, also adjustable, was placed on either side of the sitter. Hand screens or reflectors were used to throw the light in any direction and soften shadows. Ordinary backgrounds, sometimes of unbleached muslin, were used, and, with the aid of the mirror, the whole or any part of the sitter or background is lighted.

Under the name "The American Process" M. Liebert introduced in France the lamp which bears his name, the description of which is given in *La Nature*, December 5, 1887, as follows:—"A hemisphere having a diameter about two metres, and acting as a reflector is suspended from the ceiling so as to present its hollow face to the subject that is to be photographed. This hemisphere carries two carbon pencils, one of which is fixed, and the other rendered movable by a screw. The carbons are brought together in making between them a right angle. It is, in fact, a hand regulator, with this sole difference, that there is no mechanism, that the carbons are brought near to each other as they are consumed by means of a movable carbon. At each exposure it is necessary to bring the two carbons to the proper distance. The time of the exposure is so short that the light cannot fail. The novelty of the system adopted by M. Liebert consists in this, that the electric light does not fall directly on the sitter. This light is first projected on an obturator, which, in its turn, throws it back on the sides of the reflector, which are of dazzling whiteness, in such a manner that the luminous rays, thus divided, positively inundate the person whose image is to be reproduced. The light is superb, the face is softly lighted without hardness, without exaggerated shadows. The eyes bear the great brilliancy of this light without fatigue, without having to suffer from annoying scintillations. The electric light thus used is produced by Gramm's electric dynamo machine, studio type, which a gas motor of four-horse power actuates at the rate of 900 revolutions in a minute."

In his *Aide Mémoire de Photographie*, in 1888, M. Fabre thus describes an electric plant in a very large studio in Paris:—"Since some time a mode of electric lighting has been used in the studio of M. Walery, giving very good results. The person who is to sit is introduced into a room well lighted by incandescent lights, whose soft light does not fatigue the eye. When the exposure is fixed, two large arc lights are immediately actioned by the current. They are placed back of the sitter, who does not see them, and who does not experience any fatigue; they throw out an intense general light largely diffused, which, reflected by screens on the sitter, give the light which the operator chooses to select. The time of exposure varies from three to five seconds for an album card bust." Fourtier, commenting on the above, says: "We have here a very happy application of the two systems of lighting. Light by incandescence, which gives what I may call the physical image, that is to say, facility in the arrangement of the sitter and in focussing; with the arc light, which furnishes at the last moment the actinic rays which serve for impressing the plate."

The electric light is the only artificial light whose brilliancy can compare to the sun. Measured by its actinic properties, simply, it is not so very far behind that great luminary, its spectrum is longer towards the violet. The heating powers of the electric arc are no less remarkable. Platinum and iridium melt in it like lead and volatilise, and almost nothing seems to resist the elevated temperature of the arc. Despretz generated it *in vacuo* by means of 500 or 600 cells of Bunsen, and observed pieces of carbon volatilise like a piece of heated iodine. Flint melted to a glary mass, and boron behaved similarly; cylinders of retort carbon softened and bent into an S form. For these and many other reasons, experiment after experiment has been made to render the incandescent lamp practicable for photographic purposes.

Incandescent Light.—The simplest way of obtaining light from an electrical current is by passing it through a considerable resistance in such small compass that the conductor become intensely hot. It is, of course, necessary that the conductor shall be able to endure a very high temperature without injury. Iridium and platinum wire have been employed. Draper, in 1847, tried to utilise the latter for illuminating purposes. But the difficulty was that it melted like lead and volatilised if the current was too strong. King, therefore, took carbon rods in place of platinum, and, as these burn up quickly in the air, he enclosed them in a vacuum.

JOHN H. JANEWAY.

THE KODAK INSIDE THE GREAT PYRAMID.

[The Kodak News.]

There have been many discussions about the object and hidden meaning of the Great Pyramid, but it now seems clear that it was erected, as were all the other pyramids in Egypt, as a tomb only, and that for one man. As obelisks, typical of life, are only found on the east side of the Nile, so the pyramids, memorials of death, are found only on the western side, entirely surrounded by countless graves, on the borders of the great desert and the cultivated valley.

The Great Pyramid was built, so we are told, about 3700 B.C., by King Khufu (in Greek, Cheops) and is the largest and perhaps the oldest of all. It is of vast size, being originally 480 feet high, with a base that would fill up Lincoln's Inn Fields, each side being about 760 feet long. Part of the top has been broken off, and also the smooth outer casing, leaving it in its present rough and step-like condition.

In the heart of this mass a small chamber was cleverly constructed, a quadruple roof of enormous granite stones preserving it from being crushed by the great weight above. A passage led to the exterior, and after the king's death he was mummied, placed in a coffin inside the sarcophagus, and dragged up into the chamber, the mouth of the passage being subsequently blocked up and concealed, so that the body should not be disturbed. The entrance was, however, broken open centuries ago, and the body destroyed long before modern times.

After stooping and climbing along for a great distance, each person helped by two Arabs, we found ourselves in the King's Chamber, one day in February, 1894.

I had taken a quantity of magnesium wire inside, and, as we were burning this, it suddenly occurred to me to try and take a photo with my Kodak; I had only brought it in with me to save it from being used as a football by the Arabs if I left it outside. There was no support, and the heat in the tomb was intense, but I managed to lean, and at the same time hold the camera, against against one of the walls, whilst an Arab burnt about one and a half feet of wire. The result, fortunately, is good enough to show the sarcophagus in the position it has occupied throughout all history for nearly 6000 years. The lid and one corner are broken. It is possible to distinguish the place where the Arab lit the wire, and, at the end, dropped it, besides the names of several English tourists on the walls. It is also just possible to see one of the joints between the stones of the wall behind the sarcophagus, but it does not show very clearly, for even now, though no mortar was used, it is not possible to insert the finest blade between the stones, so perfect was the construction of this mighty tomb.

R. MacInnes.

PHOTOGRAPHS AND LANTERN SLIDES OF LIFE MODELS.

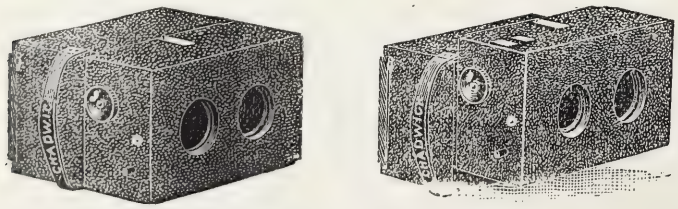
Mr. F. F. Weeks, of 81 Thorpe-rd., Forest-gate, E., has recently shown us some examples of his work in the production of studies from life models for lantern slides and general illustrations. Particularly effective is a set to accompany a lecture founded on General Lew Wallace's well-known semi-sacred romance, *Ben Hur*. Mr. Weeks' method, in which he is exceedingly skilful, is to pose and dress his models in character, and, where practicable, build up the scenic paraphernalia, photograph the whole, employing, when necessary, pen and ink work as a supplemental aid. The total results are exceedingly successful. Mr. Weeks is, we understand, about to extend his method to magazine illustration, and should have, as we hope he will find, great scope for his undoubted abilities.

CHADWICK'S STEREOSCOPIC HAND AND-STAND-CAMERA.

W. I. Chadwick, St. Mary's-street, Manchester.

The essential features of this Hand-and-stand Stereoscopic Camera are readily realisable from the illustrations.

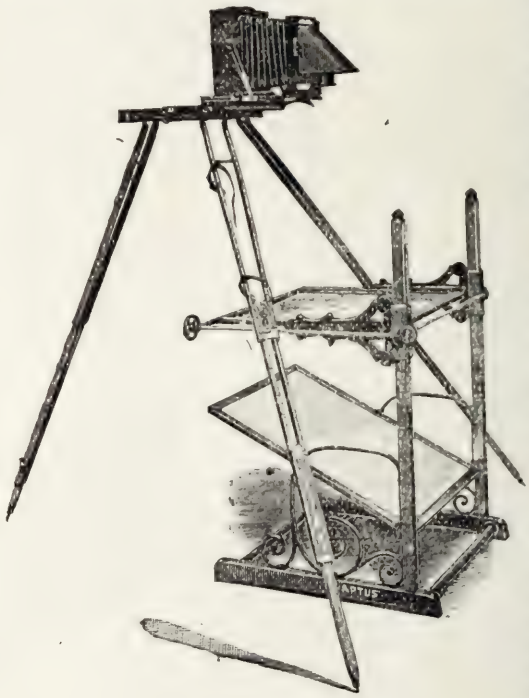
The entire front is made to rise and fall, carrying a Thornton-Pickard time and instantaneous shutter with speed indicator. The lenses are attached to the inside of the shutter, and the focussing is adjusted by



rack-and-pinion movement attached to the lens tubes. The focussing head and index are shown in the illustrations. The body of the camera is bound in real morocco, and Scott's patent dark slides for plates, or four double slides for films, are supplied, as may be desired.

APTUS MUSEUM STAND AND CAMERA.

The above apparatus has been designed and manufactured by Messrs. Sharp & Hitchmough, Liverpool, to meet the wishes of the Liverpool Director of Museums, who desired an instrument that should comprise the following points:—It was to be strongly yet lightly made, and capable of use with a rectilinear, wide-angle, or tele-photo lens, as it would frequently be required for outside work, such as botanical and geological studies, the photographing of wild birds, &c., in their native haunts. But, above all, it was to be quickly adaptable to photograph objects either directly above or below it without altering its horizontal position, and consequently without the usual necessity of performing a series of painful acrobatic contortions in endeavouring to focus vertically. In the first instance it would be used for copying such objects as ornamental ceilings, inscriptions, &c., or, in fact, any subject immediately overhead; and, in the second, for photographing, without distortion, anything on a lower horizontal plan, such as growing plants, collections of shells, jewels, pathological preparations, or other fragile and delicate objects which could not be conveniently fixed in a vertical position, and which it would be unwise, and sometimes impracticable, to remove from their cases.



The accompanying woodcut will explain the construction of the apparatus better than a whole page of letterpress, and also show the advantages of its use over the usually employed methods.

It will be noticed that the focussing is effected at the back of the camera by the ordinary rack-and-pinion movement, instead of by the lens, thereby saving a vast amount of trouble in arriving at the correct size of image. The tripod head is specially constructed with a forward extension, so that the camera may be brought directly over fixed show-cases, &c., with a minimum of trouble.

By the insertion of a prism between the combination of a rectilinear lens, objects at right angles to the camera, and which would be quite inaccessible to the ordinary instrument, may be copied with the greatest ease. The stand is fitted with a glass platform, which may be raised or lowered by a rack and pinion, and will be found exceedingly useful for photographing many subjects where it is essential to preserve the rotundity or solidity of form. The ofttimes unpleasant effect of cast shadows is entirely obviated by the transparency of the supporting medium and the reflected light from an opal glass below, which can be easily adjusted to any desired angle. Should the object be of a transparent nature, a suitable background can be immediately affixed by covering the reflector with a piece of black or other coloured velvet.

The uses to which the apparatus may with advantage be put are manifold; and, although the credit of a new invention is not claimed for it, the advantages of a horizontal camera, adjustable stages, and sliding tripod head are obvious.

There are, it appears, upwards of 7000 lighthouses erected in various parts of the world. The United States are said to have over 1300 houses, and as many posts, the latter being simpler in construction and not very expensive, since they are maintained on shore. The United States Government have been proceeding with the theory that the coast should be so sprinkled with lights that the rays meet and pass; that a vessel will meet the one in advance before the one in the rear is out of sight. The annual appropriation of their keeping is now, we understand, little short of 800,000*l*. Kerosene oil has been adopted by the Lighthouse Board as the luminant, though gas and, to a limited extent, electricity have been given a trial. It is considered that kerosene is both cheapest and best.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*August 2, 1895.*

THE LANTERN RECORD.

CONTENTS.

	Page
NOTES AND NEWS	57
THE SEARCH LIGHT. By RADIANT	58
LANTERN MEMS. By G. R. BAKER	59
A MUCH NEEDED IMPROVEMENT IN THE STEREOSCOPE. By PROFESSOR CHARLES F. HIMES, PH.D.	59
LANTERN-SLIDE MAKING. By SURGEON-MAJOR J. L. VAN GEYZEL, M.B., F.I.C.	60
COLOUR PHOTOGRAPHY	63
SPRATT BROS. "S.B." PATENT CAMERA	63
HAND-CAMERA EXPOSURES	64
KODAKS AS ENLARGING CAMERAS	64
A NOVEL COMPETITION	64

NOTES AND NEWS.

The following method of preparing substitutes for lime cylinders is quoted by the *Photographisches Archiv* from the Year-book of the Pasteur Institute:—"Rub down in a mortar some pure magnesium powder with distilled water, until it is of the consistency of a stiff paste that is easily moulded. Fill a glass tube, a few centimetres long, with this paste, the diameter of the tube being a little greater than the beads are to be. Push the magnesium paste firmly in the tube, and close with a cork. As soon as the cylinder has become somewhat firm, push it out of the glass with a pointed rod, cut it into pieces of a suitable length with a knife, and fasten a short platinum wire to each piece. This is to hold the magnesium bead over the centre of the burner. The beads are then rubbed round by the fingers, and dried for two or three hours over a water bath, when they become very soft. They are next brought into a limelight burner, and slowly warmed in the flame, at first without oxygen. This is slowly turned on until the bead is brought to the highest possible temperature, and gives out a blinding white light. The heat causes the bead to contract considerably, and it becomes so hard that it is difficult to scratch it with a file. As it is unchanged by the atmosphere, it may be left on the burner, and is always ready for use. Such a bead, of four to six millimetres in diameter, was used in the Pasteur Institute as a source of light for more than fifty hours. This method possesses many advantages over the lime cylinder. The light is much brighter with a given consumption of gas, and, owing to its small size, less oxygen is required to bring it to incandescence. It gives out little heat, and its white light is very actinic, so that objectives of the greatest aperture (microscopic) can be used. On account of its small size, the centering of the light and the illumination of the image are also more easily arranged."

* * * * *

We have received the illustrated catalogue of Mr. Charles Beseler, of 218, Centre-street, New York. Mr. Beseler is a maker of "high-grade" projection apparatus, lanterns, jets, regulators, &c., and, judging by the illustrations and descriptions given in his catalogue, his claim is well founded.

* * * * *

Mr. C. J. Lemaire, of 602-606, George-street, Sydney, N. S. W., has patented a method and apparatus for the utilisation of actinic light for the production of photographic pictures by night or day, such pictures to be called "actinographs." The invention "embraces the utilisation of actinic light, as produced by the combustion of gas oil, or other inflammable substances, in incandescent lamps, or as produced by electrical apparatus, by any of the numerous means of producing electric light. The actinic light thus produced having a photo-chemical action upon light-sensitive substances or specially prepared plates, the object of the apparatus is so to concentrate this light that the desired action will be produced in a uniform manner all over the object upon which it is projected, thus producing the desired picture. This uniform diffusion of the light is produced by an arrangement of reflectors and condensers to concentrate the light upon the individual centres necessary to give correct effects of light and shade. The primary light-producing apparatus consists of an arrangement of numerous lamps producing actinic light, arranged on a framework in a rectangular or a parabolic form, fitted with individual reflectors of a movable character, and regulated individually and collectively by taps." The use of condensers and reflectors in conjunction with artificial light is a good idea, in which, we fancy, Mr. Lemaire has been anticipated—at any rate, in this country.

* * * * *

Mr. Eadweard Muybridge, of The Chestnuts, Kingston-on-Thames, announces that during the season extending from October next till March, 1896, he proposes to give a series of lectures in Great Britain, on *The Motion of the Horse and other Animals, in Nature and in Art*, illustrated with forty new zoopraxiscopic projecting discs. He has lectured upon, or given demonstrations of, the results of his investigations at nearly all the principal schools and institutions of science, art, or education in Great Britain, in the United States, and on the continent of Europe, and he has recently returned from America with a series of forty new discs for use in the zoopraxiscope, none of which have yet been exhibited outside of his laboratory. These discs illustrate various continuous movements of horses, dogs, camels, elephants, buffaloes, kangaroos, and other animals; birds in the act of flying; and athletes running, jumping, turning somersaults, or engaged in other muscular exercises. After an analytical illustration of these movements, the consecutive phases thereof are projected—much larger than the size of life—in rapid succession on a screen, with the result of an apparent reproduction of the actual movement originally photographed from nature. The present will be virtually a repetition of the series of lectures given under the auspices of the United States Government Bureau of Education at the Columbian Exposition, and, although the training of the eye to a just appreciation of the movements of every-day life is their main object, they will be entirely free from technicalities, while the zoopraxiscopic demonstrations, although instructive to the scientist or the artist, are invariably a source of entertainment to the popular or juvenile audience.

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The Photographic Society of Japan is advancing by leaps and bounds. It is setting some of our home societies a lead in the matter of arranging for its own permanent premises. At the meeting held to discuss the matter, Viscount T. Enomoto (the President) was in the chair. After some discussion, proposals made by Prof.

W. K. Burton, as follows, were accepted:—1. That it is desirable that the Photographic Society of Japan have permanent quarters. 2. That the building shall consist of one room large enough for meetings, lantern exhibitions, &c., and several small rooms for developing, printing, &c., and for the residence of a caretaker. 3. That Mr. Y. Isawa is requested to prepare a rough plan and estimate for such a building. 4. That, when this estimate is finished, a request to members be made, in the name of the President, for donations to go to the construction of the building. 5. That all the affairs of selecting site and constructing the building be put into the hands of a committee of five, to be elected by the general committee of the Society. The Japan Society is evidently an energetic and business like body.

THE SEARCH LIGHT.

The exhibitions of lantern slides given at the evening meetings of the Convention just held in Shrewsbury appeared to be very much appreciated, especially by the lady members. The electric light was employed, the lantern being supplied by Mr. Walter Tyler, of Waterloo-road.

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Several stereoscopic cameras were in use by Conventioners during the week. Evidently binocular work is still advancing in favour among amateurs. I take this opportunity of remarking, however, that very few of the stereographers I have recently seen at work in the field appear to have grasped the important fact that the success, from a stereoscopic point of view, of their results very largely depends upon the selection of a suitable subject. Some prominent object or series of objects must appear in the foreground at a distance ranging, let us say, between seven and twenty-five feet from the camera, assuming lenses of about five inches focus and mounted at three-inch centres. Subjects with perfectly flat foregrounds, the nearest object being perhaps one hundred feet away, such as I saw frequently exposed on during the Convention, give inffective and disappointing results in the stereoscope.

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It is also surprising to note, as one is bound to do when looking at the cheap stereoscopic slides that prevail just now in such large numbers, how heedless even professional photographers are in this matter of "building up," as it were, the stereoscopic picture. In the majority of instances no attempt is made to give the foreground of the photograph its proper value by assuring the presence therein of some more or less prominent object, and the consequence is that most of the effect aimed at is lost upon those who examine such pictures.

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Rambling through the photographic Exhibition at the Royal Aquarium one afternoon last week, I suddenly found myself a prisoner in the hands of my commanding and irresistible friend, Mr. E. A. du Plat, who very kindly piloted me through one or two of the minor shows now on view there. I don't mind confessing that these came as a welcome change to me after the monotony of the photographs, as you will easily understand when I tell you that two of the shows rely to a large extent for the success of their effects on colour, and plenty of it.

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The *Decapitation of the Doge of Venice*, one of these shows, is a realistic and gorgeous piece of work, the production of Mr. H. Davies. It is a tableau, filled with wax figures, of a striking and not uncommon episode in Venetian history. On the steps of the Doge's palace are grouped soldiers, monks, ambassadors, members of the Council of Ten, high Republican functionaries, and others, the centre of the picture being occupied by the grim-looking headsman and his block, towards which the doomed Doge is being led. The colour, composition, and grouping of the tableau are extremely well done, the dresses, armour, and accessories being archæologically accurate. As a spectacular reminiscence of life in the mighty Venetian Republic, this tableau should certainly be seen and studied.

History of a different kind is drawn upon as the inspiration of a clever and delicately executed panorama, chiefly in solid relief—*Palestine*. This is palpably the outcome of great artistic and executive ability. You pass, so to speak, by a wall, in which there are several apertures, and you successively look out upon the concrete realisation of many scenes described in Holy Writ. Bethlehem and the surrounding country at the moment of the Nativity are before you, peopled with the characters of whom we read, and you gaze upon the country that is by the Jordan, upon a smiling land and quaint villages, hills, and valleys, and streams. The effect is much like that of viewing the country from a lofty hill by means of glasses. The elaboration of detail, the beautiful colouring, the minute care bestowed upon the figures and modelling, are very remarkable. *Palestine* is one of the most pleasing bits of panorama work I have seen.

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Then, finally, my guide took me down a gold mine. You enter by a lamp-lit tunnel, and in a few seconds are standing in a room viewing a working model, shown in section, of the Saratoga Gold Mine, Colorado. The section reveals a veritable world of industry and activity honeycombing a mine which is supposed to be 800 feet deep. All the multifarious operations incidental to mining are shown in actual movement. It is an interesting and instructive model cleverly and laboriously carried out by a mechanical genius, Mr. William Keast, who worked in the mine for several years. Those of my readers who go to inspect the photographs should also see the three little shows I have referred to; they are exceedingly good and satisfying, and distinctly out of the common.

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I am pleased to notice that the Conference of Secretaries of London Societies, held under the auspices of the Affiliation of Photographic Societies on June 26, discussed the steps to be taken with a view to prevent the numerous exhibitions held in London clashing as much as in former years, and decided upon a course to be pursued. On several occasions, I have drawn attention to these clashings, and have indicated their harmful reactions one upon another, which it is to be hoped will now disappear. Of the London societies usually holding exhibitions in the late autumn, three—the Leytonstone, the Hackney, and the South London—are steering well clear of each other. I trust the Stanley Club, the Ealing Photographic Society, and the other societies concerned will take note of this and do likewise.

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A well-known lecturer, who employs the lantern extensively, writes: "During some recent journeys by railway I have observed at the stations of several lines notices to the effect of the company prohibiting the transportation of compressed gases by passenger trains on any consideration. The lecturing season is rapidly approaching, and a great many lecturers will have, no doubt, engagements to fill under conditions which will render it impracticable for them to send their cylinders by goods trains. Will you not use the powerful influence of the Journal to get this resolution so modified that the companies will permit the transportation of gas cylinders, provided they are packed in wooden boxes duly marked? It is highly desirable that the commission of experts appointed to inquire into the whole question of packing gases shall issue their report and recommendations as early as possible, so that the railway companies may see that they have been subjecting themselves and the public to a great deal of unnecessary alarm, which I am pleased to see you have done so much to allay."

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The London correspondent of the *Journal of the Photographic Society of India* has the following good word for moonlight photography:—"A very attractive branch of our pursuit is moonlight photography. By this I do not mean astronomical work, but the portrayal of terrestrial pictures under moonlit conditions. Scenes by night have always a charm and mystery of their own. We have just made a lantern slide from a moonlight view of the Houses of Parliament and Westminster Bridge, with the river in the fore-

ground. This was taken from a window of St. Thomas's Hospital, and gives a most tender and poetic picture. The exposure was two hours, with an aperture of *f*-16, and the night a decidedly dark one. In many other regions moonlit photographs ought to be multiplied galore as an easy and certain means of obtaining still-life pictures, always interesting and generally artistic." RADIANT.

LANTERN MEMS.

THREE weeks under canvas listening to the bang-ping of the rifle bullet or the more or less perfect volley firing in the various competitions that have been in progress at the National Rifle Association's Camp at Bisley is not conducive to thoughts of lantern matters or optical projection, in fact my surroundings were such that it was difficult to even read in earnest. It will therefore be understood that a difficulty has been experienced in keeping in touch with what is taking place in the lantern world. Although the elections have been in full force during this time, very little excitement reached the camp beyond the desire to see how the *Daily Graphic* ladders were being mounted each morning, and the pedestal or other device in the evening papers showed the balance of parliamentary parties, for one could not turn right or left without hearing all about bull's-eyes, inners, &c., and how a H. P. (highest possible), consisting of seven bull's-eyes counting five each, was spoilt by a beastly mag (magpie), counting three only.

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IT is only on my return to town I learn that lanterns have been used for election purposes; sometimes to try and win over waverers to the side whose screen pictures were designed to bring out all the wrong doings of the opposite side, also for illuminating the latest returns. One large political club had set up the screen and lantern all ready each night to let the public know how things were going; but, if I am correctly informed, after two nights' adverse returns, and when all hope of capital being made out of the plan was past, the lantern and belongings were sent away, "bag and baggage," and the contract cancelled, notwithstanding it was originally intended to last through the whole of the election in Great Britain and Ireland. Such is the irony of fate.

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WHAT is this good news about conveyance of gas cylinders? Is it right they will be collected and delivered by the railway companies' vans, as of old? At present, from what I can gather from the stationmaster of an important junction station, no official instructions have been received, and yet I am informed, on trustworthy authority, that the railway companies have decided to collect by their vans, as of old. Users of gas may, perhaps, not realise as fully as the trade do what this means to the compressed gas industry; but, to my thinking, it is of vital importance, as the *personal* delivery of each cylinder to the railway terminus or goods depot must of necessity be a serious drawback, if not a positive hindrance, to the use of compressed gas.

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AT this time of the year one naturally asks what is to be the novelty for the coming season. At present, as far as I can see and understand, it is all conjecture, but, as September is the month for the announcements that affect "Lanternia," we shall not have to exercise our patience much longer. As far as my experience allows me to judge, I do not think it will have been found worth while to develop the miniature lantern craze that set in two or three seasons ago, for the British are essentially a practical race, and, although desirous of saving themselves trouble in the way of weight-carrying, do not like to miss, to any extent, efficiency, and so moderate or full-sized lanterns are more appreciated now than those which occupy less space.

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FASHION, after all, is influenced by public opinion, and, if the largest-size apparatus appeals to the public eye as being the most powerful, and gives, if not better, equally good results, the balance is in its favour while it is "in evidence," and now that the mystery of lantern entertainments has departed, and the apparatus is in full view of the audience, it is pretty certain that the apparatus having a good appearance will command more respect than an insignificant one capable of producing the same results.

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ARE we to have a new light for lantern projection next season? This is a question that naturally occurs to one, but, as we are at present informed, it seems we shall have to be content with those lights we already know and use, viz., paraffin, incandescent gas, limelight of various kinds, including ether, mixed, and blow-through gas, spirit, &c.; but, as to acetylene, it seems to be still in the dim, distant future.

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As to electricity, there is evidence that more and more demand will be made on this power to produce a suitable light for projection, and there should be no difficulty in selecting from the several good forms of regulators a suitable lamp for the particular purpose required.

G. R. BAKER.

A MUCH-NEEDED IMPROVEMENT IN THE STEREOSCOPE.

[Photographic Times.]

THERE seems to be on all sides evidences of a growing interest in stereoscopic photography. How extended this may become, and how permanent it may be made, are questions to be answered mainly—according to a long experience of the writer with the instrument—by the completeness of the adaptation of the instrument to the requirements that may be made upon it. Any extension of the use of the stereoscope must rest upon more general recognition of the substantial merits of the instrument, and fuller utilisation of the possibilities peculiar to it, especially in the many directions opened up to it by the recent progress of photography. As a fad, interest can be revived in it only to a limited degree, and for the life of a fad. The popular estimate of the instrument must be raised, and a fuller appreciation of its character as a means of study, of instruction and of investigation, as well as of entertainment and recreation, must be created. It must be recognised as accomplishing something that cannot be done as well, if at all, without it. Many causes, doubtless, co-operate to depress the popular estimate of the instrument; but, according to the observations of the writer, the chief cause is its failure, in too many cases, to impress the individual favourably, on first trial—because so much has been left undone by it—to relieve the unusual effort involved in its use. The peculiar effect produced by it may be pronounced by such a one curious, or even wonderful, but the discomfort associated with its realisation robs it of anything like fascination. If one individual happens to become interested beyond this point, and allows himself to be led on into the study of a number of pictures by reason of an interest in the pictures themselves under the new conditions, upon which alone continued use of the instrument will be based, he may leave off with a sense of weariness, perhaps of painful fatigue, that may disincline him to recur to it soon again, or to adopt it as a usual means of study or of recreation.

It has been a matter of frequent observation, that in a miscellaneous company, when stereographs have been brought out illustrative of some topic of conversation, in which all have been equally interested, that many have been found who, upon first inspection of a picture in the stereoscope, have declared that they could not see it, or that they saw it double, or at least that they could see better with one eye than with two, and who would then persist in looking only with one eye, satisfied, in spite of all argument to the contrary, that it was not their privilege to enjoy the stereoscope, and who perhaps easily reconciled themselves to do without it. In such cases, even if the effect has been fully realised with some pictures, a vain struggle with others has left them in the same unappreciative frame of mind. With students in the laboratory to whom it has been assigned as the subject of an exercise in connexion with vision in general, accompanied by a carefully selected, systematic series of characteristic pictures, as well as by photographic practice, the experience has been in no wise different, except that by encouragement to persevere, and in some cases after patient effort, every one eventually, with normal vision, acquires facility necessary to comfortable use of the instrument for all purposes.

Now there is no optical instrument that can be as perfectly adapted to

easy, comfortable, satisfactory, and ready performance of its work as the stereoscope. There is none with which complete utilisation and enjoyment depends less on experience with it, and facility in use derived from it; none the use of which should be accompanied by less conscious effort and fatigue. The use of both eyes itself gives a normal character to vision with it, wanting in many optical instruments, to which the growing popularity of the binocular microscope may be attributed in great degree, as well as to the stereoscopic effect. All that is unsatisfactory in the use of the stereoscope may be mainly attributed to two causes, happily so related to each other, that a device for the elimination of one will accomplish equally well the correction of the other. One of these is the variation in the width of the picture, or, more precisely, the distance between similar points of the pictures, and the other the varying interocular distance of different individuals. The effects of the first are easily recognised and demonstrated. In many cases when an individual throws aside a stereograph with the remark that he can see it more satisfactorily with one eye than with two, the substitution of another stereograph may call forth an exclamation of surprised satisfaction, and it will generally be found in such cases that the pictures in the latter case are not as wide. From a miscellaneous collection a number may generally be selected which will have this satisfactory character, but they only render the others more tantalising to the intelligent user, and such broken use is not calculated to popularise any instrument.

The remedy most frequently proposed for this troublesome feature, recognised generally by writers on the subject, is the adoption of some suitable, uniform limit of width of pictures—a sort of carefully ascertained average of about two and three-quarter inches. This, even if feasible, or even desirable, could only be realised fully, if at all, in a rather remote future, leaving the present supply, and the accumulated collections, often of unique value, unaffected, and at best would be very incomplete and unsatisfactory, since variation in interocular distance, the other influential variable, would still remain. Individuals would still look through different parts of the lenticular prisms, with consequent different refracting, or, so to speak, combining, power for each. This could be remedied by having a number of stereoscopes from which an individual could select one suitable to his eyes, a plan hardly worth consideration. But even if possible to establish a world-wide commercial standard for width of pictures—for nothing short of a world-wide standard would answer any purpose—the amateur would be the first to make exceptions. With a print before him, every detail of which he may have learned to appreciate with its study and selection, he will know too well how much of beauty and of value may be sacrificed by reducing the width by only the one-fourth of an inch to the required two and three-quarter inches. There may be in that one-fourth inch not only some object necessary to the artistic effect of the whole, but even a wealth of that detail which the stereoscope so exquisitely renders. He will venture to retain the three inches, knowing that he can master it, even at the risk of having an unruly and unsatisfactory picture for many of his friends. So, in pictures in the trade, three inches will often include nothing that any one would very willingly part with, and the last one-fourth inch might make a picture saleable to the person most accustomed to the instrument, likely in any event to be the best customer. It is to the modification of the instrument, then, that relief must be looked for. It is simply an aid to the accomplishment of what any one with proper effort can do without it, but what few will take the time or trouble to do without it. The invention of the stereoscope by Wheatstone was subsidiary to the demonstration of the fact first established by him, that perfect illusion of solidity can be produced by means of flat drawings made by and presented to the right and left eyes respectively. The discovery of this fact was characterised, at the meeting of the scientific body before which it was first brought, as "one of the most curious and beautiful in the entire range of experimental optics," and was regarded as affording an explanation of phenomena of vision that had long perplexed philosophers. It is a highly interesting fact to-day. The demonstration of it is in itself a pleasant surprise to-day to any one viewing a stereograph for the first time. But an instrument limited, as it was, by drawings made for it in its application to the demonstration of that fact, and the investigation of curious conditions of vision, could possess only a scientific value, and elicit no popular demand. But with the advent of photography, and especially with the perfecting of the collodion negative process and of cheap methods of multiplication of paper prints, and ability to command pictures of a variety of subjects perfectly adapted to the demands of the stereoscope, the widened field of its applications was recognised. It became at once more than an instrument to demonstrate a single fact. It took a new form in the hands of Sir David Brewster, more fully adapted to the popular demand to be made upon it. He not only devised the lenticular stereoscope, universally employed to-day, but suggested many directions for its employment, and was enthusiastic in his expectations for it.

Photography of to-day has still further extended the horizon of its usefulness. But unfortunately in cheapening the instrument for the great public, some of the adjustments essential to its highest efficiency and comfortable use, on which he laid stress, were lopped off. It hardly had the consideration awarded an optical toy. For a long time adjustment to varying focal distance of different individuals was wanting, although the instrument is pre-eminently one for the study of details, and calculated to direct attention to minutiæ, to reveal features easily overlooked, to assert the beauty and importance of otherwise almost meaningless patches of light and shade, or confused lines. To the complete rectification of this defect in the Holmes stereoscope so simply and so inexpensively, the survival of the stereoscope to the present as a popular instrument may be almost entirely attributed.

But the adaptation of the instrument "to suit different persons whose eyes are more or less distant," and incidentally to pictures of larger size, was as fully recognised by Sir David, and several simple, practicable mechanical devices, actually employed for the purpose, were described by him. All that is required to be effected is an easily controlled, uniform, simultaneous movement of the lenticular prisms from or toward each other, through a very small distance, thus enabling each individual readily to bring before each eye the corresponding portions of the prisms, where the refracting power will accomplish with the least, or no perceptible, strain the combination of the particular pictures for his eyes. But such an instrument is not now to be had. A few years ago Professor Le Conte Stevens devised a form simple and effective, and comparatively inexpensive. It was placed upon the market by a leading firm, but before even those employing the stereoscope were more than aware of its existence, or the public at large of its advantages, it seems to have been regarded as commercially unsuccessful, and ceased to be supplied. No instrument of the kind will have the success of a fad, but if kept properly before the public its merits will be recognised by those who employ and enjoy the stereoscope, and the ranks of these will be recruited from those who, while appreciating the instrument, and all it can do, have not been inclined to submit to even the slight discomfort accompanying its use without this adjustment. But such an instrument possessing this universal character, adapting itself equally well to individual peculiarities, and stereographs of all sizes to be met with, while retaining the qualities of simplicity, portability, and cheapness of the Holmes stereoscope, with the superadded adaptability to easy, comfortable, satisfactory performance of its work, would not only soon acquire and hold a place as it has done, but would greatly enlarge its applications, and enter into fields from which it is now excluded by this apparently trifling defect. If fairly placed side by side with the present defective instrument, the latter would disappear as an uncalled-for article.

It was not the purpose of this article to enter into the details of possible applications. In education, its peculiar capabilities, once fully understood in combination with photography, would render it more effective in individual instruction than the magic lantern can be made with crowds, and for a greater variety of subjects. The salesman would find it supplementary to simple photographs as substitutes for samples in many cases. In the study of art, of places, &c., it would be found an invaluable aid. In investigation it would fix facts and data beyond the peradventure of a doubt, wherever the location of points or lines in space is involved. The writer has employed it to separate the apparently confused bundle of lines given in the photograph of successive sparks from a Holtz machine. The lines of force in a magnetic field can be mapped in space according to a plan of Professor Stine as neatly as a section of it by the usual method with iron filings. Stereographs of the moon on the one hand and of microbes on the other are equally among the possibilities.

And so the list might be continued, to emphasise this plea for an instrument so perfected as to encourage the utilisation of possibilities barely hinted at. PROFESSOR CHARLES F. HIMES, PH.D.

LANTERN-SLIDE MAKING.

[Amateur Photographic Society of Madras].

I AM not here to-night to tell you anything new on this subject; indeed, it would be as difficult for any one to say anything new about lantern-slide making as it would be to communicate anything original about negative-making, or bromide printing. I was asked if I would show how to make a lantern slide, and I promised I would undertake the task. In doing so,

however, I will proceed as if lantern slide-making were new to all of you; in this way those who have had little or no experience in the matter may be benefited, while I am sure that other members will endeavour to bear this infliction with patience. In the first place, let me dispose of the question of choice of lantern plate. I have no experience of wet-collodion plates at all, but slides produced on them are, of course, remarkable for their brilliancy. There is on the market a *dry*-collodion plate (Hill-Norris) for those who prefer collodion to gelatine films. The gelatine dry plate, as manufactured at the present day, is an article of great perfection, quite easy to manipulate, and capable of yielding first-class results. This is all that is wanted of any lantern plate. I say this, knowing fully that there is still great diversity of opinion as to the best process for the production of slides—collodio-bromide, albumen, wet-process, &c.; but, having seen the slides of the different experts, one cannot help concluding that, after all, it is not so much the process as the worker that has much to do with the question. For my own part, I have tried several popular brands, and there is not very much to choose between them. I have had my choice all the same, and I now invariably use it and no other. To others I would say, as for negatives so for lantern plates, to get the best results, stick to one brand of plate.

The most suitable negatives for production of lantern slides are those which are full of detail, not over-dense in the high lights, with a good range of tone, and free from hardness. I show you such a negative, and will now put the slides made from it through the lantern. That some density as well as range of tone and detail is needed, the next slide and its negative will convince you. This latter negative is a very fine one, and it has yielded more than one medalled print, but it just lacks one of the qualities necessary to produce a first-class slide. If anything, the latter is the better negative of the two; of the slides, the former undoubtedly. From a suitable negative you can, of course, make a good slide (provided development of the slide is correct); but there is scarcely a negative so bad that a decent enough slide cannot be got from it by intelligent modification of the exposure and the development. Thin or weak negatives should be printed by short exposure and a developer stronger in the developing agent; while hard negatives, with strong contrasts, are better printed by full exposure and a weaker developer. The correction of defects arising from errors in this respect I will touch upon later on.

There are two methods of printing lantern slides: (*a*) Through the camera; (*b*) by direct printing. In the former method the negative is placed in front of the lens, and the image is received upon the sensitive plate placed in the dark slide; in the latter method, the sensitive plate is placed in contact with the film side of the negative, which is printed by exposure to daylight or to artificial light. The first method is generally adopted when enlargement or reduction is necessary. As the most common necessity is to reduce a large picture to the lantern-plate size, the method through the camera is generally spoken of as the method by reduction; and this I will show you first.

The Camera Method.—There are reducing or enlarging apparatus sold by various makers, and they are more or less handy. But one can do with very little in the way of apparatus, and the essential parts can be constructed by any native carpenter. I show you what I work with. Two deal-wood planks each 5″ × 8″ are nailed down upon two cross pieces so as to form a bench, the planks being separated by a slot about ¾″ wide. This bench is placed on a table, and pointed skywards by placing a box under the further end of it. On the bench is the reducing apparatus, which consists of a box to hold the negative and the camera. The negative-holder is only a small deal-wood box, without a front, and a square opening cut in its back. Behind this opening the negative is placed in a grooved slide, the interior of the box being blackened to prevent reflection of light. The negative is placed film side towards the lens, and upside down, to facilitate focussing. No light should be allowed to come through the clear glass edges of the negative, the rebate edges of the opening in the box should cover these clear glass margins, which should otherwise be previously blocked out by pasting black paper on the glass side of the negative. If this precaution is not taken, considerable amount of halation will spread over the margins of the slide. The negative-holder can be fixed to the bench by a screw with wing nut, which travels along the slot, and so permits of alteration of the distance of the negative from the lens. The camera is fixed by its own screw to the bench, with the lens pointing at the negative. My own camera does not permit of sufficiently long extension, and so I have been obliged to add body to it. I have done this by making a pair of bellows out of common brown paper lined with black cloth, the bellows being glued to a front and back upright frame. The sliding front of my camera with the lens is removed and slid into the front frame, while the back frame of the new bellows slide into the front of my camera. In this simple way I have a camera on the working bench which permits of all the extension that I require for reduction, from ½ to lantern slide, with a 10″ R.R. lens. The bench is ruled with parallel lines ½ an inch apart, so that the negative, when in the holder, and the ground glass can be placed practically parallel. The negative box may require raising or lowering in order to centre the lens as correctly as possible. These preliminary matters being arranged, the distance between the lens and the negative is adjusted so as to reduce or enlarge the image on the ground glass, which should be previously ruled so that the position of the image may exactly occupy the position of the lantern plate when in the dark slide.

The image is next carefully focussed, using the full aperture of the lens and a magnifying glass; the dark slide, which should be fitted with a carrier to hold the lantern plate, is next introduced, a piece of ground glass is placed behind the negative, and the requisite exposure is given, and here comes the first pitfall. There is absolutely no certain rule of exposure which can be laid down for a beginner—it must vary with the light, with the density of the negative (which I find is the most important factor of all), and the rapidity of the plate.

I give below a useful table of proportionate exposures (approximate) for various brands of lantern plates. I regret that I have kept no note of the source from which this information was obtained:—

Imperial special	1
Paget rapid	1
Hill-Norris	2
Ilford special	2½
Mawson	3
Imperial slow	3½
Paget slow	5
Edwards's	5
Cadett	5
Thomas's	7

Even with the same plate, the exposure varies very much for different negatives.

The matter, however, is not such a hopeless affair, for with a little experience (if one carefully makes the notes of exposures and results) the difficulty can be overcome with certainty. Using Ilford special lantern plates, a R.R. 10″ lens, I find that a ¼ negative, of what I call average density, such as the one which I show you, requires an exposure, through an aperture *f*-22, of 20 secs.; the other, which I show you, is what I call a dense negative, and it requires 35 secs. through *f*-16. Both these slides I show you now through the lantern, and they are, you see, in all respects equally good. I can, however, imagine negatives which require greater or less exposure even than these, and the expenditure of a dozen plates over experiments, to get an idea of the exposure, will in the end save a beginner many rupees, besides time and temper.

Direct Printing Method.—No apparatus is required here beyond a printing frame; and the method consists in placing the lantern plate on the negative, film to film, and printing in the usual way. This method is not necessarily confined to printing from ¼-plates, for portions of larger negatives may be printed and often make very good pictures. For this purpose special printing frames have been designed; but in such a case a mask cut out of black paper to fit the portion to be printed is all that is required.

Even when printing from ¼-plates it is necessary to mask the portions which are not under the lantern plate by strips of black paper; otherwise light enters at these parts and through the exposed edges of the plate, causing fog. A piece of black cloth or paper should be put next the plate, before the pads of the printing frame are put on, otherwise halation is apt to arise by reflection of light from the white pads of the printing frame. For the exposure daylight may be used; but, as for bromide printing, this method is not so certain as by using artificial light. I always use a kerosene light: one wick of a Hinks' double burner, which is turned full up just short of smoking, with a clear glass chimney. Using the same brand of plate as before, I find that a negative of average density requires an exposure of twenty seconds at a distance of two feet from the light. I show you negatives, however, which require exposures from five seconds up to sixty seconds.

Whether the slide has been printed through the camera or by reduction, the image is latent and must be developed. There is, however, in the market a lantern plate, on which the image is apparent during printing. I showed a Paget printing-out plate, during the process of printing, at a previous meeting; and I now show you some slides on these plates through the lantern. These plates require no development, they are toned and fixed like the ordinary silver prints.

Development of the Latent Image.—There is a variety of developers to choose from; but, as my demonstration to-night is only to show *how* a slide is to be developed, I will confine my remarks as much as possible

within these limits, and for this purpose I will state that the chief requirements of a good slide can be satisfied by using hydroquinone as the developer. The formulæ given by the makers are usually the best all-round formulæ, and so it is advisable to stick to them. I have here to-night some Ilford special lantern plates, and so I will use the formulæ prescribed for them:—

Hydroquinone	4 grains	Sol. No. 1.
Sod. sulphite	24 ,,	
Pot. bromide	¾ grain	
Water	½ ounce	
Sod. hydrate	2½ grains	Sol. No. 2.
Water	½ ounce	

For use, equal parts of these solutions are taken, and the whole is diluted with as much water again. It is advisable that the developing solution should be freshly made up; and, in order to obtain the best results and have the development under control, it is advisable, for a beginner at least, to use fresh developing solutions for each plate. Accordingly, to develop a dozen plates, three ounces of each solution should be made up as above, and each should be diluted to six ounces. Half an ounce of each can then be used for every plate. My plan is not to mix these equal parts of Nos. 1 and 2 solutions and flow them over the plate, trusting that all will go well. If the exposure has been nearly accurately timed, this method will give satisfactory results, but who can accurately time twelve plates for twelve different exposures? As in developing negatives, so it is necessary, even more so in the case of lantern positives, to have the development in hand. I usually begin by taking equal parts of Nos. 1 and 2 solutions (diluted as above) in separate cups, adding first only a part of the alkali solution No. 2 and adding more alkali in smaller or larger instalments, watching the progress of development all the time. Provided that the plate has received sufficient exposure, this is the most rational, and in my hands it is the best, method of developing lantern slides. If a lantern plate is under-exposed, forcing up the picture generally ends in fog—in that case nothing is lost by not having added all the alkali solution in the first instalment.

In a correctly exposed plate the image appears in about forty seconds, comes up evenly and slowly, gaining density, showing well up on the surface without fogging of the high lights; and development is usually completed in three to four minutes. Towards the end of development pick up the slide from the dish, examine its density by transmitted light, and let development proceed while the slide is laid on the palm of the hand—the densest parts of the image should show fairly on the back of the plate when viewed by reflected light—and be ready to wash off the developer at the right moment, *i.e.*, before the high lights fog. Different brands of plates require slightly different degrees of development, some allowing of more veil than others, the veil clearing off in the fixing bath. Two good general rules in development are: Don't be impatient to see the picture appear, and stop development as soon as the plate looks like a light print, and just at the moment that veiling begins rinse off the developer, and wash for a few minutes in a dish of clean water, then fix the plate in hyposulphite of soda. The undeveloped silver salt dissolves out almost in no time, but the plate should not be considered thoroughly fixed till it has been about ten minutes in the fixing bath.

There are two main objects to aim at in producing lantern slides, at any rate for oil-lamps which, is what the great majority of us in this country are condemned to, viz.:—

(1) Thinness with plenty of detail, and not density. The densest shadows should not be so dense that print cannot be visible through them when the slide is laid down upon it.

(2) The highest lights should be clear glass.

In short, a good slide when laid down on a piece of white paper should show detail everywhere, and should appear like a print upon the paper with a bit of glass over it. [Demonstration:—Correct development of a slide, over-development, under-exposed slide forced. Results compared and what to avoid in them printed out.]

Local Development is sometimes necessary to save a slide which would otherwise lack detail in the high lights. When the slide has developed sufficiently to make it apparent that the details in the high lights are hanging back, a soft camel's-hair brush is dipped in the alkaline solution No. 2 and applied over these parts, followed by a flowing of the developer over the slide by rocking the dish. This operation can be repeated until the desired result is obtained.

General and Local Reduction.—Slides which lack brilliance from over-development and veiling must be cleared; and for this purpose Howard Farmer's ferridcyanide reducer is the best. A few small crystals of red prussiate of potash are dissolved in some 1 in 10 hypo solution until it acquires a very pale sherry colour. The slides are placed in this solution, one by one, and, as soon as sufficient reduction has taken place, it is quickly removed and rinsed under the tap. The slide should then be placed in some clean hypo solution for three or four minutes, otherwise the film will be stained yellow from the prussiate solution, and then washed as usual. If it is desired to reduce the slide further, the operation can be repeated. The reduction is best performed in a white porcelain dish, as the action can then be watched against the bottom of the dish, which makes a good white background.

It not unfrequently happens that only a portion of a slide is too dense, or some part is veiled in which it is desired to obtain clear glass; for instance, it may be desirable to clear off the sky from a slide in order to put in suitable clouds. In such cases, a slightly stronger reducing solution is applied by means of a camel's-hair brush to those parts which are to be specially reduced, the whole slide being occasionally dipped in weaker reducing solution, to avoid hard lines. This operation is best performed with the slide held in the hand in a slanting position, so that the reducer drains away from the other portions of the image. The reducing solution should not be too strong, otherwise the action will be too rapid; its progress should be closely watched, and the slide put under the tap the moment the desired result is attained. [Demonstration.]

Intensification.—Slides which are thin and washy can often be improved by intensification after reduction. Any of the ordinary methods which are recommended may be employed. I myself usually employ the method of intensification which I showed you at a previous meeting, when I gave you a demonstration on the after-treatment of bromide prints. Briefly, the image is bleached with mercuric chloride, redevelopment with 1 in 60 solution of rodinal, and reduced again if required till the high lights are cleared.

Tones.—I have now shown you how a slide can be made of the usual black or bluish black-tones. *Warm tones* can be obtained by using plates specially made for them, such as the Alpha plates, full directions for working which accompany the packets; but warm tones may also be obtained on the ordinary plates intended for black tones by increasing the exposure about eight times and developing with a strongly restrained developer and plenty of patience, as the image under these circumstances should appear in about five minutes. Development proceeds then very slowly, and, when sufficient density is obtained, the slide is fixed and washed as usual. Mr. Hodges gives a method of obtaining ruddy sepia tones on Ilford special plates, which I have tried with success, and which I cannot do better than describe briefly. His formula is:—

Sulphite of soda	240 grains,
Water	35 ounces,
Citric acid	30 grains,
Pyro	40 ,,

the ingredients being mixed in the order named, and kept in a well-stoppered bottle. The alkali which he uses is ten per cent. liquor ammoniæ, with ten per cent. bromide of potassium solution. He maintains that, when warm brown and sepia tones are desired by the reduction process, daylight must be employed, which is an advantage for Indian workers. The rule, he says, is to fully expose, for, with the restrained developer, even a considerable amount of over-exposure will only result in increasing the warmth of colour. The plate is first soaked in water, in order to avoid surface stains or developer scum marks, and the developer made up as follows is evenly flowed over the plate:—Two ounces of the above stock pyro solution are mixed with thirty minims of the bromide solution and twenty minims of the ammonia solution. The dish must be kept rocking all the time, otherwise the half-tones, such as the sky, will present a mottled appearance. The image will be long in appearing, but development must on no account be accelerated by the addition of more ammonia. If the image does not appear in three minutes, ten minims more of ammonia solution may be added, in which case the colour of the slide will not be quite so warm as you desired. The image develops very gradually, and, even when full detail is out, it still lacks density (which must be judged by transmitted light); but, by continuing development, density increases gradually, and the high lights will not fog unless an undue amount of ammonia has been added. Plates which are too warm in tone, or which are brownish and thin from over-exposure, can be changed to purplish tones by toning in weak gold solution, *e.g.*,—

Chloride of gold	1 grain,
Sulphocyanide of ammonium	15 grains,
Water	4 ounces,

is a formula which I have tried with satisfactory results. (Slides shown.)

Printing in of Clouds is sometimes necessary to complete a good slide, If the horizon line is fairly straight, nothing is simpler than to

print the clouds only upon another slide, and bind it film inwards as the cover glass. Care must, however, be taken that the horizon lines correspond on the two slides, and the clouds must be printed from a negative in which they are lit from the opposite side to that from which the picture is lighted, since, in using the slide as a cover glass, the clouds will be reversed. With a judicious use of the camel's-hair brush and reducing solution, there is not much difficulty in accurately fitting the two slides so that the landscape and horizon blend with the sky. [Slides shown.] Other methods of printing clouds into slides will occur to members, and careful workers will find no difficulty which they cannot overcome. Time does not permit of my dwelling on this subject.

The final operation in connexion with lantern-slide making is—

Mounting and Binding.—This is necessary in order to prevent the film getting injured. A clean cover glass is laid on the film of the positive, and the two glasses are bound by strips of gummed paper or starched tape. The majority of slides will require a mask, and indeed it is advisable to insert a mask between the cover glass and the film in all cases, as the latter is thereby protected from the risk of friction. These can be bought or can be cut to any shape, the most common shapes being the circle, the oval, the dome, the square, or the square cushion. It is sometimes desirable to cut off portions of a slide which are defective, and this can be done by a suitable mask; in all cases select the mask which is the best suited to show off the slide to the best advantage. After binding, the front and back of the slide are cleaned to remove the gum or starch, which may have oozed during the operation of binding; the name is written on a label and pasted on the lower edge of the cover glass, or the name may be written upon the mask itself before it is bound in. Two white paper dots are pasted on the two top corners of the cover glass, in order that the lantern operator may readily discover the top and front of the slide; and this completes the process of lantern-slide making.

In closing this demonstration I cannot do better than commend to you some very pointed remarks of Mr. Hodges:—"I am not one of those fortunate individuals who can make twelve perfect slides out of a dozen lantern plates from twelve negatives of varying density. I am well content if I can produce six decent slides from a box of lantern slides. The six "wasters," however, come in well for cover glasses, and, as glass of the same quality would cost retail from 4*d.* to 6*d.* per dozen, no pecuniary loss is incurred."

SURGEON-MAJOR J. L. VAN GEYZEL, M.B., F.I.C.

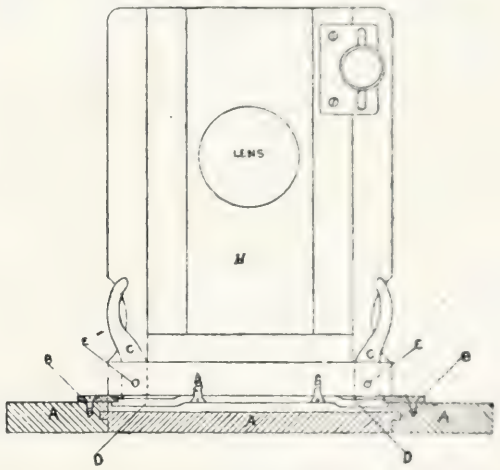
COLOUR PHOTOGRAPHY.

[Nature.]

AN important paper on the theory of colour photography is contributed to No. 6 of *Wiedemann's Annalen* by Herr Otto Wiener. The paper deals with the methods of attacking this problem which are based, not upon the photography of the different constituents of coloured light and their subsequent recognition—like Mr. Ives's heliochromy and similar processes—but upon the direct production of colour by the influence of light upon certain chemical substances. The most recent, and in a way the most successful, of these methods is that due to Lippmann, and the question raised by Herr Wiener is whether the old processes invented by Becquerel, Seebeck, and Poitevin are based upon interference colours like Lippmann's, or upon "body colours," *i.e.*, colours produced by partial absorption of the incident light. That Lippmann's colours are due to interference may be very simply proved by breathing upon a plate with a photograph of the spectrum, when the colours quickly wander towards the violet end, this result being due to an increase in the distance between the nodal layers. This experiment cannot be applied to a spectrum photographed by Becquerel's method. But Herr Wiener succeeded, by a simple and ingenious contrivance, altering the path of the rays through the coloured film by placing a retangular prism on the plate, with its hypothenuse surface in contact with the spectrum. This experiment had the startling result that that part of the spectrum covered by the prism appeared strongly displaced towards the red. Hence Zenker's theory of Becquerel's process, enunciated in 1868, which ascribed the colours to interference, is substantiated. Instead of Becquerel's homogeneous sheet of silver chloride containing subchloride, Seebeck used the powder, and Poitevin mounted the salt on paper. In these two processes the effect described is not observed. Hence these colours are body colours in these two cases. The production of these body colours is a very mysterious process, but the author hopes that here will eventually be found a satisfactory solution of the problem. To account for the production of these colours, he advances a remarkable theory which has a well-known analogy in comparative physiology. Given a collection of compounds of silver chloride and subchloride of indefinite proportions, such as those which Mr. Carey Lea calls by the collective name of "photochloride," we must suppose, according to the modern kinetic theories, that they are undergoing a rapid series of successive modifications. When the red combination happens to be exposed to red light, it reflects it without absorption, and will therefore no longer be affected or changed by it. Similarly for the other cases. This is another process of "adaptation." The author describes some experiments which prove that this is the true explanation, and points out the importance of this view, not only for colour photography, but for the production of colours in the animal world.

SPRATT BROS. "S. B." PATENT CAMERA.

ONE of the chief features of this camera is the new and entirely novel method of fixing the camera front. It is constructed as follows:—A strong brass plate spring, D, is fixed on the base of the camera front, H, the ends of which exert their pressure upon the under side of the brass runners, B, on the base of the camera, and clamp the said runners between itself and the bottom end of the camera front, holding it securely and firmly in position. To release the camera front from its fixing, it is only



necessary to depress the protruding portion of the levers, C, on either side of the camera front, which is done in the simple act of taking hold of the camera front with the thumb and finger. The square ends of the said levers are thereby caused to protrude slightly beyond the bottom end of the camera front, and consequently pushes away the plate spring, D, releasing its hold upon the brass runners, B, thereby rendering the front perfectly free to be moved in either direction; when, however, the proper point is reached where it is desired to fix the front, the *simple act of letting go* the front renders it immediately rigid. It will be seen that all bolts and loose nuts are hereby entirely dispensed with, and an exceedingly comfortable, ready, and reliable means of fixing the front in position is attained. We are assured by the patentees that provision is made to apply the same principle to the best form of cameras, including those with swing front, the necessary variation being provided for under the same patent.



The same idea of self-fixing is here introduced to the camera, which this firm have so successfully applied to camera stands, which have now become so well known as the S.B. Patent Self-fixing Tripod.

Messrs. Spratt Bros. are manufacturers to the trade only, but their stands and cameras can be procured from any dealer.

HAND-CAMERA EXPOSURES.

[Anthony's Bulletin.]

The hand camerist is here to stay, and indeed he has so far outstripped his tripod brother numerically that the latter is as scarce as the ferrotypist. The hand camera is an instrument capable of very wide application. It gives to the photographer a power that a few years ago would have been considered miraculous. Abuses of this power have been few, and, indeed, photographers generally view with disapprobation the too free use of the hand camera. The question has been asked, Where will the development of the hand camera stop? First, Daguerreotypes, then wet plates, and slow dry plates, and now plates and shutters working at phenomenal speeds. There seems to be no point where it can be said the end is reached. The value of extremely rapid exposures for ordinary work may be questioned, yet, for scientific work, high speeds are necessary, and the wonderful advances in apparatus and plate-making seem to point to still further developments in the near future.

At present the climax for amateur work seems to be the combined hand and tripod camera, adapted for the use of plates or films, or both. The many ingenious contrivances, devised to secure the utmost simplicity and exactitude, have so far relieved the photographer of any attention to working details, that he may devote the necessary attention to the vital questions of exposure and selection of subject. Unfortunately, most hand-camera workers regard their instrument as capable of anything and everything, and shoot away with utter disregard of the most necessary precautions. Very few of them have any idea of the speed of plate and shutter, and of the size of the diaphragm employed. Few of the ordinary hand cameras have the ratio of aperture to focal length marked on the diaphragms, and the possessors of those that have oftentimes regard them as some private marks of the manufacturer. The exposure meters, to which we have many times called attention, should be universally adopted. They are easily manipulated, and are compact and portable. Wynne's exposure meter is of the shape of a small watch, and in one movement the correct exposure may be found. And, in this one movement, four factors, all of which are usually neglected by the amateur, are considered, namely, the intensity of the light which illuminates the subject, the diaphragm or stop employed, the character of the subject, and the sensitiveness of the plate used. Remember, that unless a plate receives sufficient exposure, a good negative cannot be obtained. No developer can create, that is, get out of a plate an image which is not there.

By the aid of the exposure meter it is, of course, possible to get a batch of plates or films exposed so nearly correctly that development is a comparatively simple operation. But the product of the ordinary hand camerist is usually a lot of exposed plates, some over-timed, others (most) under-timed, and a very few timed correctly. If the same plates, diaphragm and shutter speed are employed from ten a.m. until six p.m., identical effects on the sensitive surface cannot be looked for. Time and again have we seen the amateur urged to carry along an exposure notebook, and make a record of his work. In tripod days this was often done, but to-day the photographer who conscientiously records each exposure is a rarity. And so he will be, and perhaps should be. It is often impossible to make notes, and, if the exposures are made with the aid of a meter, it is usually unnecessary.

Given, however, a batch of plates or films, exposed with or without the assistance of an exposure meter, how shall the beginner proceed? The dark room is probably an improvised one, the facilities of the poorest, the temperature high, and the photographer in a hurry—all militating against good results. The dark room should be as roomy as possible; everything should be ready before white light is excluded; a yard or two of thin rubber cloth should be spread over the table used; ice water should be handy, and there should be no hurrying. Confusion of any kind, anywhere, leads to failure. If films have been used, it will be found best to take a piece of glass about the size of the film, and fasten this latter to it by the aid of two rubber bands, one over each end. Films thus treated may be developed similarly to plates. A preliminary soaking of the plate in water is often recommended. There seems to be no good reason for this, and it has been stated by authorities that many cases of "pinholes" have been traced to it. If a sufficient quantity of developer is used, the plate can be quickly covered and lines and other markings easily avoided.

With such exposures as we have selected, tentative development is the only method that will ensure good results. To place a dozen different exposures in one solution means obtaining a dozen widely differing negatives. Every beginner will, doubtless, try the new developers, and may succeed in getting many handsome-looking negatives. A very handsome negative nearly always yields prints having too much contrast. Those developers for which it is claimed that the negative "jumps out in a flash" should be let alone. Flashes are good in their place, but for a good negative, careful watching and handling are necessary during the whole process of development. Pyrogallol, with sulphite and carbonate of soda, gives negatives that cannot be excelled, and the action of the developer can be so easily changed that increased detail or density can be obtained with great facility. Many formulas might be given, but all are useless. True, all will develop, but the formula of the developer necessary for a certain exposure cannot be set down beforehand. Having the plate developing, such additions must be made to the developer to bring out all there is in it. Of course, when exposures have been made with the aid of the exposure meter, that is, when the sensitive film has in all instances been acted on equally by the light, a formula, once proved satisfactory, may be relied on as the proper thing; but when, as is usual, the exposure has been a matter of guess work, a different formula is necessary for each plate if the best possible result is to be obtained.

KODAKS AS ENLARGING CAMERAS.

[Kodak News.]

In our last article we described how Kodakers could extract further pleasure from their Kodaks by using them as enlarging cameras, and thus produce large and beautiful pictures on bromide, nikko, and other papers. We propose now to talk about the *time of exposure* required when using each size of Kodak, and to smooth away what might seem to be difficulties in the way of the beginner.

The time of exposure required in making an enlargement on bromide paper is necessarily uncertain, especially when daylight is used, and is dependent on many circumstances.

1. The intensity of the light.
2. The strength or density of the negative.
3. The size of the enlarged picture.
4. The size of the Kodak.
5. The size of diaphragm or stop used in the lens.
6. The bromide paper used.

The Kodaker must not be appalled by this seemingly formidable array of conditions, and need not for a moment despair of ever judging correctly in every instance.

While it is true that, in order to obtain the very finest results, a knowledge of all these is necessary—and such a knowledge as can only come to one by careful observation and practical experience—perfectly satisfactory pictures can be made by the beginner. A very few trials will narrow the exercise of judgment down to the intensity of the light, and in the first number of the *Kodak News* we have already shown how, in a simple manner, a test exposure can be made.

We have taken each size of Kodak with largest diaphragm or stop in position, and, from a film negative made with the same size of Kodak produced, in the manner described in Number 1 of the *Kodak News;* by its means a 15×12 enlargement on Eastman's extra rapid bromide paper, using daylight of such intensity as is usual between the hours of 11 a.m. and 4 p.m. during the month of May in the west end of London, and, after focussing the picture, carefully noted the time of exposure necessary to give the best result.

The No. 2 Kodak required 60 seconds; the No. 3 Junior, 40 seconds; the No. 3 Regular, 30 seconds; the No. 4 Junior, 15 seconds; the No. 4 Regular, 20 seconds; and the No. 4 Folding, 10 seconds.

These times are not given as absolutely correct, for everybody and in all places, they were correct when we made our enlargements. As everybody knows, the intensity of daylight is ever changing, and is of better photographic value in, for instance, the country than in the heart of London, and it is because of this that no hard-and-fast rule can be laid down. Still, as a guide, the times will be found sufficiently correct, for Eastman's bromide papers allow of considerable latitude in exposure.

The No. 2, No. 3, and No. 4 Regular Kodaks, having a great length of body, will have to be used in a slightly different manner from the other Kodaks. It will be found that, in order to bring the lens sufficiently near to the negative, it will be necessary to place the Kodaks in such a position that the lens is pointing towards the negative, instead of towards the easel. It will be discovered, too, that in the case of the No. 2 Kodak a full-sized circular enlargement cannot be obtained, the body of the Kodak cutting off some of the picture, but a pretty dome-shaped picture can be made which would be preferred by most people to a round picture.

The No. 3 and No. 4 Regular Kodaks will also, on account of their great length of body, cut off a little of the picture unless the milled-head focussing dial be set as far past the 100 feet as possible. The focussing in this case, when making the enlargement, should be done by moving the Kodak backward and forward.

A NOVEL COMPETITION.

The Boston Camera Club, representing a gentleman of high standing in matters pertaining to aërial navigation, is authorised to make the following offer of prizes for instantaneous photographs of large soaring birds:—

A prize of $100 is offered by the Boston Camera Club for the best instantaneous photograph of a large bird in the act of soaring.

An additional prize of $50 is offered for the greatest number of instantaneous photographs, offered by one photographer, of large birds in the act of soaring. By "soaring" is meant the attitude of the bird in the air when no wing motion is apparent.

Photographers throughout the world are cordially invited to compete.

This offer remains open until October 1, 1896; but, if on that date at least 100 different photographs have not been received, the limit of time may be extended, of which due notice will be given.

All contributions should be sent to the Boston Camera Club, 50, Bromfield-street, Boston, Massachusetts, U.S.A., and marked "Cabot Competition."

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*September 6, 1895.*

THE LANTERN RECORD.

CONTENTS.

	Page
THE SEARCH LIGHT. By RADIANT	65
ELECTRIC LIGHT FOR LANTERN WORK. By CECIL M. HEPWORTH	66
PHOTOGRAPHY BY LIGHTNING. By W. LINDSAY	67
LANTERN MEMS By G. R BAKER	68
A NEW METHOD OF MAKING LANTERN SLIDES	69
HEPWORTH'S ARC LAMP FOR THE OPTICAL LANTERN	69
A MAGNESIUM TORCH. By G. M. HOPKINS	70
HAVE TELESCOPES REACHED THEIR LIMIT?	70
THE CARE OF THE OIL LAMP	71
ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES. By JOHN H. JANEWAY	71
THE KINEMATOGRAPH	72
ON A PHYSICAL THEORY OF THE PERCEPTION OF COLOURS. By GEORGES DARZENS	72
THE AMERICAN LANTERN TRADE	72

THE SEARCH LIGHT.

Aluminium is being put to constantly extended uses in the construction of optical lanterns, from those which are mainly devoted to scientific projection purposes, down to the humble singles that are used simply for straight-through projection. I am informed, however, that aluminium does not stand the heat as well as could be desired.

* * * * *

The spell of fine weather, with which August closed and September opened, has apparently had the effect of delaying the commencement of the winter campaign among those interested in lantern matters. "Nothing doing yet" has been, in effect, the reply of several members of the trade who were asked how business stood with them. The delay in the issue of the report of the Committee appointed by the ex-Home Secretary, Mr. H. H. Asquith, to inquire into the use of compressed oxygen in cylinders, has also had a slightly paralysing effect on dealers and public.

* * * * *

Probably the feature of the season, when it has opened, will be that very great attention will be paid to electric arc lamps. More than one model—manifestly improvements on those already in use—is, I understand, to be introduced, and, with the growth of facilities for obtaining current supply, the battle of electricity *versus* oxy-hydrogen may be said to have begun in real earnest.

* * * * *

The brilliant lightning storms that took place last month were not allowed, by innumerable photographers, to pass without attempts being made to secure records of the wonderful phenomena of electricity that were revealed to us. Photography by electric light acquired a new meaning on those memorable evenings. Apart from the many photographs of ribbon lightning that were taken, and which no doubt will chiefly be of interest to meteorologists, a more direct photographic interest will centre in those views and landscapes that were taken by "electric light," especially during the second of the two storms mentioned. Some of those that I have seen are really remarkable, all things considered, as photographs, the best probably being that kindly sent me by my old friend, Mr. W. Lindsay. This is a rural view, with a cottage and other buildings in the foreground, trees, meadow and cattle in the middle distance, and trees in the distance. Where the roof and roadway have formed reflecting surfaces from the presence of the rain, the detail is perfect, and the remainder of the photograph, if less well defined, is a remarkable attestation of the power of the illuminant, being, comparatively speaking, fairly well exposed.

By the way, the "new" school of photographers show themselves so adverse to the production of photographs bearing evidence of having been produced by that (to them) unfashionable illuminant, the sun, that it is to be hoped they took advantage of the August storms for securing some "things" after their own hearts. Some novel and unorthodox effects of lighting were to be obtained, as well as, to judge by Mr. Lindsay's curious photograph, some eccentricities in the way of focal treatment—sharpness, as already pointed out, being governed by the extent to which the rain was not absorbed.

* * * * *

The slight advantages of portability and lightness of the conical bellows form of landscape or tourist camera, are so obviously outweighed by the disadvantages that frequently the taper bellows cuts off a portion of the picture, that often in the matter of the rise and fall of the lens front a too limited range is possessed, and that this kind of camera, besides allowing of comparatively little or no lateral movement, is also useless for stereoscopic purposes, that there is real cause for surprise at the camera-makers continuing to favour such a form of instrument. To all but the rawest amateur it is manifest that the square-built camera is dictated by theory, and rendered indispensable in practice, and even he, in course of time, is bound to find this out for himself.

* * * * *

But that even the square form of camera is susceptible of improvement in one very important detail has occurred to Mr. J. Cole, who is placing on the market a camera, square, of course, to which he has fitted a *flexible* rising and falling front. This is actuated by milled-head screws on the front of the camera, and its action and effect will be understood when I say that it permits of the lens being raised to the extreme top or lowered to the very bottom of the plate. The "front," which may be compared to the reeded shutter of a dark slide, is so wound over the top or under the bottom of the camera as not to protrude, or be in the way to the least extent.

* * * * *

The practical photographer will at once see the great leverage which Mr. Cole's flexible rising and falling front gives him. At a stroke it abolishes the swing back. Its use in architectural work is clearly great, and, provided the camera be levelled, no distortion need be apprehended. Not only does it demonstrate its efficacy for getting in the top of a high building at close quarters, but the exact reverse obtains, and, where necessary, the ground almost under the lens can be got in. In fact, this power of being able to direct the axis of the lens to any portion of the central vertical dimension of the plate gives one a degree of control over the included subject such as is probably not possessed by any other form of lens front. When the camera is ready for sale, I have no doubt it will be very popular.

* * * * *

I should say that Mr. Cole, who is a very clever stereoscopic worker, found out by practice the need of having this control over the raising or depression of the lens.

* * * * *

What Mr. J. S. Teape, in his chatty delegate's report of the Shrewsbury Convention, terms "the distinguished Society known as the A. M. S.," has received a stab in the back from a writer in a con-

temporary, who finds it less difficult to conceal his malice than his identity. He first asks what the "A. M. S." is, and then, without waiting for an answer, proceeds to hint that this select but harmless little Society is not elevating in its object or membership. Any cur behind a fence can bark or snap, and in this case it is not venturing much to hazard the opinion that this particular mongrel not having been found to be a *persona grata* by his species has valiantly taken his revenge behind the fence of anonymity. Poor fellow!

* * * * *

The hint I gave photographers two months ago to become anglers, and so place themselves in the position of legitimately profiting, where opportunity offered, by the concessions anglers occasionally enjoy in the matter of reduced fares for railway travelling, has elicited one or two comments, which, to put it mildly, are more remarkable for wisdom than justice. A daily newspaper calls it "fraud!" "Fraud" for a photographer to combine angling with his camera work, and secure and enjoy an angler's privileges! Hoity-toity, what next? "Free Lance," again, is of opinion that it would not be an honourable mode of getting a free ticket! My original hint ran: "*There is, of course, no regulation forbidding the angler, when undertaking one of those privileged journeys, also carrying a camera, so that the combination of photography and the gentle craft is not only permissible, but desirable from a financial point of view.*" What could be "fraudulent" or "dishonourable" in such a proceeding?

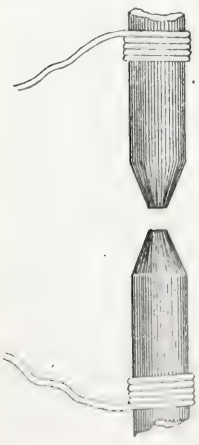
RADIANT.

ELECTRIC LIGHT FOR LANTERN WORK.

The increasing use of electricity for lighting large public buildings, and also private houses, leads us to hope that, before long, suitable current will be obtainable on nearly all occasions where limelight is at present the only resource. The very great superiority of the electric arc light at its best over any form of limelight, not merely in the matter of quantity of illumination, but in colour and quality generally, is now a matter of common knowledge. When not at its best it is simply abominable—a state of affairs which is always attributable either to a faulty lamp or an incompetent lanternist. It is necessary that certain initial details should be mastered—not a very difficult matter—and then the management of an electric lantern is more simple and satisfactory than any other.

There is another reason why the fullest attention should be given to the claims of electricity as a rival of the limelight, and that is, that the recent explosion of a gas cylinder at a London railway station has raised so much unreasoning alarm in the public breast, that the London County Council are imposing prohibitory conditions upon the use of compressed gasses in public halls, while several railway companies are refusing to carry charged cylinders except under difficult conditions. It is well known that the very great increase in the optical lantern's popularity of late years is largely due to the introduction of the compressed gas system; and should these obstacles to the use of cylinders be continually placed in our way, it behoves us to test to the utmost every new illuminant which presents itself, unless we wish to see the present popularity of the lantern decline.

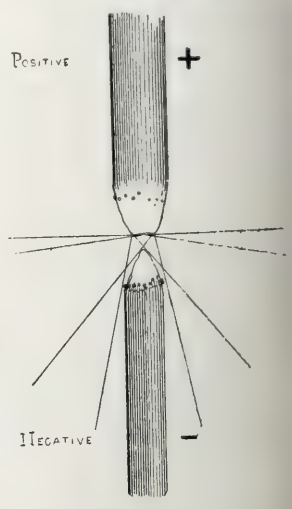
The electric arc light at its best is far and away the most suitable illuminant for all optical purposes, for not only is it the most brilliant, but it is also the smallest of all the available sources of light—a matter of extreme importance. The light is caused, firstly, by a stream of electricity, which, under certain conditions, bridges across a gap between two electrodes; and, secondly, by the incandescence of the ends of the electrodes themselves, which become intensely heated. The material of which the electrodes are composed plays a very important part. Copper, for instance, yields a brilliant green light; iron, a pale blue; mercury, a beautiful white. The metals, of course, become fused by the heat, and they give off disagreeable fumes, those from mercury being highly poisonous. Carbon, far more refractory than any metal, is practically the only suitable material. Electricity, at the pressure used for lighting purposes, will not bridge across a gap of cold air of more than a thousandth of an inch or so; but, if that gap or space between the electrodes be filled with carbon vapour, which is a partial conductor, it will bridge the space, forming the highly luminous electric arc. In order, therefore, to produce this amount of carbon vapour, it is necessary that the two carbons should be allowed to touch for a moment, and then be separated to the right distance. At the moment of touching the contact is insufficient to allow the large current of electricity to pass; a small quantity of carbon is vapourised by the heat, which is always developed when resistance is offered to the passage of electricity; the current is thus enabled to bridge the very small space which is first introduced between the carbons, then greater heat is produced, resulting in more carbon vapour, and thus the space can be gradually increased to the full extent. In practice, this all occurs so rapidly that the whole operation occupies only a small fraction of a second.



Having established the arc, the next fact which engages our attention is that the two carbons gradually become consumed, and it is in order to compensate for this gradual burning away that it is necessary to have some kind of lamp or regulator. It is a mistake to suppose that the regulator performs any function similar to that which a lamp performs for paraffin. Indeed, the two carbons with wires attached might be just as well held in one's hands, only providing one could hold them sufficiently steady. And this brings us round easily enough to a consideration of the fact that the great unsteadiness and flickering, often so very noticeable in connexion with the electric light, is almost always entirely due to the instability of the two arms or carbon holders whose function it is to maintain the carbon points at their fixed distance from one another. I say "almost always," because it sometimes happens that, in small installations, the current itself is unsteady, and in that case the most perfect regulator cannot prevent the light from fluctuating.

All automatic lamps or regulators depend for their action upon the fact that the greater the length of the electric arc, the greater the resistance to the passage of electricity, for the amount of current in any circuit is inversely proportionate to the resistance of the circuit. The electric current, after passing across the carbon points, goes through the coils of an electro-magnet, which is, of course, either weaker or stronger according as the arc is longer or shorter. So far, all regulators are alike; it is in the application of the power of variation thus gained to the shortening or lengthening of the distance between the carbons that the various lamps differ. The striking of the arc in the first place is accomplished either by this feeding mechanism or by an independent magnet armature, acted upon by the same principal electro-magnet. In the majority of lamps, one carbon only is fed forward, the other one is stationary. Lamps in which both carbons are fed forward so as to maintain the arc in one position are known as focussing lamps, and this is, of course, the only suitable form for optical purposes. For lantern work it is not necessary that the lamp should be automatic. The feeding may just as well be accomplished by hand.

When an electric lamp is started and allowed to burn for a few minutes, certain peculiarities are noticeable. It will be seen that one carbon burns to a much sharper point than the other. Closer examination will reveal the fact that the blunter-pointed carbon has a small hollow, or crater, as it is technically called, just opposite to the nearest point of the other carbon, and that tiny incandescent particles are continually being projected from this crater upon the pointed end of the opposite carbon. These particles then join forces with the pointed carbon and augment it to a considerable extent. Bearing this fact in mind, it may be guessed that the pointed carbon will not wear away so fast as the other; and, as a matter of fact, it is only consumed at half the rate. To meet this condition of things, it is essential, in order to maintain a focus, either that this carbon be fed forward at twice the rate of its opponent, or that it should be half the thickness, so as to equalise the rate of burning. It will be seen later that there is, independently of this, an important reason why the pointed carbon should be smaller in diameter than its fellow. The carbon that has the crater is that one which is connected with the positive pole of the dynamo or battery; the negative carbon always burns into a point. In all electric arc lamps for ordinary purposes, the positive or cratered carbon is placed at the top, for the reason that it is the inside of this crater which yields the greatest amount of light, and in that position the light is thrown downwards.

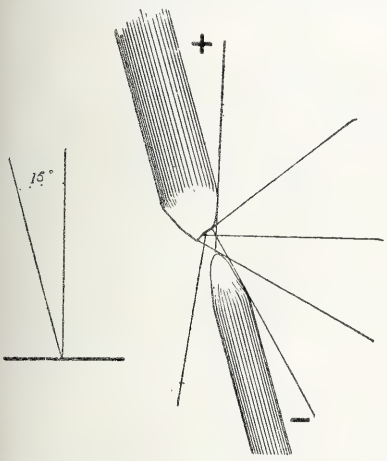


It will be seen that the electric arc light may be considered to have a triple origin. First, there is the highly actinic, but, visually,

not very brilliant, light from the arc itself. Secondly, there is the glow from the incandescent point of the negative carbon; and most brilliant of all is the light from the interior of the positive crater. So, the thinner the negative carbon is, the less of that light will be obstructed by it and lost.

But for optical-lantern purposes we do not want a light thrown out on all sides and in a downward direction. We want a light on one side only, and directed horizontally—in fact, as like as possible to the limelight.

This condition the electric light may be made to fulfil by a little manœuvring. The whole arrangement must be tilted slightly, so that the brightest light from the positive crater be projected in a horizontal direction at one side, and then, if the upper carbon be set slightly behind the other, the crater, forming, of course, opposite the other carbon, will be directed full towards the lenses, and a very little light will be lost at back and sides. The extent of this displacement, and the amount of tilt necessary, depend to a certain extent upon one another. If either be overdone, the point of the negative carbon will cast a shadow upon the upper portion of the sheet. If the displacement be not sufficient, the light will not be directed upward enough to properly illuminate the lower part of the picture.



It is most important that a lamp for optical-lantern work should have a means for easily adjusting the backward displacement of the upper carbon while the lamp is burning, for it is seldom possible to set the two carbons so accurately in the first place that their relative positions shall be exactly the same at the conclusion of a performance as they were at the beginning. There is only one best position, and any variation from it means loss of light, and should be instantly corrected. Unfortunately, in almost all the lamps at present on the market there is no provision for this important adjustment.

The great majority of electric lamps available for optical purposes have been designed by electricians, and not by lanternists, and the consequence is that all those little comforts and conveniences which would otherwise be included, and which are indeed necessities to perfect working, are simply ignored; while in those few cases in which a lanternist has been the moving spirit, the result is often so faulty, electrically speaking, that a good and steady light is generally a practical impossibility. One of the absolute necessities which is usually lost sight of is a means of readily raising or lowering the point of light. It is impossible to get carbons so accurate in point of size that any two can be relied upon to burn at a precisely equal rate. An unequal rate of burning means, of course, a displacement of the light-centre, and the veriest tyro in lantern work knows what terrible havoc *that* will play in a lantern performance.

The next important point which claims attention is actual length of the arc itself; that is to say, the distance between the carbon points which yields the best results. This length of arc is of much the same importance to the electric light as it is to the limelight that the jet should be supplied with the correct proportion of the two gases. It is very difficult to give any definite directions as to the distance between the carbons, because it is not the sort of thing one can measure comfortably, but I can tell you the symptoms by which you may know whether it is too long or too short. Roughly speaking, it should be from one-eighth to three-sixteenths of an inch, but it varies slightly according to the current. When the arc is too short, a loud hissing and spluttering will very quickly apprise the operator of the fact, and barren and unenviable is that operator's lot if he be unable to remedy the defect. I know, because it happened to me once; it will be some time before I forget it. He will have the pleasure of seeing the audience distinctly interested, not to say perturbed, by the spluttering—a pleasure, by the way, which will be shared by the equally helpless lecturer. He will be able to watch, through the little bit of coloured glass, the point of the negative carbon being gradually undermined, and, seeing a head forming on it with an ever-thinning neck, he will grimly speculate as to whether or not anything will catch fire when that little head falls off and breaks into dozens of white-hot particles, as it inevitably will. This little comedy or tragedy will repeat itself over and over again so long as the carbons remain too near together. Such an unpleasant state of things is, of course, irremediable only in the case of an automatic lamp, and then only when there is no ready means of varying the strength of the current. An automatic lamp must be supplied with the exact current for which it is suited, therefore it is necessary to have in circuit a variable resistance by which it may be adjusted. A short arc is a sign of insufficient current, so the remedy in the above-cited case would have been to lessen the resistance.



On the other hand, if the arc burns too long, it will give an audible signal, but it may be immediately detected by the great diminution in light which always results when the carbons become too far apart. The arc itself, too, exhibits a large orange-coloured flame, such as is seen in the limelight when too much hydrogen is turned on. In the case of an automatic lamp, the remedy is to reduce the current slightly, thereby lessening the strength of that magnet whose duty it is to draw the carbons apart. Of course, where a hand-feed lamp is concerned, this state of affairs merely signifies that it requires a turn of the handle in order to bring the carbons nearer together. If it be neglected, the disease will become aggravated, the arc will flutter and begin wandering erratically round and round the ends of the carbons, and finally go out altogether. Of course, it is only by the grossest negligence on the part of the operator that such a pitch as this could be reached, for a good hand-feed lamp only requires a touch about once every half-minute, and, should it be left entirely to its own devices, it will not actually go out until four or five minutes have elapsed. Of course, the only thing to be done if the lamp does go out, is to re-establish the arc by bringing the carbons together for a moment, and then separating them to the right distance.



CECIL M. HEPWORTH.

PHOTOGRAPHY BY LIGHTNING.

THREE forty-five *a.m.* on Thursday fortnight last found me arrayed in my airy *robe-de-nuit* at the open window, engaged in the novel and exciting task of attempting a photograph by lightning. But, although that attempt proved a failure, it served as a full-dress rehearsal for another attempt in the evening of the same day which did give a result. The early morning attempt in fact saved me from a second failure, for imbued with the idea of instantaneous exposures, I learnt the utter impossibility of such from a variety of reasons.

On this occasion sunrise was only distant about an hour, and already, although it was not daylight, there was sufficient "grey" in the sky to give the idea that anything like a prolonged exposure would impress the plate without the aid of lightning. The subject was an avenue of trees principally of the pine class, running straight away from the window, with the clear sky in the distance. The lightning so far as I could see it was all sheet and almost continuous a regular throbbing of flashes varying only in intensity. After watching for some time, I found it was scarcely possible to hope to get the details of the trees in the avenue adequately lighted in consequence of their position and the direction of the storm, so at length I made an exposure of about five seconds which covered perhaps three or four pulsations of light of no great brilliancy. Result on development, the faintest possible image of the sky.

Shortly after nine *p.m.* another storm commenced, accompanied by torrents of rain. The conditions on this occasion were in every way favourable for the object I had in view. The flashes were frequent and brilliant, and the night otherwise so intensely black that standing behind the camera it was impossible to make out the sky line. This time I selected a tolerably open view from another window, the foreground consisting of a grass lawn, surrounded by an ivy-topped wall of grey flint with a white-painted wooden gate. Behind and close to, some farm buildings of tarred wood, surmounted by thatch with the exception of a tiled granary, the principal object at close quarters. Beyond this, gravel road sodden with rain and a stretch of open meadow, with a background of trees and cabbages about three furlongs away.

A very brief survey of the scene showed that, although the lightning was almost continuous, three or four separate storms proceeding simultaneously in different directions, not one in ten or more of the individual flashes gave any useful illumination to the landscape itself; and though many of them, especially those of the "forked" or zigzag description, appeared, by contrast with the intense darkness, intensely brilliant to the eye, it was only the sky that was illuminated, terrestrial objects being only thrown into a mass of intense shadow. Occasionally, when a bright flash came in the right direction, the landscape itself was clearly lighted, and minutest objects were as plainly visible as in broad daylight; but, even in contrast with the darkness, the apparent brightness was far inferior to the storm of the 10th instant. To calculate by a time exposure was, of course, useless; the only plan being to uncap the lens and wait until the landscape was judged to have had sufficient illumination, leaving the sky to take care of itself.

The first exposure was made in this manner, and lasted about five minutes, during which period the individual flashes were very numerous and brilliant, including "sheet," "fork," and "ribbon," but only three gave any useful lighting to the landscape. The lens was a rapid rectilinear working at *f*-20, and the plate a "rapid" one. A second exposure was made in the same manner and under the same conditions, except that *f*-16 was used, for the strength of the brief storm was waning, and it took over a quarter of an hour to secure three flashes that lit up the landscape, and these were inferior in brightness to those of the first exposure. On this occasion, too, there were several streaks of ribbon lightning that came within the field of view, one of especially vivid character, sufficiently so to impress itself distinctly on the plate through all the numberless flashes of sheet that rendered the sky, on development, as clear as a day sky. In fact, this particular streak was the only one of the many that registered itself, the others being obliterated by the superabundance of sheet.

On development, the two plates were about equally exposed, but the impression of the details of the landscape was of the faintest description, although the result is a very fair transcript of the scene as it might be expected under the circumstances. After the sky, the most strongly impressed portions of the subject are those that were capable of holding the rain to form a reflecting surface—the flooded roadway and the grass in the open meadow. The trees, even in the far distance, are quite without detail, although the grass and the dark woodwork of the farm buildings in the immediate foreground are clearly, if faintly, defined. But the strongest evidence that the bulk of the work is due to reflection from the wet surfaces is found in the contrast between the tiled and thatched roofs in the foreground; the former, streaming with wet, is almost the strongest light in the picture, while the more absorptive thatch is scarcely visible, although the two from their position were equally well—in fact, identically—lighted.

One curious fact remains to be noted, as tending to prove that the individual flashes when they fall in the right direction possess considerable actinic value. During the second exposure a solitary cow wandered into the field of view and appeared to be calmly browsing or ruminating, seemingly oblivious of the storm going on around it. In the photograph it is clearly rendered in duplicate, the two representations being several yards apart, as if caught by distinct flashes. Another point that is worthy of notice is the entire absence of halation, considering the quantity of intensely bright light that went to form the sky. Yet the outlines of the trees are cut as clearly against the sky as it is possible to imagine—far more so, in fact, than is the case in a daylight picture of the subject taken upon a similar plate.

In conclusion, let me say that the pictures were developed immediately after exposure, fixed and washed as rapidly as possible, and when reared up to dry on a marble mantelpiece (no fire in the room) were mechanically perfect so far as freedom from flaws is concerned. In the morning they were partially dry and covered over with circular transparent spots varying in size up to nearly an eighth of an inch in diameter. There was a slight renewal of the storm during the night, so I imagine there is a good deal of truth in the suggestion made a week or two ago as to the injurious action of thunderstorms on gelatine films.

W. LINDSAY.

LANTERN MEMS.

AMONG the many announcements for the coming lantern season, including new lanterns, new electric arc lamps, new saturators, new carriers, and many accessories of the lantern, we have as yet no authoritative statement as to the Home Office inquiry into the gas-cylinder question and continued use of compressed gas under old conditions, and we shall have to wait a month or so for this. Fortunately the railway companies are getting settled down to a quieter state of mind, and have amended their decision with regard to the collection of cylinders.

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THEY now no longer insist on the cylinders being delivered by the consignor to the respective goods station, but, on being written to, will collect from the optician or agent's place and carry in their own vans to the depot and deliver at other end to consignee. This removes one serious hindrance to business, and, if users of gas allow sufficient time (say, a day extra) when sending cylinders to be filled to permit notification to the particular company on whose line the cylinders are to be conveyed, the work can go on in the same smooth way as originally. It must, however, be understood they still object to receiving cylinders at district or collecting offices, nor will they allow them to be taken by collecting vans.

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THE certificate of guarantee has still to be sent with each cylinder, as settled by the railway companies' engineers some time since; but, as the above modification in the carrying conditions has been made by the railway companies unsolicited, as far as I understand, it looks promising, and one cannot but think they will carry the matter to the only logical conclusion, viz., carry a certified cylinder anywhere and everywhere without let or hindrance after proper declaration. Now, as it stands, it is quite safe to carry a cylinder by passenger train if it passes through the booking office and a fee is paid, but it is *not* safe if it is taken otherwise into the train. Also, apparently, it is quite safe to take it by one kind of their carrying vans, but not another; it is also quite safe to be on their premises, in the parcels office, and on the way there, but not in the ordinary booking office with the passenger. The whole matter is so illogical that it cannot go on long as it is.

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I HEARD within the last day or two of a very amusing incident. Some lantern entertainments were arranged to be given in Guernsey, and the railways refused to carry the compressed gas by their steamers, but arrangements were made for a sailing vessel to do so. They arrived in due course, but the Customs authorities would not allow them to be landed, except the formalities were gone through the same as was usual with gunpowder, dynamite, and other explosives, and when duly cleared were conveyed through the town on a trolley, headed by a man carrying a red flag. My informant said he should not have regretted the time absorbed, or the trouble caused, if they would have allowed him to carry out his suggestion and write in bold letters on the flag "Bank's Panorama," for then he could make an advertisement of the procession. Perhaps on some future occasion, if these regulations remain in force, he, or others in a similar position, will be able to make some bold announcement conspicuous in the procession.

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IF I am rightly informed, the railway companies have virtually promised to reconsider the whole question when the Cylinder Committee issues its report; but, as all professional matters are at a standstill for the month on account of the holiday vacation, the Committee, like most people just now, are endeavouring to get a store of health laid up for the coming winter by change of air and scene, on the mountains, on the sea, at the seaside, or with the sportsmen on the moors; and so lanternists must exercise patience, and simply regret that the deliberations did not commence earlier, so that the report could have been issued before they started and arrangements made by those so closely connected with the gas-compression industry at the commencement of the lantern season.

It seems curious that reference should have to be made at all to "care of lanterns and apparatus," but I have on several occasions seen fine instruments almost ruined for the want of a little consistent attention. For instance, in the case of limelight apparatus, the broken limes are allowed to remain in the lantern until they break up and fill up every crevice; lenses of condensers have been scratched, and jets knocked about, tubing allowed to get hard, and consequently with a tendency to cracking and leaking, all of which with very little forethought could be avoided. As a rule, the pocket is the best safeguard against destruction of anything, and if breakages fall on the individual who uses it, or he is the owner, care will, as a rule, be exercised, but it so often happens that the operator is not interested beyond the £ *s. d.* side of the question in the shape of his fee, and he seems to forget that there is such a thing in existence as a feather or cloth duster to remove dust and finger marks, and that crushed-up newspaper or other soft springy paper makes one of the best pads for preventing jarring, or parts inside the lantern body or case getting loose, and so doing damage.

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Photographic Exhibitions, and with them allied is the Optical Lantern, are still with us or announced for opening within measurable distance. Among them, the one always looked to as an event of importance, viz., that of the Royal Photographic Society; then there is the Royal Cornwall Polytechnic Society's Exhibition at Falmouth and an Exhibition at Leeds. The one at the Royal Aquarium is still running, I believe, or was a little time since; but that at the Imperial Institute has come to an end, and the lesson to be learnt from such ventures is for the management of such undertakings to realise that, if success is to be assured, the wishes of the exhibitors themselves must be reasonably studied and practical suggestions favourably considered.

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In some cases Exhibitions are spoilt by the arbitrary conditions imposed, and in others by the parsimony displayed by the management. I venture to think with Photographic Exhibitions, as with theatrical and other displays, a lavish hand, or liberal catering (within reasonable limits), "pays" best in the end, for it must be borne in mind that the optical lantern is now everywhere, and, if a representative Society or special Exhibition Committee expect to "draw" the general public, they must use such apparatus, and show slides of special merit that cannot be seen any week day in schools and small institutes.

G. R. Baker.

A NEW METHOD OF MAKING LANTERN SLIDES.

"In lecturing on experimental psychology," says Mr. E. W. Scripture, in the *Scientific American*, "I have found it useful to project on the screen numerous views from the illustrations in my book, *Thinking, Feeling, Doing*. At first I prepared the slides, at considerable expense, in the usual way by photography, but it finally occurred to me that it might be possible to print directly on glass from the blocks used in the book.

"The electrotypes were obtained, and the glass printer in a clock factory was found to do the work. After several experiments, the correct method was established.

"The metal portion of the cut is mounted on a board of a thickness suited to the particular frame used in the printing.

"It is inked with a fine ink (*e.g.*, a $2 cut or ex-job ink), tempered to the proper consistency with Calcutta boiled oil and japan drier. The precise degree of temper depends on temperature, humidity, and other conditions. The inking is done by a simple hand roller, of the kind used in ordinary printing. The block lies face upward on the table, and the piece of plain glass is placed at the appropriate distance on a level with it. A composition roller of glue and molasses, made a trifle harder than the regular printer's roller, is then run forward on two guides. As it passes over the block it takes the impression. On reaching the glass, after one complete revolution, it transfers the ink impression directly to it. I do not think it possible to run this roller evenly enough without the steel guides; at any rate, it would not pay to waste time in trying it.

"The result is a print on the glass, just as if on paper. Curiously enough, the prints on the glass are superior to those on paper from the same block. The positives are then finished up as lantern slides in the usual way.

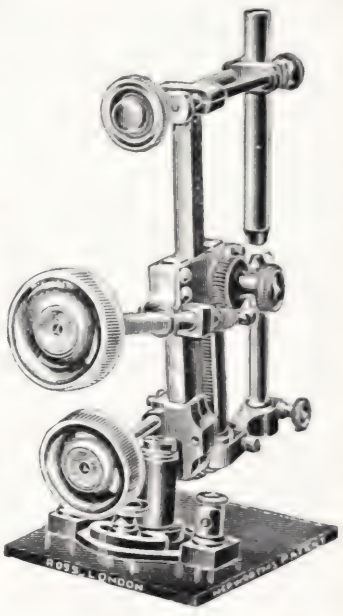
"The superiority of the process lies in its great cheapness. Ordinary slides never cost less than fifty cents each. Prepared in my way, the first slide costs about seventy-five cents, but the future slides from the same block do not cost over five cents each.

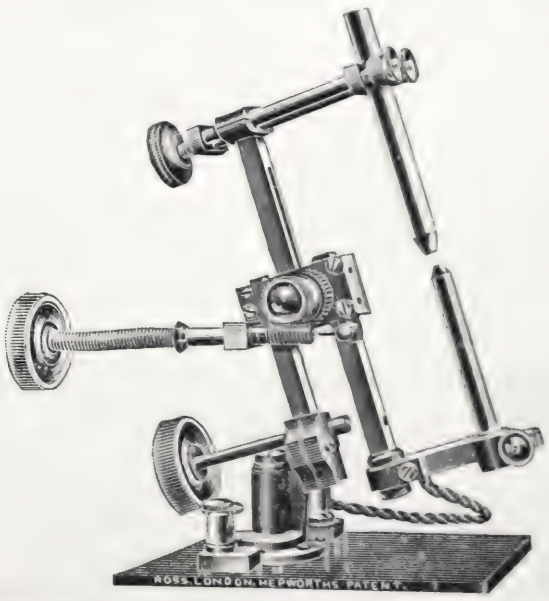
"The possibilities of the method are extensive. The publisher of an illustrated book, for example, can print off sets of slides for lecturers. Lectures on art, botany, geology, history, &c., can be provided at a small cost. Moreover, views not taken from books could be prepared by first turning them into zinc etchings, half-tones, or woodcuts, and then printing from the blocks. The extensive use of the lantern for purposes of instruction in the common schools is impracticable at present, mainly owing to the cost of the slides. With printed slides at a trifling cost the difficulty is removed.

"People often complain that new ideas may be useful, but that, when any one wants to put them in practice it is difficult to find just the proper method. I have given a description that makes the method possible to any glass-printer, or to any one willing to learn by practice. Where such persons are not available, I am willing to put any one into communication with the printer of my own slides."

HEPWORTH'S ARC LAMP FOR THE OPTICAL LANTERN.

Messrs. Ross & Co., of 111, New Bond-street, are just introducing this lamp. It owes its origin to the ingenuity of Mr. C. M. Hepworth, and has several new and, so far as we know, unique features, which should recommend it to the careful attention of lantern workers. It is essentially a hand-feed lamp—that is to say, the gradual consumption of the carbons under the influence of the electric current is compensated by the operator by means of the handle at the back of the instrument. The feeding is very gradual, which is as it should be; for the carbons are only consumed at about the rate of one inch in an hour. In order, however, to "strike the arc"—to establish the light in the first place—it is necessary, as every one knows, that the carbon points should touch one another for a moment; and that brings us to what is, perhaps, the most valuable contrivance in the lamp. Instead of bringing the carbons together by the ordinary slow feeding movement, and then winding back again to the correct burning distance, it is only necessary to push the handle forward, and this will bring the carbons quickly together and immediately separate them to their former distance. As will be seen from the cut, the carbon holders are attached to two racked guide-rods working on either side of a pinion, so that as that pinion turns they move in opposite directions. The pinion is connected with a cog wheel, whose teeth engage with a worm wheel actuated by the feeding handle. When, for striking the arc, the handle is pushed instead of turned, this worm wheel acts the part of a rack, and immediately brings the carbons together. The lamp is fitted with a rack





and pinion for raising and lowering the light centre into the optical axis of the lantern, and it has also a lateral movement. There is a peculiarity about the top carbon holder, too, which will at once appeal to any who have used electric light for lantern purposes. The little handle at the back of the holder is attached to a screw, by means of which the backward displacement of the upper carbon with regard to the lower can be regulated to a nicety. At the close of a performance, when the carbons have burnt short and their holders are near together, they can be quickly separated for retrimming by throwing the worm wheel out of gear—it has a swivelled support—and turning the handle which is connected directly with the pinion. Although the lamp has so many movements and adjustments—and all are necessary—it is not by any means heavy. It is thoroughly well made, and, most important of all, there are no springs to soften with the heat and no parts that are likely to get over-warm.

The Hepworth Arc Lamp for the lantern, strikes us as being far and away the most efficient and practicable yet introduced. It is the outcome of much electric and optical projection knowledge, and we do not doubt that it will be popular. We are informed that its behaviour when recently subjected to actual trial in the lantern was unimpeachable.

A MAGNESIUM TORCH.

Amateur photographers, and some professionals, find in the flashlight a great accession to their photographic properties, inasmuch as it enables them to produce really creditable work at times and in places which would prove disadvantageous if daylight had to be depended upon.

For such subjects as require instantaneous work, the explosive powders are useful, and perhaps in the majority of cases necessary; but for nine-tenths of the work flashlights of the torch type, using pure magnesium powder, without any explosive, answers perfectly, while it has the advantage of producing a less offensive smoke.

A vial three inches high and one inch in diameter forms the receptacle for the powder. The neck of the vial is large enough to receive a small rubber or cork stopper (rubber preferred) having two perforations. In one is inserted a tube having its lower end projecting a quarter of an inch below the stopper, this end being contracted so that its aperture is about one thirty-second inch in diameter, or about as large as a good-sized pin. This tube is curved over to receive the rubber pipe by which the blast is furnished to the apparatus.

In the other aperture of the stopper is inserted a piece of tubing of about three-sixteenths inch internal diameter, and a length of three and three-quarter inches. The tubes may be of glass or brass.

A wire spiral, bent into a circle and connected at the ends, receives a roll of woollen cloth, or, better, a filling of asbestos fibre, and the end of the wire forming the spiral is bent at right angles and wrapped around the tube. A quarter-inch space is left all around the tube, between the tube and the inner portion of the spiral. The vial is one quarter or one half filled with fine pure magnesium powder, and the fibrous material in the wire spiral is saturated with alcohol. When all the preparations for the exposure have been made, including lighting the alcohol, the operator blows strongly through the rubber tube, the concentrated jet stirs up the powder in the vial thoroughly, and the air escaping through the longer tube carries the powder through the flame, thus producing a spire of flame about two feet high. Several puffs may be made if the subject is one requiring strong illumination.

The principal point to look out for is to make the contracted blowpipe of such capacity relative to the discharge tube as will ensure the comparatively slow passage of the powder through the flame. If the blowpipe is too large, the powder will pass through the flame so rapidly as to fail of igniting. In this way a large proportion of the powder may be lost; but, with correctly proportioned tubes, the combustion is very perfect.

The writer has taken a number of fair-sized interiors with this torch. Pure magnesium powder can be used in this apparatus with perfect safety, but explosive powders used in a confined space (such as the vial in this torch) are dangerous.

G. M. Hopkins, in the *Scientific American*.

HAVE TELESCOPES REACHED THEIR LIMIT?

The following is extracted from an article by Professor E. E. Barnard (formerly of Lick Observatory), and addressed from Mount Hamilton, California, to the *University of Chicago Weekly*:—

"Theoretically, you can use almost any telescopic power on the moon; you can bring it so close, theoretically, that you might shake hands with any of its inhabitants who happened to have hands, and who lived there. Practically, you can do nothing of the kind. Those who have used a great telescope know that, from the unsteadiness of our own atmosphere, and from other causes, it is not possible to successfully use these great magnifying powers, even on the moon.

"I think it highly probable that no telescope, no matter how powerful it may be, will ever show the moon clearly at an apparently closer range than 100 to 150 miles, that is, as if it were seen at that distance with the naked eye. True, this is very close, and readily discloses to us the existence of mountains and plains upon the lunar surface. But these we have already seen, though not so well, with the smallest telescope. But at the distance of 100 or 150 miles, can you tell what these mountains are made of? Can you tell the actual composition of the lunar surface? Even the subtle spectroscope cannot tell us this, because the light we get from the moon is reflected sunlight, and an examination of it with the spectroscope will only tell us what the sun is made of.

"This difficulty in using the greatest magnifying power lies, as I have said, in the ever tremulous condition of our own atmosphere. This is, and must always be, the greatest barrier to the work of great telescopes. As our telescope increases in power, it also increases the disturbing effects of this tremulousness of the air, until at last a point is reached where it finally completely destroys the definition and sharpness of the image, and all details are blurred and lost. This holds good, not only for the moon, but for every class of visual work with a great telescope."

In a former article, published some time ago in the San Francisco *Examiner*, on "Chicago's Big Glass, the Forty-inch Equatorial Telescope for the University of Chicago (to be located in Yerke's Observatory at Lake Geneva, in Wisconsin, U.S.A., seventy-five miles north-west of Chicago)," we find the same idea expressed in the article quoted above, "No telescope will ever be built that will give us much additional information about the moon." Professor Barnard concludes his observations on this point as follows:—

"From this it is evident that the forty-inch will give us no further information as to the nature of the substance that forms the surface of the moon. Further details will, doubtless, be added to those we already know—a few more little hills discerned that we may not see with another telescope. But this will not solve the mystery of the moon. These difficulties are due in the main to the fact that our own atmosphere has to be looked through in a more or less disturbed condition. In a small telescope, ordinarily this disturbance is not perceptible, but as we increase the power of the telescope, these quiverings in the air are brought more and more into prominence, until a point is reached where they are so magnified as to destroy the definition. Though the object appears more highly magnified, it is so blurred that it is not as well seen as with a smaller power. Great telescopes are more susceptible to these imperfections of the air than are the smaller ones, so that as we increase the aperture, we have relatively to diminish the effective magnifying power. Besides the atmospheric, there are optical considerations that also tend to lessen the effective power of a great telescope."

It is only too much the practice of scientists, particularly schoolmen, to assume that, because they have reached the limit of their inventive faculties and the end of law as regards scientific attainments at any given period, that further progress is impossible. The bars by which their own progress in this direction is stopped is assumed by them to be insuperable, and that the limit has been reached.

While we were in Germany we expressed the belief, in the hearing of one of Germany's greatest scientific minds, that Edison would solve the question of incandescent lighting, so far as to reduce it to practical commercial form. We were met with the statement, "It is absolutely impossible; certain conditions surround the problem which are insuperable. Why, sir, do you realise what it is that Edison must overcome? He must subdivide the electric current. Surely Mr. Edison and, permit me to say it, sir, yourself, must be strangely ignorant of the laws which govern electricity that you indulge the hope that such a thing can be done. Remember that the electric current must be capable of subdivision before incandescent lighting can ever become a commercial success."

No doubt the great scientist was true, so far as knowledge of electricity went at that time, but Edison did subdivide the current, and incandescent electric lighting has been made a practical commercial success. Professor Barnard assumes that, because in the present state of the art and with the present knowledge of the problems surrounding telescopic observation of celestial bodies are hampered by certain conditions due to the whimsical and changing vibratory action of the atmosphere, and because these quiverings in the air are magnified by the appliances now in use, that human ingenuity and skill in this direction has reached its limit. It is but a short time since that the possibilities of these existing methods have been reached in the construction of a perfect objective, but the mechanical skill attained to manufacture a thirty-six inch objective for the Lick Observatory was produced and a faultless objector of the kind was the result. This has now been increased in the objective for the Chicago University at Lake Geneva by four inches. Nor do we believe that anything like the ultimate possibilities of even a sixty-inch objective are beyond the reach, should such a thing be undertaken in good faith. It seems to be the fashion of millionaires in the United States to dare spending a portion of their enormous surplus wealth in gratifying a whim or a taste for larger and yet larger telescopes, and at the same time to endow them with sufficient funds to make their working and usefulness practicable.

In the case of the Lick Observatory, the atmospheric conditions surrounding it at Mount Hamilton are extremely favourable, more so, we believe, than any other first-class telescope. But surely it must be plain

to the mind of every thinking man that the greater the altitude, providing the surrounding conditions be correct, the less subject would a large glass be to the quiverings and vibrations of the atmosphere. Some of the peaks in the Andes are extremely favourable to the conditions necessitated by these high powered telescopes, and it is not at all unlikely that within the next few years some enthusiastic lover of astronomy may sink his national patriotism in his thirst for knowledge and give to the world, rather than to a single nation, a mighty telescope, placed on some remote mountain peak, found with due consideration to be best suited for the purpose, and there maintain at a height, although it may be within the region of perpetual snow, a corps of trained self-sacrificing and enthusiastic astronomers, who will remap the heavens, and solve many a problem as yet beyond their grasp. It is partly a matter of £ *s. d.*, but not altogether. The money must undoubtedly be forthcoming, but with the money must be human intelligence, large enough and skilled enough to employ the funds placed at their disposal in a manner to accomplish the great object. The limitations of astronomical science have been extended since the establishment of the Lick telescope, and the continued use of the Yerke's telescope will still further widen the horizon of astronomical attainments. Before the century is complete a corps of trained and skilled observators will be ready for the next great advance in instrumental possibilities, and the minds of the astronomers of the next century will be more fitted to deal with whatever problems they may confront. The management of telescopes at a great elevation will, no doubt, be surrounded by many difficulties. These, however, can surely be overcome; and it is hardly too much to expect that, when these are attained, a method will also be devised by which the effect of the air quivering will be, to a large extent, neutralised. We have the greatest faith in the power of the human mind to overcome the natural difficulties placed in the way of scientific research by natural causes. So much has been already accomplished within our own memory in all scientific fields, that perhaps we are over-credulous in our expectations of the possibility of the future. At the same time, however, our credulity rests on strong grounds. Countless impossibilities of thirty years ago are now daily facts for schoolboys, and do not excite wonder, scarcely even admiration, in the minds of any one. We feel, therefore, justified in our belief that the limitations of celestial exploration have not been nearly reached, and that within the next generation a still larger advance will have been made, even over that which we can recollect in our own experience.

THE CARE OF THE OIL LAMP.

A REMARK made recently by one of the most successful lanternists induces us to repeat some of his opinions. "An oil lantern," says *The Exhibitor*, "is of value only when it is kept in first-class condition; it must be provided with the best of oil, and fresh put into it before each exhibition. After the exhibition all oil must be poured out.

"New wicks must be put in frequently; any signs of a crust forming on the top of the wicks is a sure indication that the oil or wicks, or both, are not good. The wicks should be trimmed before each trial—wiping the top of the wicks off may answer the purpose; it is advisable to take off the corners of each wick to prevent a slight jet of flame from striking the glasses of the flame chamber.

"All air passages should be kept free from any dirt; the clippings of the wicks and ends of matches are liable to fall upon the wire gauze that regulates the flow of air to the wicks.

"The oil tank should be kept free from oil that is liable to be spilled upon it when being filled, or that is jolted out when carried; oil on the outside of the lamp or flue will cause an unpleasant smell in the room.

"Care should be taken, with lamps having adjustable flues, that the flue be given its right length—this is generally furnished by the maker: if too short, the lamp will smoke; if too long, the flame will lose power."

ARTIFICIAL LIGHT FOR PHOTOGRAPHIC PURPOSES.*

THIS old form of King lamp may well be called the prototype of the Edison, Manson, Swan, Siemens, and the host of others that have been presented since. In all these the carbon is so thin that it may be called a wire. The light so obtained with a sufficiently strong current is about equal to a good Argand gas burner—about twenty candles. An electrical current passing through a carbon filament obeys Ohm's law, as through a metallic wire. But in metals the resistance increases as the temperature rises, in carbon it diminishes.

The advantages of the incandescent over the arc light for portraiture are so obvious that incandescent installations have been a desideratum much hoped for, and more than once tried. But there were corresponding disadvantages, as for instance, the yellowness of the light, which caused the experimenters to return to the arc or daylight; and it began to be looked upon as practically an impossibility. But Mr. Adamson, of Glasgow, after several years of experiment, not being satisfied that the arc light was as good as he thought it ought to be for photographic portraiture, perfected, and has placed upon the market, an incandescent lamp which bears his name, and which has overcome the difficulty of obtaining sufficient actinic light for all photographic purposes.

It consists mainly of a large umbrella shaped reflector lined with white silk, round the under edge of which is arranged a series of incandescent lamps. The exact number of lights depends upon the size of the studio which it is intended to illuminate, but as a rule it is forty-eight. An extremely ingenious switch arrangement allows the current to be turned into the lamps in pairs or fours, so that there is need to be any sudden flood of light upon the sitter, and any number of lights may be kept in operation for any length of time. Thus, if he wish it, the photographer may leave two or four lamps alight that will sufficiently illuminate the whole studio, to make it cheerful on the entrance of a sitter. The silk reflector allows a soft white light to pass through it, so that there is no dense shadow over a portion of the studio; and this must affect the softness of the lighting during the exposure. In speaking of a soft white light, we do not mean a pale yellow, for the great feature of this apparatus, and the one that makes it really practicable, is the whiteness and intense actinic power of the light, which is gained without any loss of softness. The light is much bluer, but Mr. Adamson contends that the rays included in the incandescent are in greater proportion than in the arc lamp and are distinctly valuable. This he illustrates very forcibly, and in a somewhat unexpected manner, by two prints made from the same negative and on the same sheet of (say gelatino-chloride) paper, one with the arc and the other with the incandescent lamp. The difference is very great, whether the arc lamp printing be quick or slow. The incandescent print seems more like a daylight one, and tones and fixes with much less loss than the other.

The whiteness of the incandescent lamp is dependent upon the high pressure at which it is worked, and which depends somewhat upon the special regulating apparatus, an important part of the Adamson system, and a part that is protected by patent.

It has been suggested that the high pressure used in the Adamson lamp must seriously affect the "life" of the individual small lamps; but actual experience shows that with care a set will last for at least a year of constant work, and the cost of renewing a whole set is but small. The cost of the current in England is very small. The absence of "feed," either hand or automatic, is an advantage, especially to those who are not practical electricians. In fact, the whole working of the light is simple, smooth, and noiseless, so that even the most nervous sitter or operator need not be startled. It would seem from this description that the problem of using the incandescent lamp, so long hoped for, has at last been solved.

During the past year or two many improvements have been made in the arc and incandescent lamps for portraiture. In England, Houghton & Sons introduced a portable one which has several new and good features, easily worked and complete in itself, requiring no fixing to wall or ceiling, well balanced on its stand, can be lowered or raised and turned in any direction. The light is masked by a basin-shaped reflector of enamelled iron, which throws the light into a large reflector 4 ft. in diameter, of basket-work, lined white inside. The feeding of the carbons is worked by hand. Its portability is one of its principal recommendations. Its price, being one-half of that of lamps heretofore offered, also recommends it. O. Sichel & Co. introduced an incandescent lamp which has many good features. Gwynne & Co., a new portable electric lamp in two sizes, mounted on a stand which allows universal movement, vertical or horizontal. The smaller lamp has a reflector 3 ft. 6 in. in diameter, power normally of 6000 candles, which can be increased if desired to 8000. It has an automatic feed which is reliable and simple. In this country the progress made in electric lighting is by no means behind that of our neighbours across the sea. In fact, in some particulars, it is very much in advance. To enumerate the number of the new lamps introduced here, and to properly describe them, would be beyond the space allowable in this paper. Both the arc and incandescent lamp have been adapted to the Magic or Optical Lantern with great success and consequent popularity, and are rapidly displacing the limelight. The employment of electrical lighting in all the various branches of industrial photography (and they are constantly increasing in number) has been phenomenal during the past few years, so much so that to find a plant without an electrical installation is now almost an impossibility. New discoveries are constantly being made of much value to those who employ the electric light in their various processes. Thus, some substances but little sensitive to the light of day are more or less affected by the electric light. For instance, the *Bitumen of Judea*, which sometimes requires several days' exposure, so little sensitive is it, and especially to diffused daylight, is said to be impressioned in from thirty to thirty-five minutes at the farthest by the electrical arc light. I cannot close this brief history of artificial illumination for photographic purposes without calling your attention to a remark made early in the paper, which was this—"This source of light remained unused because the idea had not been conceived of rendering it practicable by diffusing it." But twenty years after its first employment "the idea" was conceived, and since that time, one has but to read the history of the past, to find that by the employment of reflectors and reflecting surfaces of great variety, and in almost every imaginable position that the mind of man could conceive, the question of its practicability was solved. I am in favour of securing to any one by patent a just reward for original ideas and valuable inventions, but I am decidedly not in favour of granting one for cutting

* Concluded from page 55.

the thread of a screw from left to right instead of the reverse, or for placing screens and reflectors at an angle the one-sixteenth of an inch greater or smaller. History plainly shows that all these shiftings of screens and reflectors have been used and tried before. The Patent Office in this country once refused a patent to an applicant for protection against ants with the remark "that there was no law to protect chalk marks." These patents if granted are too often used to catch the small fry; the larger fish escape untouched. JOHN H. JANEWAY.

THE KINEMATOGRAPH.

THE problem solved by Edison's kinetoscope has been successfully attacked along a different line by MM. A. and L. Lumière. The film, which in the kinetoscope takes the impressions of moving objects, is passed before the eye with a continuous motion, and it is only illuminated for about a 7000th of a second at the instant at which each successive picture is fully in view. Hence, says *Nature*, the total illumination is exceedingly feeble. A very bright object is necessary; the eye has to be brought close to the moving film, and the number of impressions per second must be at least thirty in order to give continuity. MM. Lumière's "kinematograph," which is not subjected to these disadvantages, is described in the *Revue Générale des Sciences*. The principal features of this instrument are a mechanism whereby the film is at rest during illumination, and an arrangement for projecting the images upon a screen so as to be visible to a large meeting. Under these circumstances, fifteen images per second are all that is necessary. The film is at rest for two-thirds of the time of passage of each image. During the remaining third the film is grasped and pulled forward as far as the next image by a set of teeth attached to a frame whose motion is governed by a cam worked by a revolving handle. The same apparatus also serves as a camera for taking the photographs, and for printing transparencies from the negative film. For this purpose two films are passed over the rollers, the negative and the film to be printed on, and exposure is made for a very short time as each negative image is placed in the field. An exhibition was given on July 11 at the offices of the *Revue Générale des Sciences*, at which the evolutions of cuirassiers, a house on fire, a factory, street scenes, and a dinner party were shown on the screen, and were much admired.

ON A PHYSICAL THEORY OF THE PERCEPTION OF COLOURS.

[Chemical News.]

IN order to explain the perception of colours, Young, and subsequently Helmholtz, admitted that each fibre of the optic nerve which enters into a cone of the retina is composed of three fibrils, one of which is strongly excitable by the red and little by the green and the violet; the second strongly excitable by the green and little by the red and the violet; and, lastly, the third is strongly excited by the violet and little by the red and the green.

This hypothesis accounts for the existence of three elementary colours; it equally explains a certain number of other facts, such as some peculiarities observed in dyschromatopsies, the phenomena of saturated colours, &c. But it is unable to explain many other facts not less important. Why should light having a wave-length of μ 0·620 strongly excite one of these fibres and have scarcely any effect upon the two others?

Here is a new theory of luminous perceptions which seems to me to agree better with the progress of physical optics and of physiology.

A luminous ray, after having traversed the different strata of the retina, impinges normally upon the pigmentary layer of this membrane; there it is reflected, and interferes with the incident ray. Hence we must have there, in front of the pigmentary layer, and consequently in the actual thickness of the retina, a system of stationary waves distant by $\frac{\lambda}{2}$, as in the experiment of O. Wiener, or in those of Lippmann on the photography of colours. It is further probable that these stationary waves can exist only in a feeble thickness, on account of the absorption by the medium which constitutes the retina.

Let us remark, in passing, that this specular function of the pigmentary layer exists in an unquestionable manner in the ox, where it constitutes the "carpet." These stationary waves excite the nervous terminations of the optic nerve. These terminations are of two orders, the rods and the cones.

The rods being constituted by cylindric fibrils, respectively parallel, we can conceive that the stationary waves will excite them all, whatever may be their position—that is, whatever may be the λ of the incident light. Hence we conclude that the rods give to the brain the general notion of light without enabling us to judge of its colour. We know that the brain always conveys its excitement to the circumference, whatever may be the place where the nerve has been excited.

The cones, on the contrary, being formed of fibres, parallel, but unequal in length, will be excited differently, according to the λ; they will enable the brain to take account of the colour.

These two conclusions are fully verified by experiment.

It is known that we do not perceive all the colours well except by the central part of the retina (the yellow spot). Now, it is there where the cones are found, the rods being turned towards the equator of the retina, which gives merely the sensation of light without the notion of colour.

On the other hand, nocturnal animals which do not distinguish colours have no cones, whilst in birds which feed on coloured insects the retina is rich in cones.

Finally, if this theory is correct, whenever the pigmentary layer disappears, whether by old age or disease, there must result a parallel enfeebling of sight (a chromatopsy). This is apparently confirmed by experience.

This new theory can be brought to harmonise with the hypothesis of Young and Helmholtz. We need merely admit that the fibrils of the cones are divided into three groups proceeding to three different centres of perception. Still more, it explains why the wave-length which strongly excites one of these groups of fibrils must excite the other two groups feebly. It explains that curious arrangement of the retina when the excitable elements (cones and rods) are found placed in the deepest stratum, turned, so to speak, away from the side of the pigmentary layer, which has hitherto appeared inexplicable.

It is remarkable to note that the procedure employed by the eye in taking account of the wave-length of a ray of light is quite comparable with the procedures hitherto employed by physicists.

To me this theory appears satisfactory to reason, since it reduces the perception of colours to the appreciation of a wave-length which is a magnitude of an order comparable to the dimensions of the anatomical elements of the retina. It further seems to me to throw a clear light on the explanation of a number of the peculiarities of the eye.

To cite merely a single instance, in the study of the achromatism of the eye we must no longer consider the retina as a simple screen, like those of our laboratories, but a screen which perceives the different colours in different zones.—*Comptes Rendus*, cxxi. p. 133.

GEORGES DARZENS.

THE AMERICAN LANTERN TRADE.

OUR Philadelphia contemporary, *The Exhibitor*, remarks: "To say that the Lantern trade is brisk would be saying what all know not to be so, as it rarely is so in the midst of summer: but to say that indications point to a good fall trade is telling what all in the trade have reason to believe. The fact is that for several seasons past the lecture field has been in an unhealthy condition—it naturally was affected by the general depression in all other directions. The lantern and all of its accessories are not absolute necessities, and consequently when the times pinch it is forgotten for other and more needful wants. The want of support has driven many from the field, and it follows that with the improvement in business, that is so apparent, there will be a good opening in many directions for those who are first in the field.

"One striking peculiarity about the trade has been the fact that the slides section has suffered more than the lantern. It may partially be accounted for by the rental of slides, and in the other direction by reason of many lanterns being used for society work only, where never more than the one set of slides is bought.

"The falling off in the sale of movable and mechanical slides has been fully as great as in any other kind, to the great surprise of some in the trade who thought there was a wide field in this direction. The trend of the demand is in the direction of historical subjects, particularly those relating to the early American epoch, as was intimated in a previous number; this is the outcome of a wave of patriotism that is sweeping over the country. It is not in our province to discuss the cause of such a wave, but feel satisfied that it brings grist to the mill.

"There is a healthy demand for sets that carry with them some pathetic, humorous, or moral tale. There is a good opening in this direction for such as will appeal to American life and character. The most of those now in the market are of English origin, and do not fill the want here.

"First-grade coloured slides have held their own, contrary to many expectations. In answer to a persistent demand a second-grade coloured slide has been put upon the market; but the sale of them has been surprisingly small, showing that a small crowd can make a great clamour.

"The lantern is being built in all manner of fantastic shapes, simple and complicated, and dubbed with the most surprising names; no improvement of great note is apparent except in the one of electric lanterns, in this direction the field is wide open and presents an inviting but expensive one for inventors.

"Gauged by relative population we think the demand from the South is greater than from any other direction; this may be because that section was not affected so much by the depression, or is recovering sooner. Colleges, schools, institutions of all kinds, associations and clubs are awakening to the importance of the lantern as an educational, interesting and amusing agent, having an endless scope."

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*October* 4, 1895.

THE LANTERN RECORD.

CONTENTS.

	Page
THE SEARCH LIGHT. By RADIANT	73
LANTERN MEMS. By G. R. BAKER	74
ELECTRIC LIGHT FOR LANTERN WORK. By CECIL M. HEPWORTH	75
LANTERN NIGHTS AT THE ROYAL PHOTOGRAPHIC SOCIETY	76
THE ELECTRIC LIGHT IN THE OPTICAL LANTERN. By C. HIGGS	76
THE CAMERA IN THE ROCKIES. By H. H. BUCKWALTER	77
CURIOUS OPTICAL PHENOMENON. By R. A. F.	77
PHOTOGRAPHING INTERIORS BY FLASHLIGHT. By DR. HUGO ERICHSEN	78
LANTERN SLIDES BY REDUCTION, EXPERIMENTALLY DEMONSTRATED. By J. H. BALDOCK, F.C.S.	78
THE "PRIMUS" LANTERN SPECIALITIES	79
TO PREPARE "WET" LANTERN SLIDES FOR COLOURING	80
COLOUR PROJECTION	80
THE POLYORAMA	80

THE SEARCH LIGHT.

I understand that at the Photographic Club at an early date there is to be a limelight jet competition, with a view to determine the particular form and make of jet that has the best illuminating power. A competition of this kind, scientifically arranged, should be instructive and useful.

* * * * *

The well-known regulator of Mr. R. R. Beard appears to have recently entered upon a new stage of existence—that is, it has been partly imitated and reinvented. Mr. Beard has promptly taken measures to assert his rights in his own invention.

* * * * *

Some of the most beautiful lantern slides I have ever seen were placed in the lantern-slide competition of the Leeds Exhibition. The Leeds Photographic Society men, if I remember aright, are noted for their skill in slide-making, as witness the excellent set lent by them to the Affiliation of Photographic Societies.

* * * * *

There are eight sets of lantern slides in competition at the Royal Photographic Society's Exhibition, and four sets of stereoscopic transparencies. I am sorry I was not a Judge, otherwise I should have used my best endeavours to have had a medal awarded for stereoscopic work, which needs and deserves encouragement.

* * * * *

By the way, for stereoscopic transparency work by contact, Mr. W. I. Chadwick, of Manchester, is bringing out a new frame, which has one or two good points about it. It has an opening five and three-quarter inches by three inches, which is the size the finished double transparency is to be. The negative, which may be either six and a half inches by four and a quarter inches, or six and a half inches by four and three-quarter inches, is placed over this opening, and centered to a mark, being slid in as it were, between two frames, and, when it has been adjusted with reference to the particular parts of the negative it is desired to include in the transparency, it is clamped down in position by means of screws and bolts (springs are in future to be fitted to the frame) and the exposures made.

Those who know anything about stereoscopic transparency making will at once see the points of superiority this frame has over the old one. In the first place, the negative is a fixture, and therefore does not require to be moved; in the next, no guide pieces are required. It is assumed that the centres of the lenses on the camera have been fixed at three inches: in that case, the length of the opening being governed by the centres of the lenses on the camera, and the total length of the frame governing the centres of the finished transparency, and of course the length of the transparency plate, the centres of the resulting transparency will not exceed three inches, and the width of each half will not be more than two and three-quarter inches.

* * * * *

I have tried this frame and find it answer well, and I recommend it to stereoscopists, who will find it especially useful where it is desired to make a number of exposures off the reel from one negative.

* * * * *

America is the home of Conventions, photographic and otherwise. One of the former kind has just been held at Detroit, and in some of the photographic papers on the other side its subsequent literature has been of a refreshing and frank kind to which we in this country are unaccustomed. Here are a a few "Convention Notes," taken from the *Photo Beacon*:—

"Rösch can congratulate himself upon escaping so easily. Would he have settled down in Detroit had he lost the balance of his clothes?

"The boys are all anxious to know when and where the presentation ceremony to Willie Wood will occur. It should be made a public affair at any rate.

"All world's records were broken by George Ayres in his great sprinting act at the Rushmere Club. His slide down the inclined gang plank was a masterpiece.

"Marshall behaved himself much better at Detroit than at Columbus, where there was a popular uprising to 'tell Marshall's wife.' Now, *will* you be good?

"Can anybody tell us just how many Bellsmith cocktails it would be safe to take at one sitting? Alas, what would be their effect in combination with Climax developer?

"Willie Whiskers, who escorted certain young ladies to the tobacco factory, is anxious to find out the name of the other party for whom those young ladies made him give up his own lot of the weed.

"Julius Strauss would make a first-class collector for a foreign missionary society. He can gather in more money to provide clothes in one hour than any score of other men could possibly do in a week.

"Billy Glines and Pirie MacDonald had a heated argument regarding plates at Detroit. It was only solved when one of the pair unintentionally removed his glasses and so gave undue advantage to the other."

The goings on at Detroit must have been almost as lively as those of Shrewsbury.

Radiant.

LANTERN MEMS.

Wild Animals and Scientific Instruments! This is, indeed, a curious mixture, but in a progressive age—a mile-a-minute age, in fact—one must not be surprised at anything, especially where railway companies are concerned; and so, after the first shock has gone off, we have looked closer into the matter, and find that the declaration form issued by one of the "great" companies, and probably adhered to by others, is a new form of protection to themselves, and a means of shifting the risk in carriage of damageable articles on to the owner.

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The comical part comes in with the heading, which runs as follows:—"The —— Railway Company hereby give notice that, as regards wild animals, statuary, musical instruments unpacked, furniture unpacked, Welsbach lamps, saccharometers, lactometers, barometers, thermometers, and other delicate scientific instruments, they will only accept the same for carriage by passenger train on the condition that the owner agrees to relieve the Company and all other Companies or persons over whose lines the same must pass, or in whose possession the same may be during any portion of the transit, from all liability for loss or injury to the same, except upon proof that such loss or injury arose from wilful misconduct on the part of the Company's servants."

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Then follows the agreement to relieve the company or companies from all liability, which has to be signed by the sender or his representative; and if no special mark, such as, "Glass," "Fragile,' "With great care," "This side up," &c., should be on the package, it is carried at ordinary rates, whereas hitherto an extra charge of fifty per cent. on the carriage ensured special care, and, in case of breakage, the value up to the amount of carriers' liability (£10), or more if specially declared and an extra fee paid.

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Now, if I am correctly informed, by the representative of one Company, by paying the ordinary rates of carriage of merchandise, and making a special insurance—1*s.* for 10*l.*—the precaution can be taken to guard against loss. This will be less in nearly all cases than the old "glass" charges, but why the office humourist should be turned on to compile this consignment note, and couple wild animals, which, I suppose, are seldom carried, with delicate and scientific instruments, which are frequently carried, I cannot think. Optical lanterns or apparatus do not seem to be specially mentioned; but, no doubt, if any caution appeared on the box or package, the booking clerk would soon class them with "delicate scientific instruments." The representative of another railway company says, "No insurance can be effected on goods carried at owner's risk," so again we are in doubt, and must write to headquarters for their reading of the note.

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The connexion between wildness and madness is much closer than between wild animals and scientific instruments, and I remember, when I first took up lantern work, I was told by a very well-known lanternist at that time, and a jolly good, if somewhat eccentric, fellow, that, if you were not mad when you took to lanterns, you would very soon become so. I am thankful to say, although I have had thirty years of it, *I* am not mad yet. At times, however, I have nearly been driven cranky when, by such things as a deluge of correspondence through arranging to give all necessary instructions in working a triple lantern, making gas, &c., without seeing the operator, and at other times when carrying out newfangled ideas, such as pedal-feeding automatic lanterns, and "departures" of that order.

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If it were not for eccentrics, or, perhaps I ought to say, enthusiasts, there would, no doubt, be very little progress, and so manufacturers, although at times sorely tried, have much to be thankful for, and, if, as stated, the border line between genius and madness is a very thin one, we can sincerely hope it will not be the optical lantern enthusiasts that will break through the same, and go crazy on illumination, definition, registration, or what not.

Rather a feature has recently been made of a gas-cylinder explosion in a theatre during a fire, and a statement made as to the destruction caused to the building through the bursting of same; but I am informed on very good authority that the cylinder in question did not burst in the accepted sense of the term and fly about, but simply opened out under the heat and allowed the oxygen to escape. In every theatre that has been burnt down during the past nine years gas cylinders have been on the premises and subjected to great heat.

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At Southend Theatre one cylinder was sufficiently heated for the sweating round the neck to give way and permit of the gas escaping, while at the Theatre Royal, Glasgow, more than a dozen cylinders were in the theatre and must have been red hot, but only one bulged and opened, all the metal remaining intact, while another opened at the neck and the rapid combustion developed by the escape of the oxygen burnt the metal. The very fact of the heat softening the metal when in a fierce fire is a safeguard against bursting into fragments, for at about 800° Fahr. steel or iron shows colour, if not quite red hot, and so would be softened and tear open rather than burst.

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In the theatre recently alluded to the iron girders were all warped and distorted with the great heat, but no damage could be traced to the cylinder bursting. In most of the places of entertainment the cylinders are kept outside the buildings or in cellars, well away from the audience, or at least those theatres, &c., licensed by the London County Council, and, though considered a nuisance by lanternists and theatrical managers in some cases, it is probably a wise precaution to obviate any possible chance of panic.

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As an example of what can be done in the way of lighting, when required, the Empress Theatre, at Earl's Court, can be quoted, for there no less than forty-eight limelights are supplied from gas-cylinders far removed from the auditorium, the gas being conveyed by piping to the respective theatre limelights. To supply this number sixty 100-feet cylinders are employed, and each one is fitted with a Beard's automatic regulator and a pressure gauge, keeping the pressure uniform and permitting the operator to have his gas on supply at the right pressure for his use by simply turning on his taps. As much as 7000 feet of gas are used per week, and the limelight men have nothing whatever to do with the cylinders, which are replaced as exhausted, the hydrogen gas going in one entrance of the building and placed in a special vault or compartment, and the oxygen by another entrance to another place, so that they are never in contact.

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The laying of the pipes was done in a very short time, and it speaks much for the direction of Mr. Imre Kiralfy that the stage lighting is so perfect, and the judgment and energy displayed by Mr. Murray and his staff of men at Brin's that the whole was brought to a successful issue in good time for the opening. Those who have not yet seen "India" should lose no time in doing so, for it is a grand and marvellous spectacle, and, besides showing the talent displayed in combinations and groupings, is a splendid example of harmony, colour, and rapid changes of light in all its varying hues. The theatre is one of the largest, if not the largest, in the world, and the arrangements in many ways are unique, notably the disposition of the limelights.

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If imitation is sincerest form of flattery, it must be gratifying to the pioneer of the small-size electric arc lamps for use with optical lanterns to see so many treading in his footsteps, and introducing electric regulators or lamps for the same purpose; nevertheless, no one will grudge Mr. G. Davenport the honour of obtaining a first silver medal for his adaptation of the arc lamp to the lantern, from the Royal Polytechnic Society, who have recently held their annual

Exhibition at Falmouth. With the electric current available at so many societies' premises or meeting rooms, the electric light is being more and more adopted, and it is only right that praise should be given those who simplify and bring apparatus of a practical nature within the reach of all or nearly all those who use the optical lantern. The Royal Photographic Society have recently had one of these lamps fitted to their lantern.

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THE next thing to invent is a practical portable generator for acetelyne gas, and a burner that will give a *small* area of light of at least 200 candles' power. Should this not be possible, there will be a use for those travelling abroad and in out-of-the way places for a really convenient gas-holder, that will hold ten cubic feet of oxygen that one can make before the entertainment, as one did of old, from chlorate of potash. It, however, goes without saying that no one will bother to make gas if they can get it compressed, as we do now, for such a small sum per cubic foot, and, if the railway companies continue to impose foolish restrictions, all the societies should combine, or each use their influence, to bring pressure to bear on them for the removal of same, and a return to a reasonable and business-like order of things in the conveyance of cylinders of gas.

G. R. BAKER.

ELECTRIC LIGHT FOR LANTERN WORK.

II.—THE ELECTRIC CURRENT.

IT is essential that a lanternist who aspires to electrical work should know something about the properties of the electric current. It need not be much, for the finer measurements and testing such as appertain to the dynamo room will never come within his province; but he ought to have an idea of what is meant by such terms as "volt," "ampère," "ohm." A knowledge of these matters, though they are not at first easily comprehended, on account of their insimilitude to any units of measurement with which we are familiar, is, nevertheless, to be gained without much difficulty by a careful perusal of different text-books on the subject.

Perhaps the simplest way to define these terms is to say that the volt is the unit of pressure, of that force which tends to drive electricity round a circuit, and through any resistances which may be placed in its path. The ampère is the unit of quantity of electricity which passes round a circuit and through resistances, and is proportional to the voltage—the pressure which drives it, and inversely proportional to the resistance. The ohm is the unit of resistance.

But electricity is not a tangible substance like water or gas. We cannot weigh it, or measure it with quart pots or yard measures, like anything with which we have been previously familiar, and to say that the volt is the unit of pressure is to convey but the very vaguest impression to minds whose ideas of mechanical power are confined under such heads as steam, air, or water under pressure, bent springs, lifted weights, and the like. The simplest way, then, to arrive at the necessary understanding of these terms, and of these conditions of electrical power, is to reduce the matter into the sphere of one of the sources of energy with which we are familiar. No true analogy can be found, but there are resemblances between electrical and, say, compressed air power, which will serve to point the moral.

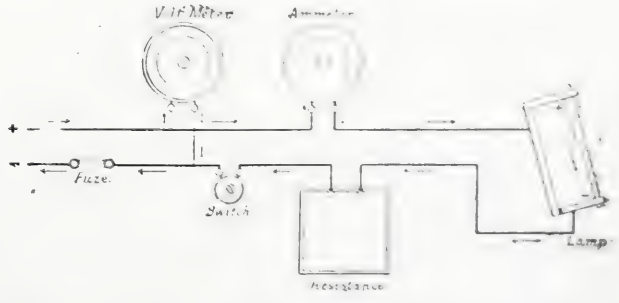
There is, for all practical purposes, air everywhere, but we cannot make it work for us unless we put part of it under pressure. There is electricity everywhere, but it will do no work unless we can bring pressure to bear. Discontent is the prime cause of all human work, and so it is in other things. If we can confine more or less electricity or air in a given place, it will be willing to do work in order to restore equilibrium. In the case of air we call this discontent pressure, and we measure it as so many pounds on the square inch. In electricity we call it pressure, potential or electro-motive force, and we measure it as so many volts.

In both cases the power to do work depends not only upon the pressure, but also upon the *quantity* of air or electricity which we have under pressure. Two cubic feet of air under a certain pressure will do twice the work that one will. Electricity cannot be measured in cubic feet. It is not convenient to measure its capacity, because we cannot store it up in any kind of holder. It must be pumped out, as it were, just as it is wanted. So it is customary to measure the stream or current. To go back to our analogous case, we may say that a stream of air one inch in thickness at a pressure of 100 pounds on the square inch will do a certain amount of work. If either or both factors be increased, the work will be augmented in direct proportion. The stream or current of electricity is measured in ampères.

There is only one more term which we need trouble about, and that is the ohm, the standard of resistance. In the case of our compressed air simile, it is necessary, before we can expect the air to do any work, that we convey it by suitable means from the pumps to the place where the work is to be done. This is accomplished by means of tubes. Now, these tubes offer a certain amount of resistance to the flow of the air, depending, of course, upon their length and thickness, and also upon their internal smoothness, and it stands to reason that the amount of the current of air will be inversely proportional to the resistances which impede its flow. It is the same with electricity. All the various resistances have to be taken into account, and balanced against the pressure, before the amount of current, and consequently the power for work, can be estimated.

These three units of measurement—volt, ampère, and ohm—bear a definite relation to one another, perhaps the most important part of the whole scheme. For instance, one volt represents an amount of power which is just sufficient to drive one ampère of current through a resistance of one ohm. 100 volts will send 100 ampères through one ohm, or one ampère through 100 ohms, so, as will be seen, it is easy to formulate a law which shall be universally applicable. The current, in ampères, is equal to the electro-motive force or pressure, in volts, divided by the resistance in ohms. In the same way, the current in ampères being known, it is easy, by multiplying with the resistance in ohms, to find the voltage, or to find the resistance by dividing the voltage by the ampères. The easiest way to remember this law is by means of an easy symbol, which I believe, hails from America. Here it is: $\frac{E}{CR}$. E signifies electro-motive force or voltage C stands for current and R for resistance. Place your finger over the factor representing the unknown quantity, and treat the remaining two as a simple fraction.

Practically, in every case with which the lanternist has to do, the E. M. F. will be known. Anyhow, he can find it out for himself in a moment by means of a volt meter. It will then be for him to decide what resistance he will need in order to get the required current. And here we must note one peculiarity about electricity. The current is supplied at a certain specified voltage, but it depends upon the consumer how many ampères of that current he takes, and he has to be very careful about it too. Suppose, for instance, he has wires laid down in his house capable of carrying a current of ten ampères, and one day he absent-mindedly connects up a lamp which will take twenty-five. Well, the current apparently is only too glad of an opportunity of doing extra work, like a good servant wishing to bring money into its master's coffers. The ten-ampère wires are instantly burnt up, and there's an end of them. Or, if the wires had been bigger, and the demand for current greater still, the supply company's leads under the road would have been burnt up,



or, if they had withstood the strain, their engines themselves would have utterly succumbed. But this is all supposing that the supply companies take no precautions against such a fatality. In reality, if they undertake to supply a man with a certain number of ampères, they place in circuit a fuze, as it is called, of tin wire, which would immediately melt if too much current be taken, thus preventing further damage. Moreover, they lock it up safely, so that the consumer cannot get at it. If he be a wise man, he will himself insert a slightly smaller fuze, so that, should any accident occur, his fuze will blow off first, and then he will be will be able to replace it without calling in one of the company's servants.

The moral of all this is, that a lanternist, before he attempts to set up his lantern or anything else, should ask to see the safety fuze in the circuit from which he is going to draw his current. He can then assure himself that it is sufficiently large, and a little to spare, to carry the current which he will be likely to require, and if he

have in his pocket, as he most assuredly should, a small length of fuze wire of the proper size, he will be able to quickly replace the old fuze, should he be unfortunate enough to blow it off.

Suppose, now, the hall in which a lantern show is to be given is supplied with electricity at a pressure of 100 volts—the almost universally adopted E.M.F. in England, at all events. The lanternist must then decide what current he will need in order to give him the required amount of light. This should, of course, depend upon the size of the hall. Let us say it is a comparatively small building, and a light equal to that given by the very best limelight will content all parties. Then he will decide upon ten ampères. He must then satisfy himself that the leads are big enough to carry the current. No. 14 copper wire will do, and that suggests that our lanternist should have about him a standard wire gauge, in order that he may be certain on this and other points. Of course, if the lamp to be used be an automatic one, this question of current will be settled for him. He must use that current which the lamp demands, and he must not depart from it a quarter ampère, whether he have to cover a forty-foot screen at the Crystal Palace or one of four feet in a small room. However, to go back to our supposititious case, ten ampères is the current required in a circuit of 100 volts. Ten into 100 goes ten times, therefore ten ohms is the total resistance required.

Resistance coils may be made either of iron wire, German silver, or platinoid. Tables of the resistance per yard and per pound of different thicknesses of these wires may be obtained, and from these data any amount of resistance can be easily built up. Iron wire is, of course, the cheapest of these three, but it is a better conductor of electricity than the others, so a much larger quantity is required. It must be borne in mind, in building a rheostat, that the voltage which is absorbed by the resistance is turned into heat, for electricity, like other forms of energy, can never be destroyed. Therefore it is necessary to choose a wire of sufficient thickness to carry the current without getting too hot. For my own part, I generally use platinoid wire of No. 14 gauge. This will carry a current of fifteen ampères without danger. In my rheostat, which I have designed specially for optical lantern work, there are four and a half pounds of this wire, representing a resistance of nearly $7\frac{1}{2}$ ohms. This I find to be amply sufficient, even on a circuit of 120 volts, and, as it is variable throughout its entire compass, it serves equally well on currents of lower tension. The resistance consists of nine coils of this platinoid wire, each coil being equal to about $\frac{3}{4}$ of an ohm. By means of a simple sliding switch arrangement, one, two, or any number of the coils may be instantly thrown in or out of action, while a similar sliding connexion, acting throughout the length of one coil only, enables any fractional portion of that coil to be placed in circuit, as well as any number of complete coils. By this arrangement the current can be controlled with the greatest nicety, and a difference of as much as ten ampères, or as little as the one-hundredth part of an ampère, can be made instantaneously and with equal ease.

There is no direct means of measuring resistance. It can only be done by comparison with a standard, but with this the lanternist has nothing to do. If he wish to know the resistance of any part of his circuit, he can always arrive at it by deduction, as already explained.

With regard to voltage and current, however, each can be directly measured by means of the volt meter and the ampère meter, or amimeter, as it is more usually called. These instruments are very similar in appearance, and indeed in construction, differing only in the manner in which the electro-magnets are wound. Each consists, in its simplest form, of an electro-magnet, which, when electricity is passing, tends to draw an armature, to which is connected an indicating needle, out of its normal position. The amount of deviation is proportional to the current, or to the E.M.F., as the case may be. The indicating needle traverses a dial, which is graduated and divided into volts in the one case, ampères in the other. The magnet of the amimeter is wound with a few turns of very coarse wire, through which the current to be measured has to pass. It is therefore connected *in series* with the lamp and other resistances.

The volt meter, on the contrary, is only required to measure *pressure*, and the current does not pass through it. The magnet is, therefore, wound with a large quantity of very fine wire, which offers so much resistance to the current that practically none passes through. The instrument must, of course, be connected *in parallel*, that is to say, it must be connected *across* the two wires whose difference of potential is to be measured, and not *in* the circuit. The amimeter measures the amount of current passing through the whole circuit. The volt meter shows the pressure between any two points of a circuit across which it is connected.

CECIL M. HEPWORTH.

LANTERN NIGHTS AT THE ROYAL PHOTOGRAPHIC SOCIETY.

DURING the course of the Exhibition there will be displays by means of the optical lantern, at the Gallery, 5A, Pall Pall East, every Monday, Wednesday, and Saturday evening, as below:—

Saturday, October 5, slides sent in by Mr. J. W. Wade, *Mona's Isle* viâ *Lakeland*.

Monday, October 7, slides sent in by Mr. F. P. Cembrano, jun.

Wednesday, October 9, slides sent in by Mr. E. Dockree, *Gleanings here and there*, and by Messrs. R. W. Thomas & Co.

Saturday, October 12, slides sent in by Mr. A. L. Henderson.

Monday, October 14, slides sent in by Mr. T. M. Brownrigg *Abroad and at Home*.

Wednesday, October 16, slides sent in by Mr. Henry Sandland, J.P.

Saturday, October 19, slides sent in by Mr. Henry Little.

Monday, October 21, slides sent in by Mr. J. A. Hodges, *Through Lakeland with a Camera*.

Wednesday, October 23, slides sent in by Mr. Edgar G. Lee.

Saturday, October 26, slides sent in by Mr. T. M. Brownrigg.

Monday, October 28, slides sent in by Mr. W. D. Welford, *Hand Camera Work*.

Wednesday, October 30, slides sent in by Members of the Woodford Photographic Society.

Saturday, November 2, slides sent in by Mr. G. E. Thompson.

Monday, November 4, slides sent in by Mr. J. Carpenter and by Mr. G. Hankins.

Wednesday, November 6, slides sent in by Captain W. de W. Abney, *Alpine Scenery*, and Mr. J. T. Field, *Studies in Cloudland* and *Flower Studies*.

Saturday, November 9, slides sent in by Mr. J. Dore.

Monday, November 11, slides sent in by Members of the Amateur Photographers' Field Club.

Wednesday, November 13, slides sent in by Mr. Paul Lange, *Norway Revisited*.

Mr. R. R. Beard will, as usual, have charge of the lantern.

THE ELECTRIC LIGHT IN THE OPTICAL LANTERN.

PERHAPS one of the first questions occurring to those interested in the electric light for lantern work will be: Is there any means of storing the electric current in a manner to correspond with the gas bags and cylinders at present employed? Keeping in mind the special requirements of such a system, and particularly that of portability, the answer afforded by catalogues of electrical apparatus is apparently a negative one. The question may, however, seem more completely dealt with in a short *résumé* of the difficulties attending the use of batteries in generating and storing electricity than by perusal of the technical information obtained from the source mentioned.

Without going into minute details, batteries may be divided into two classes: those generating electricity and technically known as "primary" batteries; and "accumulators," "storage," or "secondary" batteries. Of the former, no doubt, the best known to amateur electricians are the bichromate, Bunsen's and Grove's, which may be taken as good examples. The accumulator consists, in its simplest form, of two plates of lead immersed in dilute acid. In the operation of charging the two plates are connected to the terminals of a primary battery, dynamo, or other source of electricity, the chemical action set up by the current altering the electrical relation of the lead plates to each other. In discharging, the accumulator itself becomes the source of current, the plates gradually returning to their normal condition. The capacity of an accumulator, therefore, depends upon the size of the respective plates, and various methods have from time to time been adopted to obtain the greatest possible working surface with the least bulk.

It may be well to state here that electricity will hardly be found an economic illuminant if primary batteries are employed; as a matter of fact, their application, so far as electric lighting is concerned, has been confined to experimental purposes; for, while it is quite possible with a number of cells of, say, the bichromate battery in a modified form, to maintain an arc light of sufficient intensity for lantern projection, the constant care such an arrangement needs (omitting the cost of charging and renewals) will minimise any advantages occurring from the peculiar properties of the light.

It is, therefore, to the accumulator or secondary battery that attention must be turned if anything more than experimental operations are intended. But here, again, difficulties arise in the weight and bulk of a set of cells of sufficient capacity. If an arc lamp be adopted, the current required will probably be about five to six ampères to be maintained for, say, three hours, at a pressure of fifty volts. For this voltage it is usual to allow twenty-six cells, each giving when fully charged about two volts. Quoting from a catalogue before the writer, a set of accumulators of this capacity would weigh between two and three hundredweight, and occupy some five or six square feet of floor space.

The carriage of an arrangement of this description would with the majority be an insurmountable barrier to the employment of accumulators, which is therefore restricted to those cases where for some reason the electric supply is unsuitable to the demands of arc lighting, and which are of course beyond the scope of the present notes.

The principal objections to the apparatus for storing electricity described may be stated, therefore, as being the excessive weight and bulk, the difficulties attending charging, and probably the necessity for a more complete electrical knowledge than that possessed by most lanternists. Although in these progressive times improvements are constantly being made in every electric appliance, it is too much to expect that the accumulator will be so perfected in regard to portability as to compete in that respect with the gas cylinder. And on this account alone the electric light will only be found a cheap and convenient illluminant where a constant supply of current is available. C. Higgs.

THE CAMERA IN THE ROCKIES.

[The Photo-American.]

Colorado and the Rocky Mountain region is visited annually by thousands of amateur photographers, the great majority of whom get very ordinary results, mainly on account of over-exposure. As the number of "tourists" during this summer will probably be larger than ever before, a few suggestions may not be out of place. In the first place, don't leave your camera at home, for the very scenery which attracts the eye the most is not to be found in the regular stocks of photographs, for the reason that only the places which have been well advertised are greatest in demand.

Regarding the greatest cause of failures, it should be remembered that a clear day in the Rocky Mountain region is considerably clearer than in or near the large cities of the east, where the atmosphere is not only laden with smoke, but fog and haze cut off the light and give it a yellow tint. Besides, at an altitude of a mile or more above the sea level, the air is considerably less dense. Therefore, when in the mountains, it is well to either increase the speed of the shutter or use a smaller stop in the lens, holding down the light which reaches the plate. For ordinary landscapes the latter method is probably to be preferred, on account of the increase in the definition.

On account of the rarity and clearness of the air, distance in landscapes must be taken in consideration. A landscape with a background of mountains one or two hundred miles away is by no means unusual. If possible, orthochromatic plates should be used. In these a substantial advantage will be noticed. On account of the actinic light a slower plate than usual may be employed, and a greater amount of colour sensitiveness obtained. There seems to be no question as to the increase in colour sensitiveness in the medium speeds of plates. In addition to the distance, there is another feature which renders the use of these plates desirable. In nearly all the cañons and gorges, the rocky walls are highly coloured, in fact the whole general features of the mountain regions is highly coloured. In Platte cañon, for instance, there are several points where the bottom of the cañon is occupied by the foaming, rushing waters, fringed with grass. The wall rocks are coloured from a light yellow or sometimes slate at the bottom to a dark red at the top, broken, jagged, and a thousand feet or more above. In the most inaccessible places on these cliffs, trees seem to be growing out of the very face of the rock, though in reality in crevices where a few clods of dirt have lodged. Above all this mass of colour and form is the bluest of skies. In the afternoon magnificent cloud effects are generally obtainable. With all these in the picture as seen by the eye, the best orthochromatic give little idea of the natural.

Very few visitors to the west miss trips through the mountains, and it is surprising how much can be seen in an exceedingly limited time, and likewise with very little outlay financially. It is possible to make several trips of a day each into the mountains, and on each to get into a different class of scenery, though any will give a generally comprehensive idea of the Rocky Mountains.

Just west of Denver there are two cañons, either of which may be gone through in a day. Clear Creek cañon is sixty miles long, and every mile gives a change in the general scenery. For the first twenty miles the name does not seem to be very appropriate, for the creek is muddy with the waste of dozens of gold and silver concentrating mills along its course. At the western end of the cañon is situated a remarkable piece of railroad engineering known as "The Loop," only one of similar nature existing elsewhere in the world. The distance between the two last stations of the road, Georgetown and Silver Plume, is about a mile and a quarter in a direct line, but the road winds round the sides of the narrow gulch, passing over itself at an elevation of over 100 feet at one point, and making the railroad distance between the two towns about five miles. At the same time a raise of 1000 feet is made. The cañon being so narrow, the builders were compelled to adopt this surprising method in order to avoid impossible grades.

The town of Silver Plume furnishes a number of interesting subjects. It is a silver mining community, and is quite a novelty to many. The immense buildings at the mines and the wire-rope tramway, bringing ore from thousands of feet above, are generally interesting. Occasionally a burro train is seen on the winding trails running up the mountain side. These little animals, about twice the size of large dogs, are loaded with boxes and sacks of ore which make a pile as tall as themselves. An ancient, grey whiskered animal generally leads the procession, which marches in single file. Sometimes they are loaded with boxes, having painted on the outside the single word "Dynamite," indicating that, should one of the little beasts fall over "the grade," it would be useless to look for remains.

A branch of Clear Creek cañon leads to the double towns of Black Hawk and Central City, gold-mining communities and containing in their vicinity some very large and deep gold mines. Access to these is very easy, permission being readily granted by the persons in charge. A few flash cartridges will enable a trial at underground photography, though too much in the line results should not be expected without having some experience in regular flashlight work, as it is somewhat difficult work.

Platte cañon is also a few miles west of the city. The cañon is the source of the river made famous by frontier stories, the South Platte. Through this cañon, also, Leadville is reached, requiring at least three days to visit and get pictures. A very pleasant day's trip can be made, however, by running up through the cañon to where a magnificent view can be obtained of South Park. It may be explained that these parks in the Rockies, are immense level areas, lying between the mountain ranges, and in summer they are veritable garden spots and truly named parks.

On the trip to Leadville, two "passes" are crossed, though several small mountains are gone over which appear to be quite elevated. Just before reaching the town of Breckenridge, Argentine Pass is crossed at an elevation of 10,000 feet. Then the train winds down the mountain side and through a number of frontier mining camps, until the trip is begun over Fremont Pass. At an altitude of 11,300 feet, Climax is reached—the crest of the continent. Water from a little spring flows both to the Atlantic and the Pacific. From Climax the road winds around the sides of the mountains thousands of feet above a perfect gem of a valley, until it suddenly turns and enters Leadville through a side gulch.

Dozens of other trips can be made, but most of them are familiar to readers of guide books. Among them may be mentioned, Manitou and the Garden of the Gods, with hundreds of other points of interest in the immediate vicinity of these. A very pleasant way to visit these points from Denver is to take a morning train to Colorado Springs, and then electric cars to Manitou, returning to Colorado Springs through the Garden of the Gods by carriage or on foot.

In conclusion, the writer strongly urges upon all who visit the Rockies to bring a camera of some sort. The additional trouble will more than be well paid by the magnificent additions to private photograph collections which may be obtained. H. H. Buckwalter.

CURIOUS OPTICAL PHENOMENON.

The following description of an optical phenomenon, and its probable explanation, may be of interest. It will be observed that a similar experience occurring to one not accustomed to making optical experiments would very probably have caused him to believe that he had seen a ghost. It is therefore of importance psychologically.

The facts observed were as follows:—At about one a.m., August 26, I went to my bedroom; to get to it I had to pass through a small room which I used as a study. On entering it, though it was dark and I had no lamp, the small room semed brightly illuminated, about as bright as an eight-candle-power lamp would make it, apparently. To one side of a window in the room I saw a man standing, whom I recognised to be myself. The whole impression was very vivid and clear.

So far nothing was observed beyond what is described in the ordinary ghost story. I was much occupied with the consideration of a problem at which I had been working, and did not at first grasp the full signification of what I saw. On turning my head, the figure disappeared, but on looking towards the window, through which a very faint line came, the image reappeared. I then noticed that it was apparently standing in a position occupied, as I knew, by a large table. On more close examination, without, however, moving from the spot where I was standing, I saw that it had changed, and that it did not appear to have features; then it appeared to be flat against the wall, and I finally recognised it as an after-image of a shadow. On my first seeing it, however, it did not have this appearance to me, and I had evidently mentally supplied the

features, as one often does to the face of a friend who is seen at a distance which is really too great to admit of actual recognition.

I then got the impression of having seen the shadow before, and, on considering the matter a few seconds, remembered that it was just before I had started for my room. I had been working in another room, endeavouring to solve a physical problem for four or five hours, and for about half an hour, or possibly more, had been steadily looking at a lamp (a habit of mine when abstracted); I then got up, leaving the lamp lit, and went out on my way to my bedroom, as mentioned above. On going out of the door, my shadow was thrown by the lamp on the wall just to the right of the door. The passages were entirely dark, and it was not until I entered the room used as a study that the faint light coming through the window and falling on the same spot of the retina that was previously occupied by the image of the dark doorway stimulated the after-image.

I may say that my health was of the best, but that I had been smoking heavily for a few days previously, and the fact had begun to force itself upon me.

I would especially remark upon the apparent brightness of the apparition. I had never seen an after-image so bright. On going back to the room where the lamp was, I proved that the appearance of the shadow thrown as I went out of the room corresponded with that of the image seen, minus, of course, the features and colour, which had been supplied by the imagination.

In speaking of optical phenomena, I would say that an easy way of showing that the colours seen in the colour top are due to lack of accommodation, is by taking a piece of red paper or cloth, and turning the top till the inner or outer line matches it exactly. Then, without moving or changing the speed of the top, place before the eye a convex glass. The colour on the top will disappear, but that of the cloth, will of course, remain. Similar experiments to those observed with the top can be observed by drawing dark lines on a piece of glass, and waving dark and white paper behind them. R. A. F., in *Nature*.

PHOTOGRAPHING INTERIORS BY FLASHLIGHT.

[American Amateur Photographer.]

Now that fall is come and winter nigh, amateurs should turn their attention to one of the most fascinating branches of photography, the photographing of interiors. In the short days and long evenings that are before us, indoor photography takes precedence over outdoor photography. During this time, when our out-of-door operations are limited to snow scenes and frost-bound landscapes, many souvenirs of our homes may be secured that will prove invaluable when some accident of life removes us from them. Now is the time to perpetuate the memory of our familiar little nooks and corners by means of the art-science. What would you not give to have some photographs of your childhood home or the apartments of the dear old house that burned down and can never more be restored, except in imagination? Do not, therefore, neglect an opportunity to take photographs of every part of your home that you cherish.

In order to succeed in taking interiors, a perfectly rectilinear wide-angle lens is desirable, although not absolutely indispensable. Many amateurs will be confined to the use of their rapid rectilinear or single-view lenses, and, with due care, may be fairly successful; but the best results are obtained with a wide-angle lens. The view of the dining-room, at the head of this article,* was taken with an achromatic single-view lens, and is a good example of what may be done with simple apparatus if proper precautions are taken. A square camera is preferable to one with conical bellows; whenever the latter kind is used, it should be slightly larger than the plate; a 5×8 camera, for instance, will do very well for a 5×7 picture. The camera should be provided with a sliding front and a swing back, as upon these will depend, to a great extent, the obviation of a bane of interior photography, the tilting inward or outward of straight lines at the top. Halation, which was another drawback to the practice of interior photography, has been done away with by the invention of non-halation plates. Ordinary plates may be provided with a non-actinic backing, but, as non-halation plates are not much more expensive than ordinary ones, there is no good reason why the latter should be used in preference to the former, which give no trouble to the amateur.

In interiors, much depends upon the point of view from which the picture is taken. Sometimes there is no choice, as was the case with the photograph which heads this modest essay. Necessity compelled me to take it at an extreme angle from an adjoining room. There was a door directly opposite the sideboard, but, if the room had been photographed from that position, some of the principal features of the apartment would have been excluded; the deer's head, for instance, that lends an additional charm to the room, would have been obscured by the gas globe to the left, which was in a direct line of vision. The door to the left, which is too prominent altogether, could not be excluded; in, fact, the room had to be taken as it was or not at all. By a reference to the illustration it will be seen that the lighting of *A Glimpse of the Dining-room* was from the top, from the direction in which the light usually falls after the gas is lit. This gives a natural look to the room. It is easily accomplished; a magnesium-powder cartridge on top of a step ladder will do the work.

* The pictures, in *The American Amateur*, are very good.—Ed.

After the best point of view has been found, the proper arrangement of the contents of the room must be seen to. Generally, it is best not to move the furniture about too much and to put everything in apple-pie order; it will rob the room of its familiar appearance, which is its principal charm. A little disorderliness oftentimes increases the picturesqueness of the photograph. Much depends, of course, upon the innate tact and taste of the amateur, who must be possessed of the artistic sense in order to secure the best results.

If possible, interiors should be lighted from the side and rear, or, if practicable, from the top. Windows sometimes cannot be avoided; some rooms contain more windows than wall space. If a window is included in the picture, the best thing that can be done is to close the shutters tightly, pull down the shade, and take the room by the aid of light from the side or the rear. Then, when a sufficient exposure has been given, the window may be opened for a few seconds, and in that way a satisfactory image of it obtained. Some do not bother with the window during exposure, but restrain its development by means of a solution of bromide of potassium, applied with a camel's-hair pencil after sufficient detail has been obtained, or reduce it with Farmer's solution in the finished negative. For my part, I prefer to take such a view by flashlight. In no other way could the details of the lace curtain in *A Glimpse of the Dining-room* have been obtained. I have never used a flashlight lamp, but generally have recourse to the magnesium powder cartridges already referred to. I lengthen the fuse of these by attaching a piece of twisted paper thereto, which, when ignited, burns slowly, and enables me to retire to a safe distance before the explosion takes place. Magnesium powder is objectionable on account of the smoke and dust that result from its explosion. I understand that a flashlight lamp has been invented recently that removes these objections, which would greatly facilitate interior photography, and render flashlight more popular than ever. Whenever flashlight is employed for interior photography, the lens should be screened from it. Care should also be taken in lighting it, or burned hands and fingures will be the consequence. The flash of the powder is blinding, hence the face should be averted during its explosion. Some authorities advocate a double flashlight. It is true that a softer effect may be obtained in this manner, but at the expense of a proper distribution of light and shade. It seems to me that the shadows should correspond to the source of light.

When interiors are taken in the daytime, diffused light is preferable to sunlight. Generally, however, daylight is insufficient for photographing interiors, and the amateur can be spared much time and trouble by the use of magnesium powder. I have exposed plates for hours in ill-lighted rooms, and yet, on development, found them to be under-exposed. With flashlight there is no danger of this, and one need not "prowl around the camera for hours to keep intruders away," as Octave Thanet says.

The reflection from picture glass is apt to give one trouble unless the angle of the picture is changed by placing a small wad of paper behind it, or coating its surface with starch. Sometimes the picture will have to be removed, and something else put in its place, before a good photograph can be secured.

I generally focus with a large stop, and then insert the smallest I have. In this manner I secure the detail that is indispensable in an interior.

Whenever figures are introduced in an interior, they should apparently be occupied in some way, as, for instance, reading, sewing, playing the piano, or twanging the strings of a guitar; under no circumstances should they be made to look out of the picture and toward the camera.

Dr. Hugo Erichsen.

LANTERN SLIDES BY REDUCTION, EXPERIMENTALLY DEMONSTRATED.

[Croydon Microscopical and Natural History Club.]

In selecting our title, we make no apology for saying lantern slides by *reduction*, because, although we know that it is, in a sense, somewhat easier to make them by *contact*, yet we think no one will be found to admire a square picture; it is the oblong shape, either horizontal or vertical, that gives the most pleasing results.

Granting this, the next question is, the means to be employed in producing the slide. This may be done either by means of a special piece of apparatus, such as we show you here, and which is called a reducing camera, or an ordinary camera may be used, simply supporting the negative, of whatever size, in a frame perpendicularly in front of it, at the proper distance, and throwing a black cloth over the whole except the negative, which, of course, has to be illuminated.

The distance, of course, will depend partly on the focus of the lens employed, and partly on the size of the negative it is required to reduce. This is very easily found on trial, and, when found, a note of it should be made for future use. Tables also are published, giving distances for different focal lengths and different sizes.

Having now got everything in readiness, our negative in position, and

our lantern plate in its dark slide, the next question is as to the illuminant, and here a further question arises, whether or not we are going to use a condenser; of course, if we employ daylight, no condenser is necessary, but, then, daylight is a very varying quantity, and every one has not the opportunity of working during the hours in which sunlight is available. We are therefore compelled to find other modes of illumination. A simple one consists in placing a piece of ground glass behind the negative, a paraffin lamp *behind and at each side of it* at a distance of some six inches, and behind the lamps, facing the negative at about one foot, a sheet of white cardboard. Another plan is to illuminate the negative, backed with ground glass, by means of the cone of rays projected from an optical lantern.

Where a condenser is available, the process becomes simplified, and the exposure shortened; but it must be borne in mind that for large negatives very large condensers are required: thus, while a six-inch condenser does for a quarter-plate, an eight-inch or nine-inch is required for a half-plate, and at least a ten-inch for a whole-plate, and the price of these rises rather rapidly as the size increases.

The little apparatus we have here we made ourselves, and is available, as you see, for either daylight or artificial light at will, the condenser, for compactness sake, being a six-inch Hughes' rectangular. With this we will now proceed to make an exposure or two, using limelight as our illuminant. The *time* here will be very short, from two to five *seconds* being sufficient, as against two or three *minutes* by daylight, and four to six *minutes* by the reflection method. As in all photographic operations the time of exposure presents the preatest difficulty, no hard-and-fast rule can possibly be laid down; an ounce of practice in this direction is worth more than a pound of theory, but we may say this, that, as in the case of the original negative, *do not under-expose*, err rather in a little over-exposure. A lantern-slide picture should come up readily, with good detail and density, without forcing. It must, however, be borne in mind that a slide intended for exhibition by means of the limelight must be of greater density than one shown by an oil lamp, because of the greater penetrating power of the former.

In the matter of development we have a wide range of agents to select from; hydroquinone is a favourite with some, though, we think, it is sometimes apt to give rather black-and-white pictures. Ferrous oxalate, again, is with many given a preference, but it requires care and *cleanliness* in its use, otherwise we may get a deposit on the film of oxalate of lime from the water, or of iron. True, we can remove these by means of a bath of dilute hydrochloric acid; but, if this is not washed thoroughly out, we shall get a deposit of sulphur when the plate is fixed.

Amidol, dissolved dry like pyro, at the time of using, in sodium sulphite and water, gives very pleasing tones. Metol, too, gives tones leaving little to be desired, and a very good formula for this developer is as follows:—

A.

Metol	100 grains.
Sodium sulphite	2 ounces.
Distilled water to	20 ,,

B.

Potassium carbonate	¾ ounce.
Sodium carbonate crystals	1 ,,
Potassium bromide	40 grains.
Distilled water to	20 ounces.

Dilute with water for less density, and add bromide of potassium in case of over-exposure. Then last, but not least, comes our old friend pyro and ammonia, with or without the addition of ammonium carbonate; as suggested in the formula published by Thomas, a variety of pleasing warm tones are obtainable, thus depending chiefly on the length of exposure.

A matter of importance in a really good slide is the sky portion. Nothing looks worse on the screen than a vast expanse of white, with nothing whatever on it. It is not difficult to print in clouds, assuming that the original negative fails to produce them in the lantern slide. It is only necessary to give a second and brief exposure to a cloud negative, the landscape portion of the slide being blocked out. The cloud negative must be suitable to the subject, taken at about the same time of day, and of course, lighted from the same direction. It is usually unnecessary and undesirable to have very pronounced clouds, unless some striking storm or other effect is to be attained, the object being rather to produce light, fleecy clouds in harmonious keeping with the landscape. Another plan is to print the clouds on a separate plate to be used as a cover glass; but, in this case, the film side of the *negative* must face the condenser and not the camera, *i.e.*, reversed, and this plan has several advantages. It is easier to work, and there is no risk of spoiling the foreground portion of the slide by an unsightly junction.

Should the slide when finished prove to be too dense, or damaged by fog caused by over-exposure and development, it may generally be remedied by placing it for a short time in Farmer's reducing bath, consisting of three drops of a saturated solution of ferricyanide of potassium to each ounce of a ten per cent. solution of hypo, watching very carefully till the desired effect is produced. Here, too, local reduction by means of a camel's-hair hair brush may be made, just as in development local strengthening of the image may be produced by the same means.

If, after all, the image prove too thin, recourse may be had to intensification. The full details of this process were given by us in a paper, published in the photographic journals for April 7, 1893, to which we refer you. The *colour* of the image, too, may be varied, and this is called toning, of which we give you an example or two. By the kindness of Mr. C. H. B. Sparrow, one of our members, we are enabled to show you a few slides toned in the Venus combined bath, by means of which some very pleasing warm brown tones are obtainable. But prevention is better than cure, and it is always advisable to endeavour to obtain a perfect slide in the first instance than to have recourse to a number of processes, which, after all is said and done, are mere photographic dodges.

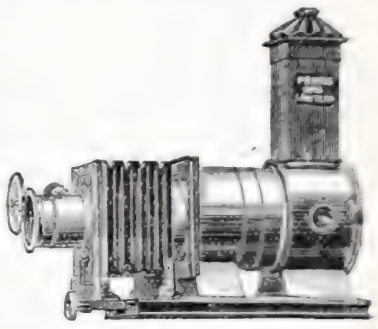
J. H. Baldock, F.C.S.

THE "PRIMUS" LANTERN SPECIALITIES.

W. Butcher & Son, Blackheath.

The "Primus" Lantern.

This lantern is designed for use with ordinary house gas. The body is substantially made of Russian iron and brass, and the front portion is extended by means of a bellows and a travelling base-board. The base and fronts are made of polished mahogany. It has a massive double pinion, double combination achromatic lens, fitted with the incandescent gas burner, with mica chimney; three mantels are supplied with each lantern. The whole is packed in a neat, stained and and varnished case, with drawer for sundries, and with leather-strap carrying handle.

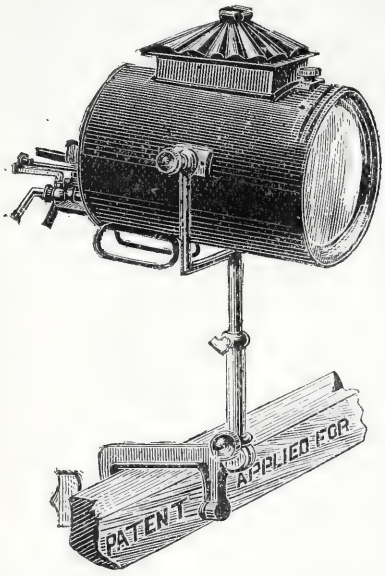


The "Primus" Lantern Stand.—This is a rigid, 2-fold ash rule-joint tripod, folding up into small compass with straps. The head is cut out in the centre, in which the legs fit and are securely clamped; it is provided with a strong hinged tilting table, and tilting screw for raising and lowering the same. The shelf is the great feature of the stand, and is placed inside the legs, fitting on to the stays, by this means clamping all the legs so that it is impossible for them to move, making it perfectly rigid. The shelf is in two pieces, hinged for convenience in packing, and will be found most useful in operating, for holding the slides and other requirements.



The "Primus" Limelight Projector.—This projector can be fixed in almost any position, and is adaptable to every requirement. By its

means the light may be instantly thrown into any position and the colours changed with the greatest ease. The body is made in Russian iron in cylindrical form, fitted with a 6-inch plano-convex lens, Russian iron cowl top (removable for convenience in packing), and tray to carry limelight jet, also provided with slots for the tinters. The support is made in iron, and is arranged so that the body may be fixed into any possible position to a box, ladder, steps, beam, chair back, &c. The stage or object can be conveniently illuminated from the floor or roof or from right or left. The tinters are made in the most convenient shape to assist easy and rapid changing; they are made of very transparent, flexible material, bound in metal rims, and will be found a great advantage over the old glass ones. Six primary colours are provided, by means of which a large variety of tints may be obtained when using two or more at one time.



TO PREPARE "WET" LANTERN SLIDES FOR COLOURING.

The colouring of lantern slides is becoming very much of a fad. We yet adhere to our preference for the "wet" slide. It gives the best projection on the screen, and that is the spot to judge of a slide. A transparency is not a projection. But some colourists have drifted into using the "dry" slide for their results because they have a difficulty in working colours upon the collodion film. Permit us to lend a helping hand:—

To prepare a wet plate lantern slide for colouring either in water-colours or in oils, the following process is simple and easy:—

Cover a quantity of (say half-ounce of Cox's or No. 1 Nelson's) gelatine with cold water; allow it to swell thoroughly, say an hour.

Drain off the excess of water by covering the vessel with a thickness of cheese cloth. Do not press the excess of water off, merely drain it and take time.

Set the gelatine in another dish containing hot water until it melts; then take it out and stir in alcohol (use photographic 95°) slowly until white follows the addition. This you redissolve by dropping in hot water in the same manner.

Filter through two thicknesses of cheese cloth into a wide-mouthed bottle. If too thick to flow when warmed for use, add alcohol and water as before, wet the binder of the slide on its edges, and scrape it off from the glass. Flow the surface of the slide with alcohol, one part; water, two parts; then follow with the gelatine solution twice or more.

Dry on a rack or on nails in the wall—do not use heat. Work carefully, and all things clean.—*Wilson's Photographic Magazine.*

COLOUR PROJECTION.

Mr. R. D. Gray, who recently showed some charming natural-colour optical views in New York, thus describes his process: "I take each negative separately, one after the other, as quickly as possible, which requires, including the time for changing the plates and screens, one and a half minutes. To combine or superimpose the pictures is not a serious matter if suitable apparatus is provided for it. I make ordinary positives on glass for lantern projections, and secure one of them in a wooden frame which contains spaces for three other slides. To the next one I attach a mechanical device, with very delicate screw adjustments, by which it can be moved in any direction. The operator at the lantern now moves the picture, as directed by an observer near the screen, until its position is identical with the first, when it is said to be 'in register,' and is sealed in that position. The operation is repeated until all are finished. Each frame is used as an ordinary lantern slide, but in a lantern built with a corresponding number of optical systems, with provision for inserting coloured glasses in the paths of light, each of which should be of a similar colour to that used in taking the negative. If three positives are used, and they are equally transparent in one part of the picture, the red, green, and blue lights passing through that part will appear white on the screen. If the blue positive is more opaque in that portion of the picture, the red and green lights will predominate, producing yellow; or, if the green positive should be opaque, the red and blue lights in excess make purple. Thus the varying degrees of opacity in the positives, caused by the selective qualities of the photographic plates and colour screens, however slight, are effective, and the resulting picture shows the delicate tints as well as the brilliant colours of nature."

THE POLYORAMA.

The sensation of the past month in Melbourne, says *The Australian Photographic Journal*, has been the series of entertainments held at the Town Hall in connection with the Village Settlement Scheme. The Revs. Canon Tucker and Dr. Strong have rendered themselves personally liable for a large debt incurred in placing so many people on the land, and, in order to liquidate this, these entertainments were organized.

The hall was, for the time being, called "The Temple of Light," and among other scientific novelties, what the committee called "The Polyorama" was exhibited. This consisted of a number of large screens arranged in a semi circle, in the centre of which was a set of lanterns, each lantern projecting its own picture on to a separate screen, so that, instead of the spectators confining their attention to one view at a time, they could examine half a dozen, which were kept on the screen while they were described, after which a second number were shown, and so on; this rendered the description of a series of consecutive views of one particular locality, or illustrating one subject, more easily and better understood. The pictures, of course, suffered in brilliancy by reason of the light from each being reflected on to the others, but the idea was novel and proved attractive.

Temperature of the Electric Arc.—In a paper read before the Royal Society *On the Effect of Pressure of the Surrounding Gas on the Temperature of the Crater of an Electric Arc Light*, Mr. W. E. Wilson states that of late years it has often been assumed that the temperature of the crater forming the positive pole of the electric arc is that of boiling carbon. The most modern determinations give that point as about 3300° to 3500° C. In order to investigate whether increased pressure in the gas surrounding an electric arc would raise the temperature of the crater, he used a strong cast-iron box, in the interior of which an electric arc light could be maintained. By increasing the pressure of the gas in the box, the temperature of the crater is considerably lowered instead of being raised, and the experiments seem to show that the temperature of the crater, like that of a filament in an incandescent lamp, depends on how much it is cooled by the surrounding atmosphere, and not on its being the temperature at which the vapour of carbon has the same pressure as the surrounding atmosphere. That carbon volatilises in some form at comparatively low temperatures seems likely from the way in which the carbon of incandescent lamp filaments is transferred to the glass. The pressure of the vapour of carbon in the arc may consequently be very small, and further it would seem that the supposition of high pressures in the solar photosphere is not borne out by these experiments, and that carbon may exist there in the solid form at very high temperatures, although the pressures are comparatively low.

Acetylene: its History and Uses.—The discovery of acetylene by Berthelot, something like half a century ago, takes us back to the time when investigators of Liebig's school and following were laying the foundations of many modern industries, and it was within what may be called the Liebig period of research that Wöhler prepared calcium carbide, or "calcium acetylene," from inorganic materials. By decomposing it with water he produced acetylene together with slacked lime. In the hands of laborious workers, especially Berthelot, a first step in the vast field of synthetical organic chemistry; consequently the recent production of calcium carbide on a large scale in America becomes a step in progress calculated to immediately fructify. Portraiture by the light of burning acetylene promises to become a matter of every-day practice as the dark evenings come on, combustion of the gas at the rate of five cubic feet per hour being, according to Professor Vivian Hewes, sufficient. Five burners are used, each burning about one foot per hour. A danger to be guarded against in the use of acetylene is its tendency to form dangerously explosive compounds with copper, silver, gold, mercury, and several other metals.—*Thomas Bolas, in the 'Photographic Times.'*

Messrs. Newton's Supplementary List of Lantern Slides, Season, 1895–96.—We have received this supplementary list, which includes particulars of several new and interesting series of slides of great technical value, including *Allotments—Garden Produce; Hygiene; Human Physiology; Volcanoes; Battles of the British Army; Flying Bullets; History of Old London.* A specially good series is that, from photographs by Mr. T. E. Freshwater, F.R.P.S., illustrative of ancient and modern methods of hop cultivature, and the various operations incidental thereto.

Mr. E. G. Platt, of Birkbeck-road, Kingsland, writes:—"Owing to the immense increase of my business, I have been compelled to enlarge my factory, and have laid down another plant of machinery, which I hope will now enable me to give greater satisfaction to my customers, than heretofore, in the prompt delivery of their kind orders."

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*November* 1, 1895.

THE LANTERN RECORD.

CONTENTS.

	Page
THE SEARCH LIGHT. By RADIANT....	81
LANTERN MEMS. By G. R. BAKER	82
MICROSCOPE FOR THE EXAMINATION OF OPAQUE OBJECTS	83
THE INCANDESCENT GASLIGHT AS AN ILLUMINANT. By JOHN A. HODGES, F.R.P.S.....	83
ELECTRIC LIGHT FOR LANTERN WORK. By CECIL M. HEPWORTH..	85
LANTERN-SLIDE MAKING	87
A NEW FORM OF LANTERN	87
NEW COMBINED "CUT-OFF" AND FINE ADJUSTMENT VALVE	88
BROWN'S POCKET STEREOSCOPE	88
DAY'S PORTABLE STEREOSCOPE	88

THE SEARCH LIGHT.

At Mr. Henry Van der Weyde's studio, 182, Regent-street, on Friday evening last, M. Alexandre, of Brussels, gave, before a special informal meeting convened by the Linked Ring, a display of lantern slides of his own production. Many of these were of military subjects, and were noticeable for the almost stereoscopic relief M. Alexandre had succeeded in imparting to the figures of horses, soldiers, &c. Interest, however, chiefly centered in a series of slides representing studies of the nude, so coloured as to give flesh tints of remarkably lifelike effect. The process by which this was brought about appeared to be as follows:—The transparency is coated with white wax, which is carefully scraped away on the part of the film where the figure appears. The picture is then immersed in a solution of uranium nitrate—the ordinary uranium toning or intensifying solution answers—and, when the desired depth of tint is obtained, the action is stopped, and the wax is dissolved off the film by benzine. M. Alexandre's coloured nude studies were very much admired.

* * * * *

Answers, of October 26, has an article headed *How Bank Clerks Use the Stereoscope*, in the course of which it says:—When a note is supposed to be counterfeit, and other simple tests have been tried, the suspected forgery is put into the instrument named side by side with a genuine note of the same value. When the two images are superposed, and the glass is looked through carefully, the difference between the forgery and the reality is seen at once, for, of course, the two pictures do not blend, and the very minutest shade of difference in the engraving becomes glaringly apparent. The writer lately sought out the manager of a most important provincial bank, and the latter said on this point: "I have never known a good stereoscope to fail. Differences that are quite imperceptible to the naked eye come out at once, and the two pictures do not blend into one, as do photographs or two absolutely genuine notes. I always keep the instrument at hand, and use it when I have the least doubt." By means of a forged note of cunning devising and a real one, this gentleman demonstrated in the most striking way to the writer how easy is detection by means of the stereoscope.

* * * * *

Having devoted a considerable part of a scanty leisure to the study of stereoscopic theory and practice, I was beginning to imagine that I knew something of the subject, but the interesting article in *Answers* convinces me that I have yet much to learn upon it. It all amounts to this, if what is said in the article is correct, that the stereoscope possesses the hitherto unsuspected power of "blending" or coalescing two absolutely similar images. There are also other points in which there is a distinct conflict with theory. As to the practical aspects of the matter, I am unable at present to say anything, as I have just run out of bank-notes, and, of course, nothing but real and unimpeachable flimsies would do for such an experiment, eh, Mr. Answers? Ordinary printed matter, such, for example, as two copies of portions of your front page, would be too cheap and common for demonstrating the philosophy of the new stereoscopy, I suppose?

* * * * *

At an early date the members of the London & Provincial Photographic Association will have an opportunity of seeing coloured stereographs on the screen. This, as the phrase runs, "goes one better" than Mr. Anderton's system.

* * * * *

A contemporary has the following note on the dangers of ether:—

"A dispatch from Warsaw proves that a bottle of ether is not a desirable companion in a railway carriage, particularly if the vehicle be heated by a stove. A man carrying a vessel full of ether in a railway train dropped it, and in the explosion which occurred three persons were killed, and seventeen others received serious injury.

* * * * *

Photographers may be interested in knowing the effect of various coloured glasses on the cultivation of strawberries. Says a writer in a contemporary:—

"In cultivating strawberries under glass of various colours, Professor Zacharewiez, of Vaucluse, France, has obtained the following results:—Ordinary clear glass gave the best and earliest fruit; orange glass increased the vegetation, but injured the quality, size, and earliness of the fruit; violet glass increased the yield at the expense of the quality; red, blue, and green glass were hurtful to all kinds of vegetation."

* * * * *

Mr. Jerome K. Jerome has been very roughly handled over a passage of his new play, *The Rise of Dick Halward*. A traveller has taken a hand-camera shot at a dying man writing a letter, and it is pretended that, by microscopical examination, the writing, which has an important bearing on the plot of the play, can be deciphered. The incident, of course, is as far-fetched as the photography of it is shaky. Mr. Jerome should hasten to put himself right with the critics by making his amateur photographer say that his lens and camera were very long-focus ones, and that the former was set for near objects, or that there was a powerful tele-photo negative attachment to it, or that the dying man wrote, like Tony Weller, a very big hand, and printed his letters. There are several ways of making

the photography of the play presentable; but, as I have already said, the whole incident is far-fetched, and ought not to be tolerated by an intelligent audience.

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Oddly enough, Mr. Jerome's severest critics are found among the writers for the theatrical papers. The daily press denounced his photography with delightful unanimity. A writer in *The Stage*, himself apparently a photographer, said: "I have not yet had the opportunity of witnessing Mr. Jerome's play, but I learn that photography is utilised to confound the wicked, and that, under the microscope, the wording of the letter seen in the picture taken by a snap-shot is supposed to be decipherable. Permit me to say that, after a certain point, enlargements by means of magnifying glasses become blurred and indistinct, and it is never possible to get clearly the minute detail. A microscope is, of course, more powerful than any enlarging apparatus, and its revelations are very different to the generally supposed idea when a photograph (the negative) is placed beneath it. The powerful lenses go beyond bringing out details of the picture, such as the wording of a letter. Instead, the fibre of the collodion, the granulated crystals of the silver salts—more or less oxidised by exposure—will be seen; and, for such purposes as Mr. Jerome supposes in his play, the experiment is useless. With a paper picture the result will be even less effective; the minute details do not always print, and what would be seen through the microscope would be fibre of the paper and the rough surface, which to the naked eye appears the perfection of polish. When one considers how small are the majority of snap-shot pictures, the incident becomes almost impossible, and one would also like to know the positions of the photographer covertly focussing a man writing a letter, which letter is to be readable in the finished picture."

* * * * *

The "fibre of the collodion" and the "granulated crystals of silver salts," in connexion with hand-camera negatives on gelatine dry plates, is funny—very funny. However, the writer means well, and in the main is intelligible.

* * * * *

"Carados," in last Sunday's *Referee*, is very hard on Mr. Jerome's photography. He says:—

"The remarks made last Sunday in the *Referee* concerning the unlikely episode of the photograph in *The Rise of Dick Halward* were generally endorsed in the daily papers on Monday, and the author of the play, taking himself too seriously, has since then stated publicly that that which the critics pronounced to be incredible he has himself proved to be possible. He avers that he experimented in photography for the express purpose of satisfying himself that a snap-shot of a man writing a letter would reveal, under a microscope, the words on his sheet of paper. Now, it happens that I have myself experimented in photography, and I have before me, as I write, a photograph of a man holding a newspaper in his hand, and I will defy Mr. Jerome, or anybody else, to read anything of that newspaper under any microscope ever yet invented. And my photograph, mark you, was taken with care and with a first-rate camera, not in a random way with a mere Kodak. But Mr. Jerome presumably has not been experimenting with an ordinary Kodak, but with a most extraordinary Kodak, and I should like to know the name of it—'not necessarily for publication.' I will not do Mr. Jerome the injustice to add, 'but as a guarantee of good faith.' At the same time, it would be interesting to know in what position that dying man in Mexico was holding his letter. As his face is said to be so well caught with a snap-shot, I assume that the letter was not held up before the face of the dying man, with the writing turned towards the photographer. I should as lief expect a photograph or a microscope to enable me to read the name of a man's hatter through the crown of his hat as to decipher a letter held at an angle that must prevent the words from being reproduced in a photograph."

This is very trenchant and forcible criticism, but not a whit too severe. For Mr. Jerome is, as a rule, such an astute and clever writer that he is scarcely to be pitied for the drubbing he has received in persisting in his original blunder. But what must, above all things, be pleasing and gratifying to photographers is to find that a knowledge of photography is spreading even to those dense and prejudiced gentlemen, the dramatic critics. Still, why "mere" Kodak?

In exhibiting an ether saturator recently before the Society of Amateur Photographers of New York, Mr. Schnadig remarked that "ether saturators are very popular in England, but are used very little in this country (America), perhaps because with us the price of hydrogen is so small in comparison with the cost of oxygen."

* * * * *

At a subsequent meeting of the same Society Mr. Riley said he found it wasn't any cheaper to run the ether jet in the United States than the mixed jet, because in the United States hydrogen gas is practically given away, while in England the same price is asked for each gas.

* * * * *

Evidently English lantern slides are regarded as of high quality in the States, for here is an opinion of the set sent over from this country for the American Lantern slide intercharge:—"There has been received an excellent selection of slides from the affiliated Societies of the Royal Photographic Society of London, which is replete with good work. The paucity of description on the list regarding notable places is the only fault that can be found. There are examples of interior work on non-halation plates that are remarkable for their beauty of tone and gradation. All experts in slide-making will profit by seeing this set." Radiant.

LANTERN MEMS.

I was hoping to be able to announce the result of the considerations and deliberations of the Home Office Committee that has been sitting on the compressed gas business; but, although their labours are ended, the patience of the lantern world will have to be exercised for some little time longer, and it will probably be well on in November before the report is published.

* * * * *

Notwithstanding certain further restrictions contemplated by the County Council with regard to the use of the limelight in theatres and halls under their control, and which has been somewhat fully described by a writer on lantern matters, I find, on inquiry, that the only prohibitions and regulations really in force (and they are quite enough) are the following, which I reproduce as being of importance to lantern operators, for one may never know when it may be necessary to have to employ a limelight under the jurisdiction of the much talked-about, if not dreaded, Council.

* * * * *

County Council Regulations.—Theatres, Music Halls, &c.—(5) "That the present arrangement for limelight be discontinued, and, if limelight be required, proper tanks provided, placed in ventilated brick chamber, fitted with iron doors and frames; that the hydrogen and oxygen gases be placed in separate chamber; that the screws to the holders of each gas be of different diameters; that the stop cocks be fixed at the lenses and to the supply pipes on the stage level; and that flexible iron tubing, with screw connexions, be substituted for the existing rubber tubing."

* * * * *

On pointing out to the representative of the Council whom I saw that it was not usual to have fittings of two different sizes, but that gas cylinders were supplied with right and left-handed screws, I was told they would be permitted, but as regards the jet to be used, it having been stated in the article in question that only blow-through jets would be allowed to be used, I pointed out that high-pressure mixed gas jets were really the only practical ones for the purpose, and perfectly safe with compressed gas, and received the answer that no stipulation was in force for any specified form of jet.

* * * * *

Talking of jets brings me to a form of jet that will soon be popular, if found to be perfectly safe in use, and that is what will be called "injector" or "ejector," but which will probably be found to

be a modified form of mixed gas jet, carrying on the gas after being mixed or broken up in a chamber far removed from the point of ignition, the hydrogen being supplied direct from the house supply at the ordinary low pressure, and then driven forward by oxygen at an extra high pressure. The best results are obtained by a screw-down regulator fixed direct on the cylinder, or else from an automatic regulator, such as Beard's, modified to give a much higher pressure.

* * * * *

No doubt they will be most useful jets for use with single lanterns in places where the gas is laid on, but whether a pair of them can be used in biunial lanterns remains to be seen; and, if dissolving is to be performed, a special kind of gas dissolver, suitable for the higher pressure, will have to be constructed. Some of the plans employed in America will, no doubt, assist in making a suitable model.

* * * * *

THE flexible metallic tubing, now its use is insisted on by the County Council, will, no doubt, be more popular among lanternists, for the connexions to the jet and dissolver can be made gaslight-tight by means of a special fitting and clamp supplied for the purpose. Indiarubber tubing is often a source of trouble, on account of its getting hard and remaining stretched, and so causing an escape of gas.

* * * * *

ACETYLENE gas has been put to a new use and, if the earlier experiments are verified, it will prove of great service to science in relation to photometry. It appears a certain definite area of flame becomes a standard unit, and there is every chance of the much-vexed question of a given candle power being settled by its use.

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THE Lantern Society held their first meeting for the season on October 14, when many representatives of the trade, who had been invited to exhibit, explained the respective novelties. Mr. Askew had an ingeniously contrived portable lantern for limelight purposes, in which the mahogany body was made to form its own box for travelling. It was also provided with a microscopic attachment and steadying fittings for fixing to the tripod stand to ensure rigidity.

* * * * *

MR. BUTCHER showed some tinted covers for lantern slides, also a convenient stand for optical lanters, and explained the attachment for incandescent gaslights for projection purposes. Owing, however, to the room being entirely dependent on electricity for light, a demonstration could not be made, as the pressure from the compressed hydrogen, when passed through a regulator, was far in excess of what is useful for this light.

* * * * *

THE writer explained, on behalf of Mr. J. H. Steward, an improved lantern made to give all possible facilities for using the Davenport arc lamp to the best advantage, the tray having a lateral adjustment for centering from outside the lantern by means of a brass milled head actuating a screw. A new "cut-off" and screw-down valve, fine adjustment combined, was also shown, as were a new high-power jet, and some extra large diameter (1¼ inches) lime cylinders that, with the compressed gas and large-size mixing-box jets, give a considerable increase of light. These are made from extra hard lime that is very durable and also rich in actinic properties.

G. R. BAKER.

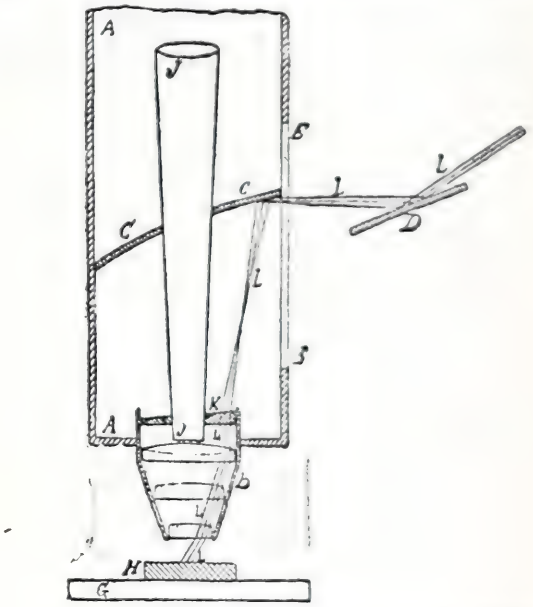
MICROSCOPE FOR THE EXAMINATION OF OPAQUE OBJECTS.

SEVERAL attempts have been made up to the present time to devise apparatus for the illumination of opaque objects examined under the microscope. One of the best known processes is that of Lieberkuhn, which consists in applying around the objective an inclined concave mirror, which concentrates the luminous rays in reflecting them upon the preparation. This apparatus cannot be applied unless the frontal distance of the objective is sufficient to permit of the passage of the luminous rays sent obliquely. It can, therefore, be employed only for feeble magnifications. Moreover, such oblique illumination is an inconvenience.

Mr. Charles Fremont has succeeded in effecting the illumination through the interior of the tube of the microscope and the objective, so that this new method is applicable to even the strongest magnifications.

The arrangement adopted, as described to the Academy of Sciences, through Mr. Marey, is as follows:—

The pencil of light, L, directly projected or reflected by the mirror, D, enters the body, A, of the microscope tube through an aperture,



E E, and meets a concave mirror, C, which is movable and capable of being raised or lowered in order to send the light through the lenses of the objective, B. A prism, K, is interposed in the path of the pencil in order to right it and render it parallel with the axis of the microscope before it enters the objective.

The mirror, C, and the prism, K, are provided with an aperture to permit of the passage of a conical tube, J, that allows one to perceive, through the ocular, the image of the preparation, H, given by the objective, B, so that such image is never met by the luminous pencil.

This process permits of obtaining a vertical illumination of great intensity and of perfect clearness, both qualities indispensable for photographing microscopic images.

In presenting this apparatus to the Academy, in behalf of Mr. Fremont, Mr. Marey recalled the experiments that he had made toward reproducing microscopic beings by chronophotography. With ordinary illumination, the objects detach themselves from a luminous ground, and successive photographs of them can be taken only upon a movable film. The series of images thus obtained include, it is true, all the data necessary for determining the changes of form and position of the object in motion; but, in order to appreciate such changes, it requires considerable labour in the way of comparing the images, which are intimately connected in a long series. For such studies it would be preferable to have recourse to chronophotography upon a dark ground, which, upon the same immovable plate, reunites the successive images of the object.

This method, which has been applicable only to objects of large dimensions, will perhaps, owing to Mr. Fremont's new instrument, be applicable to microscopic photography. Should such be the case, a great progress will certainly be made in our knowledge of the motions of microscopic beings.—*Scientific American.*

THE INCANDESCENT GASLIGHT AS AN ILLUMINANT FOR THE ENLARGING LANTERN.

[Croydon Camera Club.]

A GOOD many inquiries have been made during the past few months as to the suitability of the incandescent gaslight for enlarging, and the possibllity of employing it for such a purpose. As it is both eminently suitable and easily adaptable, a few practical suggestions, gleaned from twelve months' experience in the working of the

system, may not be unacceptable to those who may be contemplating its adoption.

You are probably familiar with the light, for it has recently attained to a popularity, from a purely commercial point of view, that is little short of marvellous, and in very many instances has replaced the electric light. This sudden rise in public estimation is the more surprising when we recollect that it had been for several years before the public before it came into anything like prominent favour.

I need not describe the principles of the light in detail. It consists of a woven mantle of zirconia, which, when suspended in the flame of a Bunsen burner, becomes incandescent, and produces a brilliant, steady, and very actinic light of great intensity. The burners are made in three sizes, designated respectively S, C, D; the C burner is the one most suitable for enlarging purposes, the S being too small, and the D too large. The candle power of the C varies from 50° to seventy candle power, and is ample for ordinary enlarging work.

The ideal illuminant for enlarging purposes is most perfectly realised in a small arc light, in which we have the area of illumination reduced to the smallest attainable magnitude, combined with great intensity and penetrative power. Taking these as typical of the most favourable conditions of artificial illumination, and passing in review other available illuminants, we have, in a descending ratio of efficiency, the various forms of lime light, mixed jet, blow-through and oxycalcium lamp, multiple wick lanterns, and, finally, gas.

It is not my intention to discuss to-night the merits and demerits of these different systems of lighting; each has its advocates, its advantages and disadvantages. Limelight, for those who are familiar with its manipulation, and possess the necessary plant, will answer all the practical requirements of the enlarger; but many photographers desire to practise enlarging who are totally unacquainted with the working of the lime-light, and who possibly do not care to go the expense of providing themselves with the necessary apparatus for producing it. For such it may be said the multiple wick lamp will meet the necessities of the case. Oil lamps have probably, owing to the foregoing reasons, been more largely used by amateur workers for enlarging purposes than any other means of illumination up to the present time, and, in the absence of a better illuminant, they have doubtless served a useful purpose in the past.

But only those who have used them can form any idea of the discomfort and inconvenience which are inseparable from their use. As originally constructed, the illuminating power was comparatively feeble, but improved methods of construction have greatly enhanced the intensity of the light, though, unfortunately, they have increased, *pari passu*, the heat engendered during combustion. Indeed, some of the new four-wick lamps, whilst affording a splendid light, at the same time give off a sufficient amount of heat to enable ordinary culinary operations to be easily carried out.

But, apart from the inconveniences of heat and smell, there are other and more serious objections to the use of parallel or multiple wick lamps. The principles upon which they are constructed are such that, the greater the intensity attained, the larger is the area of the illuminant. Not only does this mean a serious loss of light, but other difficulties are introduced in the shape of unequal illumination, flare and flickering, to say nothing of the inevitable loss of definition that must ensue. In saying this I have not the smallest wish to depreciate the utility of this form of lantern light, nor to underrate its efficiency. I consider that in its best form, as exemplified in the lamps of several well-known makers, it is a most valuable addition to our resources, and one which is very far from being despised.

Now, you will naturally ask me, In what respects is the incandescent gaslight superior to oil lamp for enlarging purposes? In the first place, it is cleaner, more handy, at once ready for use, has greater intensity, is more actinic, and gives far less discomfort from heat.

Let me deal with these points a little more in detail. That it is cleaner will be obvious to any one who has had to do with the oil lamp. We know that, with the latter, however careful we may be in keeping the lamp and lantern clean and free from oil, the volatilisation of the latter, which cannot be prevented, must always produce some small and consequent annoyance. On the other hand, there is no appreciable deposit of carbon in the chimney of the lantern after the incandescent light has been in use for more than twelve months.

It is certainly more handy, for, once fitted to the lantern, it is always ready for use at a moment's notice, merely requiring to be connected to the nearest gas bracket with a piece of indiarubber tube, whereas the efficient performance of an oil lamp will depend upon the degree of care with which it has been kept clean and the wicks properly trimmed, the latter an operation which consumes a considerable amount of time.

Although the actual measured intensity of the incandescent gaslight is not so great as in one or two of the best forms of oil lamps, the slight loss in this respect is more than compensated for by the gain in actinism, with the result that the exposure is considerably shortened.

The light of an oil lamp will look quite yellow by comparison with the incandescent gas, and if two small-sized discs—one illuminated with the lamp, the other with the incandescent gas—are compared, the latter will be found remarkably whiter and apparently brighter, though the actual intensity of candle power of the light may be less in the one case than in the other.

I have already explained to you the nature and principle of the light, but a word or two about the mantles may not be without value. The idea seems to have become rather general that, owing to their extremely fragile nature, a large annual outlay will be required to maintain that.

This would be a very serious consideration if true, but the fragility of the mantles has been very greatly exaggerated. That they are exceedingly delicate—a mere filament, in fact—is, doubtless, true, but if not touched, or interfered with, or subjected to a sudden or violent jar, they will last for months.

The suspension of the mantle to the touch allows sufficient play to prevent any slight shock which may occur in ordinary use from causing its fracture. Where the enlarging apparatus can be set up permanently in the dark room on a bench or table, it is a good plan to have the burner fitted with a bypass, the extra cost of which is merely nominal, and the increased consumption of gas so small as to be almost negligible. If any evidence of the strength of the mantle is necessary, I might mention that I have had one in use in a sitting-room at home for over twelve months, and when I tell you that I took this particular mantle down to the Clapham and Brixton Camera Club, where I gave a domonstration, and, that it safely survived the double journey on the London and Chatham and Dover Railway, further evidence of the strength of the mantle will hardly be required.

It is true that sometimes a weak mantle is met with, but this lack of strength will generally show itself by a crack when it is first lighted.

A cracked mantle may last for weeks, or it may fall at the first slight jar; a sound mantle may reasonably be expected to last for nine months with perfect efficiency, and possibly much longer.

There are two ways in which the light may be employed for the purpose of enlarging, both of which I have tried and found to give complete satisfaction. They both will probably be familiar to you, but a brief description will perhaps be of service to those seeking information on the subject. The first method dispenses with the condenser, the negative being strongly illuminated by light reflected from a pure white surface placed behind it. The diagram will make the construction of the apparatus clearer. A A is a large box which forms the body of the apparatus; it is unnecessary to give exact dimensions, but it must not be made too small, or overheating may result. The back, B B, must have a pefectly smooth white surface; plaster of Paris, rubbed down with the finest sand paper and then painted a dead white, has been found to answer well. In the centre of the front of the box should be placed an ordinary carrier to hold the negative which is to be enlarged. An incandescent gaslight is placed at each side, behind the negative carrier, in such a way that the white surface of the back of the box is evenly and strongly illuminated, side wings being so placed from passing through the negative. This system has the merit of extreme simplicity, its construction being within the capabilities of any amateur who can handle a hammer and screwdriver. By its aid most excellent enlargements may be secured, the only drawback being the length of the exposure, which necessarily is considerably longer than when a condenser is employed. As regards definition and evenness of illumination, the results are quite comparable with those produced with a condenser. The enlarging lantern of the Ealing Photographic Society, built on these lines under the supervision of the late Mr. Whiting, has given, I believe, very great satisfaction to the members. Its efficiency has been recently improved, and, since the installation of the electric light by the Corporation of Ealing, two small arc lights have been substituted for the two incandescent gaslights, with the result that the exposure has been very considerably shorter. The principle of the construction, however, remains the same.

I will now deal with the method in which a condenser is employed. This form of enlarging apparatus, as you are aware, is identical in principle with the ordinary optical lantern, which instrument, indeed, will, if certain slight alterations are effected and the negatives are of

sufficiently small size, admirably answer the purpose. As an illuminant for this system the incandescent gas answers most admirably and well deserves all the praise I can bestow upon it.

It may easily be adapted to any lantern or enlarging apparatus, but it is necessary to provide the usual mechanical adjustments, in order that the accurate centring of the light may be easily effected. I may say that the Incandescent Gas Company themselves undertake the fitting of lanterns with their light, and recently several manufacturers of lanterns have brought out special fittings, which are easily adaptable to any lantern.

Very little alteration of the lantern body will be required; in any case a light trapped chimney will be necessary, as in most modern lanterns. The chimney is fixed to the lamp, and not to the lantern body.

Whether the light is to be used for ordinary projection purposes or for enlarging, it is actually necessary to see that white light does not escape into the room in which the lantern is being used. A few words on the use of the mantle. It must be carefully taken from its case and hung upon the crutch, care being taken only to touch the mantle by the loop. Before replacing the chimney and turning on the gas the mantle must be what is technically called "flared off." This is done by carefully applying a light to the top of the mantle, the composition with which it is coated will then evenly down. When the mantle has cooled, the gas may be turned on and the burner lighted by applying a light to the top of the chimney. A word of advice with regard to the latter, and that is, Buy a talc chimney at starting and avoid the glass only. The latter, however well made, are constantly fracturing, often to the detriment of the mantle. The additional cost of the talc chimney will soon be saved in the absence of breakages, which inevitably occur with glass. Some persons seem to be under the impression that an extra pressure of gas is necessary to produce a good light with the incandescent-gas system. This, however, is quite a mistaken notion, for the normal gas pressure is not only sufficient, but often too great, and a better effect will frequently be obtained by slightly reducing it.

I have said very little about the duration of exposure, for the reasons that the factors, which must always be taken into consideration, vary so enormously. I refer to the density of the negative, the speed of the sensitive material used, and the degree of enlargement. It will, however, be found that, as compared with an oil light of good quality, the exposure with the incandescent gaslight is very considerably shortened. As an example, I may say that enlarging from a quarter-plate negative of average density to 12×10 on rapid bromide paper, with a lens working at f 8 from two to three seconds is ample.

I would only add, though I trust it is unnecessary for me to do so, that I have no pecuniary interest of any kind in the success or otherwise of the Company, my only object being to point out some of the advantages of the light for enlarging purposes to my brother photographers.

JOHN A. HODGES, F.R.P.S.

ELECTRIC LIGHT FOR LANTERN WORK.

III.—THE ALTERNATING CURRENT.

HITHERTO I have only spoken of continuous current electricity, electricity which always flows in one direction, so that one of the wire leads is always positive—the other always negative. But this review of the electric light applied to the lantern would be in no wise complete were not due consideration given to the alternating current, for this form of electricity—and it is often to be met with—requires several modifications to be made in those statements regarding the direct current, before they will be applicable.

The alternating current is so called, because instead of maintaining one direction around its circuit, it is continually flowing backwards and forwards, first in one direction and then in the other, with very rapid alternations. It will thus be seen that what is at one moment the positive pole, or terminal, is in the next, the negative. Consequently, in the case of an arc light worked from such a current, the two carbons, are continually vying with one another as to which shall develop the positive crater, and which the negative point, and as they both change their minds, so to speak, about a hundred times a second, they naturally 'don't get much forrarder.' It is like a tug of war in which the two sides are so equally balanced that neither gains the slightest advantage over the other.

This would be all very well in its way, but unfortunately it does not end here, for every time they change their minds—to continue the metaphor—they give a kind of little hiss or spit, and these little spits occur with such frequency and perfect regularity that the result is a loud musical note or hum, that sounds for all the world as if there were a mosquito as big as an apple shut up in the lantern and he didn't like it.

The result of this difference of opinion between the two carbons is that they settle down to a compromise, and each forms itself into a blunt point. However, they don't seem to feel easy about it, and

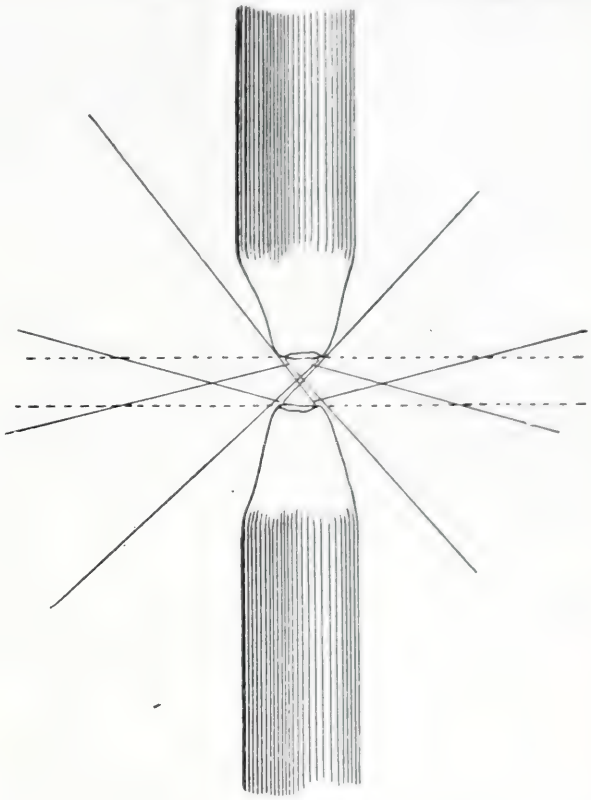


Fig. 2.

the arc develops a tendency to wander round and round in a circle on the edges of these blunt points, a tiresome propensity which I need hardly say has a horrible effect upon the screen. To overcome this defect, it is customary in lamps used for ordinary lighting

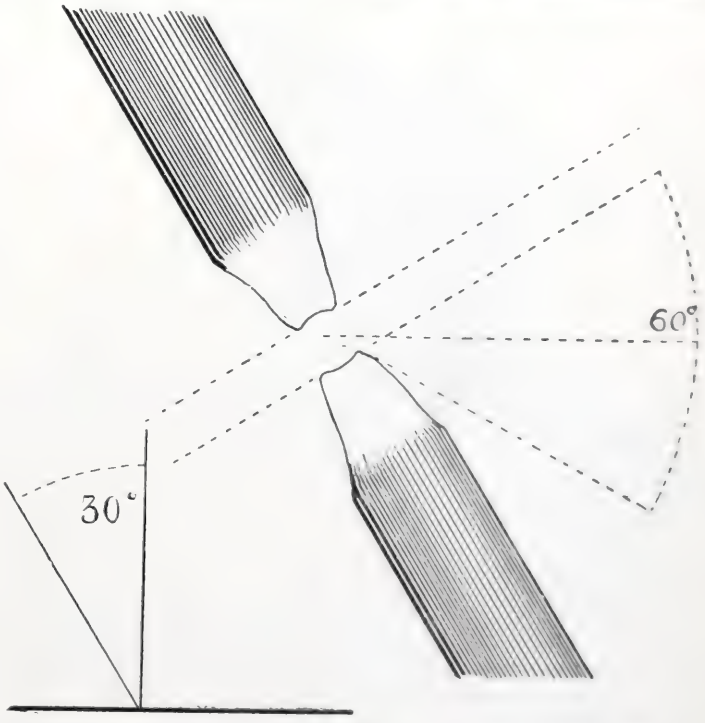


Fig. 3.

purposes to use cored carbons, that is to say, very hard carbons with an internal core of a softer material. This causes a crater to form on the end of each carbon rod, and the arc confines its attention to this crater and ceases its peregrinations; but, unfortunately for lantern workers, the remedy is almost as bad as the disease, for, though

these two craters throw out any amount of light in upward and downward directions, the horizontal illumination is almost *nil*. The reason for this will be better understood by reference to the cut. It will be seen that the upper crater projects all its light downwards, while that from the lower is all in an upward direction. Horizontally, only the arc itself coupled with the outside edges of the crater are able to yield any light, and, these being comparatively cool, the illumination is there very poor. The effect upon the screen is that of a dark purple band of shadow right across the middle of the sheet. It owes its mauve colour to the fact that the greater part of the light at this point is derived from the electric arc, and not from incandescent carbon. This state of things can, of course, be remedied by tilting the whole lamp backwards through an angle of thirty degrees or so, so that only the rays from the upper crater reach the lenses, but this necessitates the absolute waste of half the available light, which, when at all a large screen has to be covered, would be of extreme importance.

There is another method which I have tried with partial success, and to which, I believe, recourse might with advantage be had in those cases where only alternating current is available. The idea is this: As has already been explained, if two cored carbons be employed, a crater will form at the end of each, and light will be freely radiated up and down, but not horizontally. Now, if by any means the arc can be induced to play only at one side of the carbons, they will burn away more at that side, and the two craters will be tilted away from one another, as shown in fig. 3. An arc due to

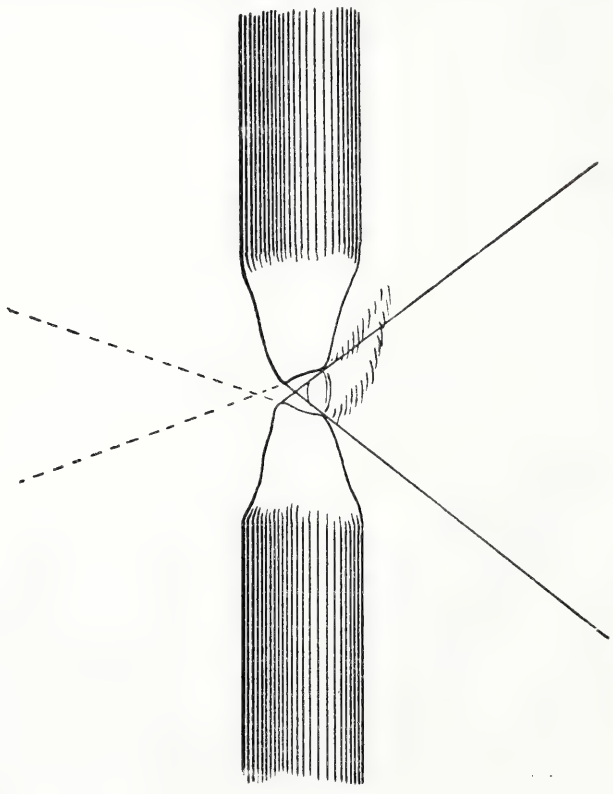


Fig. 1.

direct current electricity is very strongly affected by an ordinary permanent magnet, which exerts a powerful repellent action upon the flame. By holding a small magnet near the carbon points, the arc is immediately "blown" to a position farthest away from it, and, if the magnet be brought nearer, the arc will be blown out altogether and extinguished. No such effect is observable where the alternating current is used, and, in order to produce the phenomenon, it is necessary to employ an electro-magnet, excited by the same current as that which produces the arc.

The simplest form of electro-magnet for the purpose consists of a few turns of copper (insulated) wire in the form of a ring or helix. If such a magnetic ring be connected in series with the lamp—that is to say, arranged so that the current which passes across the arc must also flow through the coil—it will be found to exert a decided influence upon the arc.

In conducting this experiment I first placed the helix *behind* the carbon points, naturally thinking that the flame would be repelled, just as in the case of direct current; but not so. The craters soon became tilted away from one another, as I had hoped, but not in the front, that is to say, nearest to the condenser and farthest away from the helix. The flame of the arc seemed to be blown by some invisible agency towards the left-hand side of the lantern, and, in this direction, of course, the greatest amount of light was directed. When the magnetic ring was placed in front, between the condenser and the light, all the action took place at the right-hand side, which, it will be seen, was in precisely the same position relatively to the helix; so, obviously, the next thing to try was to place the coil on the left-hand side, so that, by logical deduction, the tilting of the craters should be directed towards the front.

And that is just what did occur, with the result of very greatly improving the even illumination of the disc. However, it must not be taken as a rule that a helix through which the current flows, placed at the left-hand side of the arc, will invariably blow it out in front, for, on another occasion, when I tried that experiment, a precisely different result was arrived at, and all the light was emitted at the back. The coil was then placed on the opposite side, *i.e.*, to the right of the carbons, and the desired effect was thus obtained.

I do not pretend to understand the reason of these things; I merely throw out the hint in order that those who are unfortunately obliged to content themselves with the alternating current may experiment in what certainly seems to be a very hopeful direction towards removing some of its disadvantages.

A few other peculiarities of the alternate current have to be noticed. Of course, the carbons burn away at an equal rate, for each receives precisely the same treatment from the electric current. There is no polarity. For this reason also, either lead may be connected to either terminal of the lamp indiscriminately. It will be found that the carbons consume more rapidly than is the case where continuous current is concerned; therefore, unless there be considerable available length of feed, rods of greater diameter than those used for continuous current must be employed. For instance, the 10 mm. solid and 13 mm. scored carbons, such as are suitable for continuous current of about 14 or 15 ampères, should be replaced by two 13 mm. cored carbons, where the same quantity of alternating current is to be used.

The shock from electricity of the alternating persuasion is very much greater than that given by continuous current of the same voltage. And here I should like to correct a common misconception with regard to the strength of the shock which may be received from an electric light circuit. There are people who are positively afraid to use electricity for lantern work for fear they should accidentally receive a shock. Such a fear has arisen in the first place, I suppose, on account of the rumours of terrible accidents which occasionally reach us from America. In that land of milk and honey a current of very high voltage is sometimes employed, with a large number of lamps arranged in series. A shock from such a current would undoubtedly be a serious matter. But these conditions do not exist in England—at least not for ordinary mortals—for, if, for the sake of economy, the high-tension distribution system be employed, the electricity is always reduced to a reasonable pressure — usually 100 volts — before it is allowed to enter any building. The shock from a 100 volt alternating circuit is not strong enough to be even really unpleasant, though it is a little startling when it comes unexpectedly, and the continuous current is much weaker still, so the lanternist need have no fear of summary electrocution.

The majority of automatic arc lamps will not work with an alternating current, but regulators may be obtained which are constructed specially. It is necessary, moreover, not only that a differently constructed lamp be used with the alternating current, but it must be specially modified to suit the periodicity of the current, that is to say, the number of alternations per second.

So it will be seen that even if automatic lamps be preferable where the continuous current is concerned—and their superiority in this connexion is very questionable—their use upon an alternating circuit is practically out of the question.

Artificial resistances, or rheostats, which are suitable for continuous current, will be found to answer their purpose just as well upon an alternate current of similar voltage, except that they will probably develop considerably more heat; but, where the quantity of current consumed is a desideratum, a far more satisfactory, because more economical, method of reducing the voltage is by means of a "choking coil." This instrument consists of a number of turns of insulated copper wire, wound upon an iron core, and it has the effect of "choking back" part of the electricity, instead of absorbing it and converting it into heat, as do the ordinary resistance coils.

The characteristic and disagreeable singing noise of the alternating arc may be considerably reduced in intensity by paying careful attention to the insulation of the lamp, as regards sound, from all portions of the lantern which might act as sounding boards. For instance, a sheet of indiarubber might, with advantage, be laid under the base of the lamp, and rubber blocks, placed under each corner of the lantern, would prevent the vibrations being trans-

mitted to the table. Wads of soft asbestos wool, stuffed between the woodwork of the lantern and its metallic lining, would materially deaden the sound, while attention might well be directed towards the closing up of unnecessary openings in the lantern body; and it must be remembered, in this connexion, that air is not required for consumption by the arc light. There is no combustion, in the true sense of the word, to need atmospheric support.

Summarising, then, the conditions under which a lanternist must work in those cases where only alternating electricity is at his disposal, it must be remembered that only cored carbons of equal thickness should be used, and they must be full large, either in diameter or length, to compensate for their increased rate of consumption. That the lamp must either be tilted back 25° or 30°, in order to throw the "shadow belt" outside the range of the condenser, or, better still, the arc should, by magnetic influence, be induced to play only at the front side of the carbons, so that the two craters are tilted up towards the lenses, and that great attention must be paid to sound insulation, in order that the irrepressible "singing" of the arc may be reduced as much as possible. CECIL M. HEPWORTH.

LANTERN-SLIDE MAKING.

AT the Meeting of the Hackney Photographic Society, on October 22, Mr. W. Rawlings presiding, Mr. J. O. Grant gave a lecture and demonstration on *Lantern-slide Making*. He said that there were two methods of printing—by contact and through the camera. It had been often said that camera printing was the superior method, and that slides made that way were easily to be distinguished from those produced by contact. This he doubted, and believed that there was very little difference between perfect slides made by either process. Personally, he always worked by the contact method, and proposed to confine his remarks principally to that during the evening.

The great point to observe in lantern-slide work was to have a fixed standard for every detail of the process, otherwise uniformity of result could not be obtained. For instance, the light should be constant and regular, and one make of plate and developer should be used. With regard to the plate, there was no *best* kind, but there were plenty of good brands to select from. The worker should choose one and stick to it, and use a constant developer, the one recommended by the maker of the plate for preference. As regards the illuminant, the speaker recommended artificial light to be used, it being more constant than daylight. The incandescent gaslight was a good thing, and shortened exposure considerably as compared with the ordinary gas or oil light. For contact work a printing frame should be used which would allow a large negative being adjusted in any position, so that any portion might be selected. For the purpose of exposure, a graduated scale of distances should be marked off from the light, so that the correct distance might be assured. It must be remembered that, theoretically, the light decreased in power as the square of the distance from the source, and exposure made accordingly. This would have to be modified slightly in practice, for it would be found that, given theoretically correct approximate exposures, ess contrast would be obtained on a plate exposed near to the light than on one exposed farther away. This difference, however, might be utilised in dealing with strong and weak negatives respectively; the dense ones could be exposed closer to the light than the thin.

The necessary time for exposure must be determined by experiment. It was well to keep by, for reference, with exposure, development, &c., data attached, several good slides which had passed the lantern test. Supposing that the negative about to be used was about equal to the negative of one of the test slides, then the necessary exposure would be known, providing, however, that the light, make of plate, developer, &c., were the same. This was an example of the desirability of sticking to one set of materials. If the negative about to be used were different to others, and there were no data to go by, then a test plate should be exposed in strips, with varying exposures, and developed; the correct exposure necessary could be then ascertained by examining the sections. One plate exposed in this way was not wasted, and it would save many which would be wasted if a more hap-hazard method were used.

It was somewhat difficult to judge as to when sufficient density had been obtained in development. Plates of different kinds varied very much in this respect, and also when different developers were used. This knowledge could only be obtained by practice and by keeping to one plate and developer. As regards intensification, reduction, &c., the speaker did not approve of any after-treatment of the slide. It was far better, if a good slide was not produced at first, to make another, than to waste time in trying to improve the first.

After treating of other matters in connexion with the subject, Mr. Grant brought his remarks to a conclusion by demonstrating the method of contact printing.

In the discussion which followed the Chairman said that he did not agree with Mr. Grant as regards the equality of contact printing and the camera method. He thought that reduction was superior for several reasons. In some cases, when the glass of the negative or lantern plate was not flat, perfect contact could not be obtained, and so fine detail would be lost. Reduction also gave all the details on a larger plate crowded into a smaller space, the detail and grain of the resulting slide being necessarily finer. It also gave a better-shaped picture—oblong instead of square. Mr. Grant had deprecated intensifying, but he (the Chairman) had found that a very fine warm-toned slide might be made out of one too thin by intensifying with mercury and ammonia.

Mr. R. Beckett agreed with the last speaker as regards the advantage of reduction over contact. Referring to the illuminant, he remarked that it would be found, when using gas, that the difference of pressure in daytime and at night would have to be taken into account.

In reply to Mr. Gosling, *re* the incandescent gaslight, Mr. Grant said that, when enlarging by it on bromide paper, he found the necessary exposure by it to be twenty or thirty seconds, as compared with about half an hour when using a duplex paraffin light.

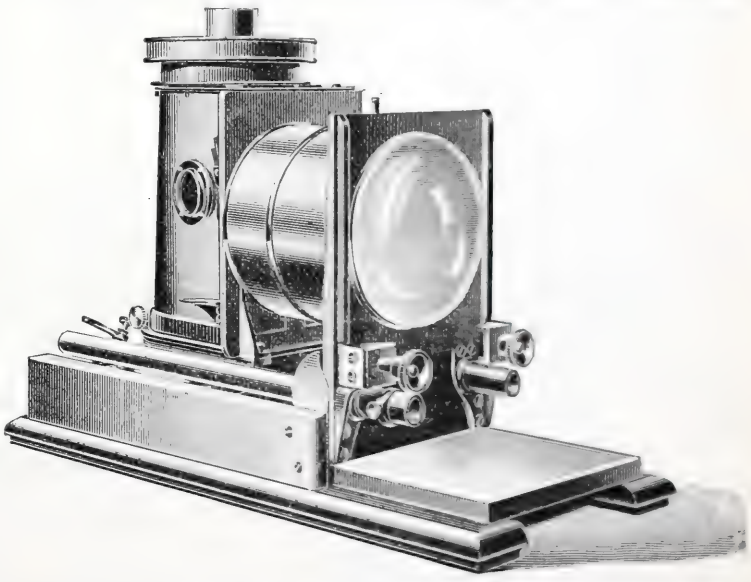
In conclusion, as regards contact printing *versus* reduction, he found the former method sufficiently good to gain awards at exhibition competitions, and that was sufficient for him.

The Manchester Photographic Society's first Lantern Meeting of the season was held at the Society's rooms in George-street on the 23rd instant, Mr. H. M. Whitefield presiding. The subject of the evening was a general summary of lantern-slide making, and was introduced by Mr. W. Tomlinson, who mentioned the chief operations necessary for the production of perfect transparencies, from dusting the plate to the finished slide and its subsequent exhibition in the lantern. The members then gave their opinions, and the result of the meeting was that the negative most suitable for transparency work is one rather thin, full of detail in the shadows, with no harsh lights. Contact and reduction were next treated of. Copying in the camera was found theoretically to be better than contact, although giving little appreciable difference in results. Each brand of plates found its own individual supporters, and, in the matter of development, much also is left to the operator, some being most successful with pyro, others hydroquinone, metol, ferrous oxalate, eikonogen, &c. In the interchange of opinions, Messrs. W. G. Coote, S. L. Coulthurst, A. Haywood, jun., H. V. Lawes, E. H. Turner, and J. Wood gave their various methods. There was then an exhibition of slides by Messrs. Coote, Coulthurst, Lawes, and Turner, Mr. Whittaker manipulating the lantern.

A NEW FORM OF LANTERN.

MESSRS. Ross & Co., of 111, New Bond-street, are about to introduce a form of lantern which possesses many new and useful features, in fact it will be found to be so novel, not only in appearance but also in its details of construction generally, that very little remains to remind one of the old styles with which everybody has become familiar.

The time-honoured wooden body, with its "panelled doors," "moulded



foot," &c., has entirely gone, and in its place there is a neat body of black metal, having sight holes, but no doors, the reason of the absence of doors being that this metal body can in a moment, when desired, be raised several inches from its base, disclosing that portion of the jet which carries the lime, and leaving it entirely free for fixing and adjusting, after which the "body" can, with equal facility, be lowered into its original position. It should be mentioned that the jet taps and lime turner are conveniently placed on the base frame outside this rising body.

The ventilation of the instrument appears to be very thorough; the small funnel, seen in the illustration, carries off the direct heat from the jet, while the bulk of the radiated heat escapes round a disc which is fixed in the ring portion at the top of the body; there is also a third source of exit for such of the heated air as would otherwise lodge in and around the

top corners; by thus providing such ample ventilation, a comparatively small body or hood can be employed without being attended with undue heating.

A special feature of this lantern is that it carries two condensers, viz., a 5½-inch "double," and a 4½-inch "triple," and either of these can be used and changed about as desired with great facility.

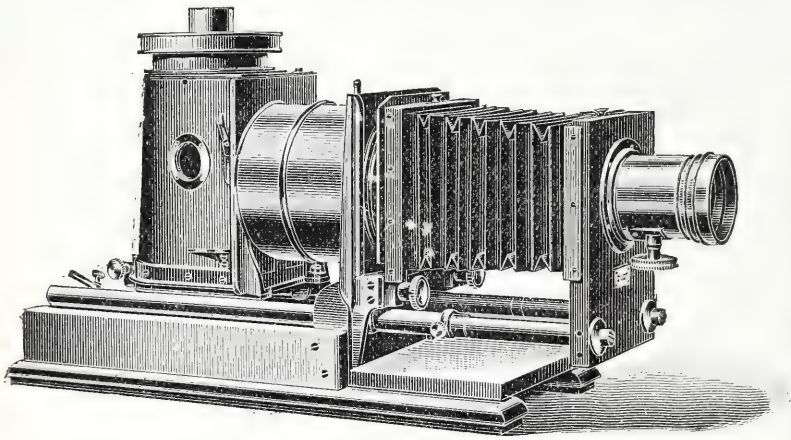
With the 5½-inch one can project transparencies of either the ordinary lantern or quarter-plate size, or can enlarge from quarter-plate negatives, or from portions of large plates; it is also adapted for science work, as the light can be obtained either in parallel beams or convergent or divergent at will.

The stage is entirely open on three sides; the bellows can be detached in a moment, or the whole front can be entirely removed in a couple of seconds.

The triple condenser is used where it is important to obtain the maximum of light for the projection of slides of the standard size.

As the lantern is equally as well designed for enlarging as for ordinary projection, it will be understood that the arrangements for trapping the light have been properly attended to.

Although the instrument carries so large a condenser, its dimensions are, in some respects, within the limits of other instruments carrying only



the ordinary 4-inch, and this result is obtained by the use of metal in the construction of all the working parts, only the base and front being of wood; this system of construction appears to have several advantages, for, besides being more compact, the instrument works with great certainty and smoothness, and may be relied upon to continue thus satisfactorily, there being no wood which can warp or twist with the heat, yet the advantage and convenience of the wooden base are retained.

The chief *raison-d'être* of this instrument, however, is undoubtedly the exceptionally wide ranges of uses to which it can be put, and the ease and perfection with which it accomplishes its work in each department.

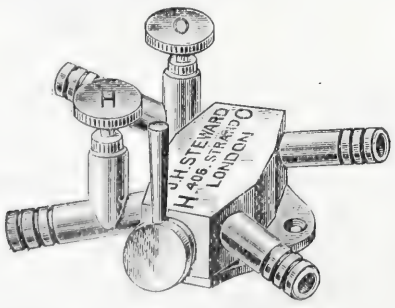
Any form of limelight can be used, but arrangements are being made whereby it will be fitted with the new form of jet, and while only one cylinder of gas is required, yet the light is fully equal to the best "mixed" jets; it is intended also to be fitted with a suitable arc lamp.

It only remains for us to add that the instrument is well and beautifully made in all its parts, and works with machine-like precision. The variety of uses to which it is susceptible of being put well justifies its being called "Universal," and we do not doubt, therefore, that it will be highly appreciated by the ever-increasing number of photographers, scientists, lecturers, and entertainers, to whom ease and facility of lantern projection are of importance.

NEW COMBINED "CUT-OFF" AND FINE ADJUSTMENT VALVE.

J. H. Steward, 406, Strand, London.

The value of a "cut-off" for limelight jets has long since been recognised, for after once the light has been adjusted to the required height it can be turned down to a bead and left for any length of time, to be



turned up in an instant to its original height by simply moving the lever up and down. The addition of screw-down valves to this neat apparatus makes the fine adjustment of the light a certainty. It should be specially useful in microscopic and other projections for enlargements with any jet not provided with these special fittings.

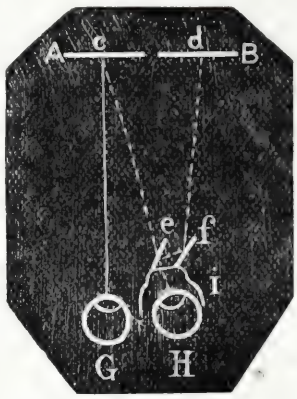
BROWN'S POCKET STEREOSCOPE.

Theodore Brown, Portland House, Salisbury.

This Pocket Stereoscope consists of a small tube at the end of which are mounted obliquely, with their faces to each other, two small mirrors.



For examining ordinary stereoscopic views the Stereoscope is taken between the thumb and forefinger, with the mirrors pointing to the picture, leaning from the left to the right, and square with the views to be examined. It is then placed to the right eye. This will be more clearly understood by referring to the diagram below, wherein the views are supposed to be situated at A and B, the stereoscope at I, and the eyes of the observer at g and h. The left eye, g, looks direct to the point c in the left-hand view, A, and, although the right eye, h, is looking in the same direction, to the point c, it sees a different but corresponding point, d, in the other view, B, by reflection from d to f, f to e, and from e to c, thus enabling both eyes to look in their natural direction, but each to see a different view of one object at the same point, c, where they are blended together and produce stereoscopic relief.

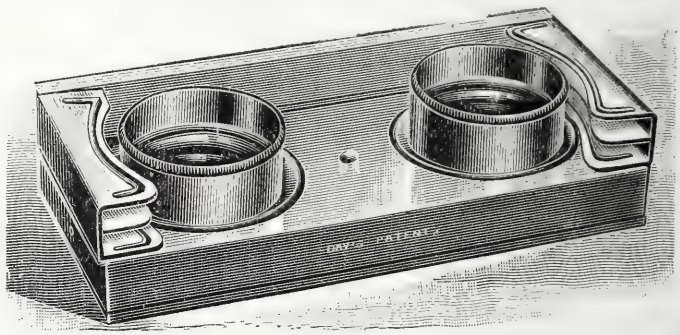


We have put the Pocket Stereoscope to use in the examination of some stereoscopic slides, and find that it gives perfect stereoscopic effect.

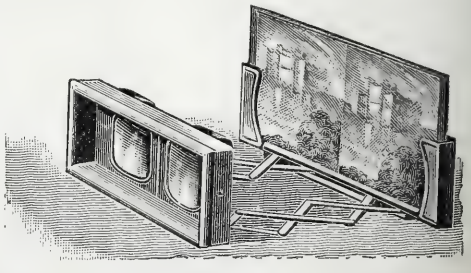
DAY'S PORTABLE STEREOSCOPE.

J. Day, Scout Hill View, Dewsbury.

Since last we noticed the neat and handy little Stereoscope of Mr. Day one or two minor improvements have been added to it which are well



calculated to increase its utility. A specimen recently submitted to us is not only fitted, as all stereoscopes should be, with achromatic eyepieces, but these latter admit of adjustment in a lateral direction, a great convenience when it is remembered that the distance of separation of the eyes varies with the individual. Another point of improvement is to be noted with regard to the holder for the stereograph, which takes either slides or transparencies of various widths.



Day's Stereoscope is a compact, beautifully made and finished little article, which should be popular among stereoscopic workers. The illustrations convey a good idea of its form when opened or closed.

MONTHLY SUPPLEMENT

To the "British Journal of Photography."] [*December 6, 1895.*

THE LANTERN RECORD.

CONTENTS.

	Page
NOTES AND NEWS	89
LANTERN MEMS. By G. R. BAKER	90
THE PERCEPTION OF LIGHT	90
AN IMPROVED LANTERN AND BOX	92
THE ANAGLYPH AND HOW IT IS MADE. By A. F. WATCH	93
IMPROVEMENTS IN KINETOSCOPES	93
ACETYLENE GAS	94
NEWTON'S "UNIVERSAL" ELECTRIC HAND-FEED ARC LAMP	94
A METHOD OF STEREOSCOPIC PROJECTION. By E. W. SCRIPTURE	94
THE ASTRONOMICAL CAMERA AT THE SYDNEY OBSERVATORY	95
FLASHLIGHT WONDERS	96

NOTES AND NEWS.

Mr. Charles Reid, of Wishaw, N.B., who for years has successfully made animal portraiture the subject of special attention, sends us a reading descriptive of eighty-four lantern slides of "Animals You Know." The "book" is very well written, and, unlike many lantern-lecture books, is one that both old and young can listen to without its being thought too elementary by the one or too "advanced" by the other.

* * * * *

According to a contemporary, the following figures show the great power of some modern lighthouse apparatus in use in the Trinity House and Northern Lighthouse Services:—The Isle of May light (Firth of Forth) has a calculated intensity of no less than 26,000,000 candles to each flash, while the St. Catherine's (Isle of Wight) electric light, calculated on the same basis, has a strength of beam equal to 5,000,000 candles. The power of the La Heve electric light is stated at 23,000,000 candles. Turning now to the ordinary lights, where paraffin oil is the illuminant, the following may be mentioned as being of very great power:—The Bishop Rock (Scilly), biform, with two eight-wick burners, and hyper-radiant apparatus, gives a flash of 175,000 candles. The Eddystone, with two six-wick burners and first order apparatus, gives a flash of 75,000 candles. Sule Skerry, with one six-wick burner and hyper-radiant apparatus gives a flash of 74,000 candles, and Fair Isle North (Sumburgh Head), one six-wick burner and hyper-radiant apparatus, without upper and lower prisms, gives a flash of 72,000 candle power.

* * * * *

Messrs. F. S. Thorn & Co., of 169, Camberwell New-road, S.E., are introducing a system of photography by gaslight termed the "Incanto." It is described in the following terms:—The apparatus is in the form of a tree, the branches holding incandescent gaslights, reflected and shaded to prevent deep shadows, and directing the light, which is upwards of 700 candle power, full upon the subject, without in any way interfering with the eyes to the detriment of the picture. The whole apparatus is complete in itself, occupies very limited space, and can easily be moved to any position in the studio without detaching any part or even lowering the light. The gas is controlled by a special bypass stop-cock, permitting the lamps to be kept in readiness, so that when actually required it can be turned full on by means of one lever instantly, the cost of gas for each sitting being less than one penny. The apparatus may be conveniently taken to places of entertainment, such as fancy dress balls, bazaars, &c., and attached to any ordinary gas fittings by means of flexible gas tubing. The firm invite photographers to call and see the invention as fitted in a studio, and also to make test negatives.

* * * * *

Mr. Henry Charles White, of North Bennington, in the State of Vermont, United States of America, has patented some "Improvements in Stereoscopes." He says: "As heretofore generally made, the hood of a hand stereoscope has fitted only the upper part of the face, leaving the space below the plane of the eyes open and thereby admitting light, which more or less interferes with perfect vision in using the stereoscope. The principal object of this invention is to remedy the above defect, and create a practical camera obscura between the face of the observer and the lens frame. I also secure greater cheapness in construction by my improvements." Mr. White achieves the end aimed at by making the hood of the stereoscope of such a shape as to fit the face of the observer. It is a very good idea, although possibly it is largely immaterial, in viewing binocular photographs through a stereoscope of the Holmes pattern, whether side light passes through the eyepieces or not. Then, again, Mr. White seems to overlook the fact that faces, like opinions, differ.

* * * * *

Yet another patent relating to the stereoscope and its improvement for advertising purposes and public use. M. R. Harilaos, of Paris, is the author of the invention, and it "relates to an improved construction of stereoscopes for advertising purposes, and for public use in such places of public resort as restaurants, hotels, cabs, railway carriages, and the like. In the improved stereoscopes there is employed a series of views and advertisements successively arranged upon endless bands or films, mounted upon two or more rollers or upon continuous bands or films, each of which is wound alternately upon one or the other of two rollers. In the case of the endless band, a single handle suffices to operate the apparatus. In the other case, two such handles may be employed. But, it having been found in practice that the use of two handles is inconvenient, there has been designed a stereoscope with a continuous band operated by a single handle."

* * * * *

Mr. W. Hume, of Lothian-street, Edinburgh, sends us a copy of his lantern catalogue. Among other new things, two oxygen generators are illustrated and referred to.

* * * * *

Arc lamps form a prominent feature of the lantern catalogue of Messrs. Newton & Co., of 3, Fleet-street, six or seven patterns being described. In other respects the catalogue is well abreast of the times.

* * * * *

Messrs. Newton & Co. have sent some coloured portraits of the Queen to the Bechuana Chiefs, King Khama and the others, through the Colonial Office.

LANTERN MEMS.

As a lanternist, I feel I must place on record my sincere regret at the loss the lantern and photographic world has sustained by the sudden death of the late Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, for not only was his unique knowledge of optical matters in connexion with photography and projection always at the service of those requiring information, but the geniality of his disposition was such that the usual awe-inspiring "We" of the Editorial had no existence when once the sanctum in York-street was entered, for one found oneself face to face with a friend, and therefore at once at ease.

* * * * *

I HAVE had the advantage of the friendship of the late Mr. Traill Taylor for over twenty years, and there must be hundreds like myself who have been brought in contact with him both in connexion with lantern and photographic literature and at the technical societies who would like to see some permanent record made of his services, and the suggestion to place a bust in the Royal Photographic Society's room is an excellent one, and would, I feel sure, be a fitting tribute, and would also show the relations of the deceased that the services of our late Editor are not forgotten, besides being a practical expression of the sympathy of the photographic community with them in their bereavement.

* * * * *

THE persistency with which the late Editor advocated the use of triple condensers for optical lanterns stands out prominently when I reflect on his ideas as expressed to me in connexion with lantern matters; and, although for years their use was very limited, they have during the last few years been somewhat extensively employed, especially for projection microscopes and special science lanterns. Another pet fancy was for the oxycalcium spirit jet, but, owing to the introduction of compressed hydrogen and oxygen and the advent of saturators, very little call in a commercial way was made upon spirit jets. No doubt, however, with certain modifications, a great deal more light could be obtained from the oxy calcium jet if the form was altered and the risk of overflow was neutralised. I should not be surprised to find that some day this light was again popular for small audiences, and in country places where gas is not obtainable.

* * * * *

UP to the time of writing, nothing definite is known respecting the report of the Committee on Compressed Gases and Cylinders, and it is probable that, as another meeting has to take place before anything is published, it will be the middle of this month before the long-looked-for information is available for lanternists. It is, however, so far gratifying to learn, from rumours "in the air," that the restrictions on its use and conveyance will not be very serious, and all interested will be glad to know that some of the railway companies are already relaxing, if not disregarding, some of their own illogical regulations, and assisting in the distribution of the compressed gas in a sensible and practical manner.

* * * * *

ONE reads of limelight jet trials and wonderful results obtained in the way of power of light when a practically unlimited amount of gas is used, and I learn that the consumption of gas at the meeting was at the rate of ten feet of each gas per hour. I, unfortunately, had a prior engagement on the evening of the trial at the Photographic Club, not having had a special mem. of the date, or I should have gone. One thing is quite certain, from my experience at the Lantern Society trial, that, if jets using this large quantity of gas are employed regularly, the existing type of lantern body will have to be cast aside, and something that will not smoulder and catch fire substituted for it. Extra care will also have to be taken of slides so that they do not suffer from the extra heat.

* * * * *

WITH practically an unlimited pressure of gas from cylinders, and a large mixing box to the jets, also given a well-constructed nozzle with smooth bore, the light can be anything desired from 500 to 1200 candle power; the same as, with the electric light, the power can be increased to almost any extent by increasing the amount of current, and using a suitable lamp and resistance. To say that the limelight is more powerful than the electric light for lantern purposes is only expressing the result of a comparison under conditions "as found," but not as calculated to give the maximum light. I have personally assisted with a projection with the electric light where the illuminant gave at least 2000 candle power.

* * * * *

As the heat generated with this power of light is such as to be anything but comfortable to the operator, I imagine that, except for special purposes, anything over 800 candle power will seldom be wanted for projection; and, even with the lantern microscope, it is a moot question whether the large area of light produced by the higher power mentioned (with the limelight) will be found so suitable for definition as the moderate power. Certain it is that, where current is available, the electric arc light is simply perfect for microscopic projections.

* * * * *

IF what one learns is correct, the indestructible mantle for incandescent gas lamps is not only an accomplished fact, but is being placed on the market, and, if it permits of higher pressure of gas being used and a more brilliant light by that or other means being obtained, it will be an excellent light for lanternists. The present form of incandescent gas lamp is useful for small discs, but, like most lights having a large area of illumination, it does not give ideal definition on the screen.

G. R. BAKER.

THE PERCEPTION OF LIGHT.

[Nature.]

[Presidential Address delivered at the Victoria Institute by Sir G. G. Stokes, F.R.S.

AT a former anniversary I brought before the members of the Institute the subject of the luminiferous ether. It is one of great and growing interest. I mentioned on that occasion how discoveries of very recent date have led us to attribute continually increasing importance and a widening range of function to that medium—substance can I call it?—the existence of which was originally assumed as an hypothesis in order to account for the phenomena of light. It is in connexion with this last aspect that it relates to what I propose to bring before you to-day.

The wonderful sense of sight, which, to use an expression of Sir John Herschel's, confers upon us to some extent the character of ubiquity, requires two things: in the first place, some means by which those distant bodies which we see are able to affect our own neighbourhood; in the second place, some provision in our own bodies for receiving that influence, and transmitting some sensation to the conscious being.

In my former address I considered the first of these two subjects; to-day I mean to confine myself to the second. This second, even by itself, is, however, far too wide for a single address; selection of some kind is imperatively demanded. Moreover, there are some parts which are accurately known, and may even be made the object of mathematical calculation, while there are others which not merely lie beyond our existing knowledge, but beyond any that we can hope to attain to, at least in this life. Wonderful as is the construction of the eye in all its parts, so far as relates to the formation of images on the retina, it acts simply like an optical instrument, like a telescope or microscope, or, more correctly, like the objective of such an instrument, and we may apply our mathematics to tracing the course of the rays through it. On the other hand, even if we knew accurately—which we do not—the nature of the effect which the external agent produces on the ultimate structure of our bodies, there would still remain, shrouded in impenetrable mystery, the nature of the process by which some change in the bodily organism causes a sensation to the conscious being.

Between those two extremes lies a region which has been to some extent explored, and in which a gradual and perhaps at last a very substantial increase to our existing scientific knowledge may be looked upon as probable. The investigation of this region possesses the keen interest which belongs to the discovery of new truths, and the addition thereby made to the stock of human knowledge. It is to this borderland lying between the well-known and the unknown, and to certain parts of the structure of the eye having relation to it, that I would for a short time direct your attention to-day.

As I have already intimated, I propose to pass by entirely the functions of the eye acting as a simple optical instrument in forming images on the retina. The explanation of that may be found in all the ordinary text-books, and I will not weary you by repeating what is there to be found, and which is generally familiarly known.

The phenomena of vision show that distinctness of vision is dependent somehow or other, in the first instance, on the formation of distinct images of external objects on the retina. In that formation, as I have said, the transparent portion of the eye—the cornea, the aqueous humour, the crystalline lens and vitreous humour—plays the part of a lens in an

optical instrument. I have said the "formation of the images on the retina;" but the retina is not a mere surface, it has a certain amount of thickness, although it is, on the whole, very thin. We may further inquire on what part of the retina, considered at different depths from the place where it first commences, on which of the various layers into which histologists have divided it, is it that we have reason to think that light first acts on the organism of our bodies in such a manner as ultimately to give us the sensation of vision?

I have said that the retina, as a whole, though very thin, is not a mere surface. If we go from the centre of the eyeball outwards, *i.e.*, towards the back of the body, we have first a plexus of very fine nerve fibres, which run along the front of the retina, and ultimately unite in the optic nerve, which runs into the brain. We have also minute blood vessels, which are essential, apparently, for the growth from its original state, and for the nutrition of the eyeball, and for the carrying on of the process for which it was designed, viz., that of enabling us to see. Then we have several layers of pulpy transparent substances which have been called ganglions, nuclei, and molecules, mixed with very fine fibres. Some of these are nerve fibres, others are believed by anatomists to have relation to the fixing of the various parts of the structure to one another, so that they shall not fall to pieces in the rapid motions of the person using the eye.

Outside all, at the back surface of the retina, there is what is called the choroid coat; but between that and the coats I have spoken of is a very remarkable structure which I shall have to say more about. It is called the *bacillary* layer. In this part of the retina we have a vast number of elongated bodies placed closely, side by side. In the human eye, and in the eyes of most animals, they are of two shapes, and have been called accordingly rods and cones. The rods, as the name implies, are cylindrical, and the cones are tapering and are somewhat of the shape of slender peg tops, the sharp side being turned inwards as regards the way you look, so that the light, in coming from the outside, first meets the bases of the peg-tops, and then goes on towards the point. About the point of these rods and cones, just close to the choroid coat, is a layer of pigment cells which absorb the greater part of the light falling upon them. The rods and cones are transparent, and allow the light to pass through them, passing lengthways. I said the extremities reached to the layer of pigment cells forming a black lining immediately inside the choroid coat. That is true of the rods, but the cones do not reach quite so far, *i.e.* when the eye is in a state of repose, as in darkness; but under the stimulus of light these pigment cells come down, *i.e.* forward, in the direction in which you look, so as to reach the tops of the cones as well as of the rods. I have said that these elements (remember, please, that they point radially in the direction in which you are looking, and lie side by side) are exceedingly numerous. When they are looked on lengthways from the back of the eye, when the pigment is removed, they form a sort of mosaic. You may imagine the general structure of them by thinking of the head of the common sunflower in seed. They are arranged side by side, something like the seeds of the sunflower; but they lie so close that the distance between the neighbouring rods or cones, as the case may be, is only about (it varies somewhat from one part of the eye to another) $\frac{1}{1000}$ part of a millimetre, or say about $\frac{1}{6000}$ part of an inch. So numerous are they that a square with sides the tenth of an inch would cover nearly half a million of them.

Now, something more about these rods and cones. They are found to be composed of two members or limbs, an inner (nearer the centre of the eyeball) and an outer. The inner is a transparent-looking body, very much like the other bodies in the neighbourhood. The outer is transparent too; but it is found to be highly refractive. It is longer in the rods than in the cones. The outer segment of the cones may be represented to the mind's eye by thinking of the metallic point of a peg top. These outer limbs are in both cases readily detached (when the eye is dissected) from the inner, and they separate after a little into laminæ, lying one on the top of the other, perpendicular to the axis of the rod or cone. At the outer end they do not appear to have any continuation, the structure stops. At the inner end (corresponding in the case of the cones with the bulbs of the peg tops) there come nerve fibres from each of them. These pass through the various layers that I have spoken of; and, although the cause of them has not actually been traced the whole way, on account of the difficulty of examination of this pulpy structure, it is pretty certain that they join on to those nerve fibres which line the front surface of the retina, and so pass on, through the optic nerve, to the brain. When I say "pass on," I mean, of course, as you trace them along; there is no motion in the case. This is a very remarkable structure. Has it any object? What is its object? Now, we know by experience that, if we have a single point of light exposed to us, the impression is that of a single point of light in the field of view. If there be two such points, we have the impression of two luminous points occupying different positions in the field of view. Now, two such points may be very close to one another, and yet we still see them as two. It is found that the limit of closeness, beyond which we are unable to distinguish two objects as two, is such that a line drawn between them subtends at the eye an angle of about one minute, or an angle of about $\frac{1}{3000}$ part of that subtended by the diameter of the moon. Yet, although they exist as close as that, the impression of the two is distinct, and we might have a number of points, each giving a distinct impression. It appears, therefore, that for the purpose of vision it is necessary that stimulations coming from a vast number of independent points, having different bearings from the eye, should, somehow or other, give rise to distinct impressions.

Now, if by calculation we trace inwards, to the retina, the course of the axes of two pencils coming respectively from two distant points not far from the centre of the field, it is found that those axes intersect, not exactly in the centre of the eyeball, but in a point (called the optical centre) a little in front of it, the position of which we can calculate; and the place of either image may be found by joining the external point with the optical centre, and producing the joining line to meet the retina. It is an easy matter now to calculate the distance on the retina of the images of two external points which subtend at the eye a known angle; and it is found that, when the external points are so close as only just to be seen as two, the distance of the two images is about the $\frac{1}{1000}$ of a millimetre, just about the distance apart of the cones and rods from one another, lying so closely as I have explained they do. Here, then, it would appear, in this remarkable layer of the retina, we have a provision enabling us to have distinct sensation of a vast number of distinct points in the field of view; and consequently we have reason to suppose that the effect of light, whatever it be, on one of these elements (be it cone or be it rod) gives rise to the sensation of a point; and that the position of that point in the field of view depends upon the position of the element of the bacillary layer which has been affected by the light coming from the point. Moreover, in the nerve fibres which come from the anterior ends of the rods and cones, we appear to have a provision for communicating, through the optic nerve, to the brain, the influence, or an indication of the influence, which light exerts on one of these elements.

Now, I have mentioned one argument for believing that this remarkable bacillary layer is that in which light, which previously merely passed through the eye as it would through an optical instrument, acts in some manner on the organism so as to give rise to stimulation of the nerves which convey to us the sensation of vision. The argument, so far, is a sort of *à priori* one, but it has been remarkably confirmed by an experiment of H. Müller's, made by means of Purkinje's figures.

When in a room which is not quite dark we look with one eye towards a moderately illuminated wall with uniform surface, and holding a candle to one side of the eye move it up and down, there is seen in the field of view a figure branching like seaweed. This is the shadow of the blood vessels of the retina. That the candle requires to be moved in order to show the figure is explained by the consideration that the shadow is not black, but only darker than its neighbourhood, and when the light is steady the exhaustion of the eye for that part of the field which lies beside the shadow tends to equalise the apparent illumination of the parts in and out of shadow; whereas, when the candle is moved, the shadow falls on a new place which had been in full light and therefore partially exhausted, and the previous exhaustion and the new partial interception of light falling on that place contribute to make the shadow sensible.

The existence of a shadow shows already that the percipient layer of the retina must lie behind the blood vessels. But we may go a step further. By suitable methods of illumination we may cause two spots on the surface of the eyeball, whose positions can be determined from the circumstances of the experiment, to be alternately virtually the sources of the light which casts the shadow, and the places in the field of view of the shadows of the same vessel in the two positions of the illuminating source can be marked. It is then only a question of similar triangles to determine how far behind the blood vessels lies the percipient layer, and the distance thus calculated is found to agree, within the limits of errors of observation, with the distance of the bacillary layer as determined by microscopic examination of a dissected eye.

I have said, as you go backward from the centre of the eyeball, you have, in front of the rest of the retina, a plexus, as it is called, of nerve fibres lying side by side, something like the threads in a skein of silk, but gradually leading onwards to the optic nerve. Light passes across these, but it does not excite the nerves in passing through them. The nerves are transparent, and the light produces no effect upon them directly. If it did, your whole field of view would be confused, because it is known that, when a nerve is excited, the sensation is referred to a particular part, no matter where the nerve may be affected. Suppose you could isolate, say in the thigh, a particular nerve leading to the great toe, and pinch it without hurting its neighbours, you would feel the pinch, not where the nerve is pinched, but in the great toe. So, here, if these nerve fibres were excited by the passage of light through them, then the sensation corresponding to the excitement of a particular nerve fibre, which would be that of a definite point in the field of view, would be excited by an external luminous point lying anywhere in the curve in which the surface generated by a straight line passing through the optical centre and intersecting the fibre in question would cut what we may call the celestial sphere, and the correspondence between the subjective points in the field of view and objective external points would be lost. And the fact that the visual nerves are not affected by light which passes across them is further shown by the well-known experiment of the blind spot, where the optic axis passes out of the eyeball, not in the axis of vision but to one side, towards the nose, so that an object whose image falls on the blind spot of one eye is seen by means of the other.

But now comes a question, and here we enter on uncertain and debated ground, How is it that the nerves are stimulated by the light at all?

We have reason to believe that these rods and cones form the means by which the light, acting on them, causes the stimulation of the nerve. As I have said, they consist of two elements, an inner and outer; the outer from the centre of the eye, *i.e.*, the inner as regards the body, being of that remarkable structure which I have described. It has been questioned which of these two elements it is that you are to regard as the percipient organ. I do not know that physiologists have decided that question. I have looked into a paper of Max Schultze's—in fact, I have it on the table—and he inclines to the opinion that it is the outer element. Now, is there anything in the outer element which can conceivably form a means of stimulation of the nerve, when that element is acted on by light?

I have spoken of the way in which it is composed of laminæ which come to pieces when dissected, after a certain amount of maceration. I do not know whether it may not be rash to say what I am about to say, because I do not know that physiologists have suggested it—it is merely an idea which occurred to myself, so you must take it for what it is worth. I was reading an account of the electric organ of electrical fishes, such as the torpedo. It is a very remarkable organ, occupying a considerable space in these fishes. It has a columnar structure, and the column, again, consists of laminæ placed one over the other. It has a structure which may roughly be compared to that of the basaltic columns in the Giant's Causeway, only here you must think of laminæ as more numerous and not having that curved surface shown in the Giant's Causeway. Now, nobody questions that somehow or other this is an organ by means of which these fishes are enabled to give a shock, and the idea, of course, is suggested, Are not these laminæ like the plates of a battery? Is not one of these columns, roughly speaking, something like a galvanic battery? But how the battery is charged and discharged we do not know. In this case it depends, no doubt, on the will of the animal as to what he does, and nobody knows how he brings that about.

Now, it strikes me that there is a remarkable apparent analogy between the outer member of the rods and cones, and these columns in electrical fishes. This gives rise to the suspicion that possibly these outer members may act the part of a microscopic battery, being charged somehow or other. But how are they to be charged? Well, before I go on to enter into any speculation on that, I may mention that some years ago Prof. Dewar and Mr. McKendrick made some remarkable experiments, the results of which are given in a paper published in the *Transactions* of the Royal Society of Edinburgh. When an eye is dissected out, and the cornea is connected through a wire with non-polarising electrodes to the middle of the section of the optic nerve, the wire being led through a delicate galvanometer, it is found that there is a certain amount of electric current passing. Now, it was found that when the eye (having been in darkness) was allowed to have light shining upon it, there was a change in this current, and a change again when the light was cut off. It is true that the total change was only a small fraction of the whole; but, still, that there should be any change at all produced by the action of light is a remarkable thing. It looks very much as if the stimulation of the nerve had something or other to do with the production of electric currents; but those, if they are produced, we must suppose to be produced in some way by the action of light. How may we imagine light to act so as to produce them? It has been discovered that in the layer of pigment cells in the retina there is a substance, called visual purple, of a purple colour, which is acted on by light, and is made first yellow and then nearly colourless. We have thus a substance that is capable of being acted upon by light, as very many substances are. I do not say that it is by any means proved that that is the substance, or even that there is any substance which is acted upon by light in the way demanded; yet it seems very probable that the change produced by the action of light, whether it be on visual purple or some other substance associated with it, may give rise to something which may, so to speak, charge this microscopic battery and stimulate the nerve fibre which is attached to it. We know the rate of the vibrations of light of various kinds; and the rapidity of vibrations is so enormous, ranging about 400 millions of millions of vibrations in a second, that we can hardly imagine that the organism of our bodies is calculated to be set in vibration in a corresponding period. In that respect the sense of sight differs notably from the sense of hearing. In hearing the tympanum of the ear is thrown into vibration, and the vibrations are not so enormous in number in such a time as one second but that the corresponding nerves may actually be mechanically agitated, and thereby in some way stimulated. We can hardly imagine that the visual nerves are acted upon in this sort of way directly by the luminous vibrations, but they may be indirectly. Here, again, I may throw out a possible conjecture, though I am less disposed to receive it myself than that which I have just mentioned. We know there are substances which when acted upon by light continue to shine in the dark. In some cases the action ceases almost instantly after the exciting light is cut off; for instance, a solution of the salts of quinine, where the rapidity of cessation of the effect is amply sufficient to tally with the rapidity of cessation of visual sensation when light is cut off.

There are various other matters connected with the perception of light which are of great importance to our well-being and to our enjoyment which I have not ventured to touch upon at all. It would take a great deal too long to go into two which I will only just mention. One is the provision in the two eyes, and in the muscles which move them, which enables us to obtain a single vision notwithstanding that the two eyes are at work. Nothing is easier than to obtain double vision in which the images seen by mean of two eyes occupy different positions in the field of view. There are very remarkable contrivances for bringing about singleness of vision in the habitual use of both eyes.

Then, again, we do not see light merely as light, but we see a great variety of colour. We can distinguish one light from another light by its colour, and not by its intensity only. It would take me a great deal too long to give you any idea of what is known (which, after all, is not much) as to the way in which that is effected.

AN IMPROVED LANTERN AND BOX.

Mr. W. D. Askew, who some time ago brought out a box for carrying lanterns, thus describes further improvements he has made:—

"In my Specification to Letters Patent, No. 5174, of 1892, I described an improved box for optical lanterns and the like, which box was arranged and adapted to act as a portable receptacle for an optical lantern, and also as a support of the lantern when used for exhibiting slides. In this latter case, a swivelling base, attached to the box, was adapted to be carried on the head of a tripod, and, when the lantern was taken out of the box, it was placed upon a tilting board attached to the top of the box, so that the box acted as a support or stand.

"The lantern was adjusted for angular position (vertically) by raising or lowering one end of the tilting board, and (horizontally) by moving the box on its swivelling base. The two opposite sides of the box were hinged at the bottom, and adapted to be laid horizontally upon the pivoted base, and to act as supporting tables for carrying the lantern slides.

"By my present invention I construct and arrange the parts of a box, and of an optical lantern, in such a manner that the box itself forms an integral portion of the lantern or frame of the lantern, and the parts that project outside the lantern—such as the objective and the rose chimney-top—are either made to slide within the box, or be removable and adapted for packing within the box or frame of the lantern when out of use as an optical instrument. A detachable handle is also provided, so that the complete apparatus may be carried by hand in the form of an ordinary box.

"In carrying out my invention, I provide a swivelling base piece, arranged to stand upon the head of a tripod, or other suitable support, similar to the base piece referred to in my aforesaid specification. On this base piece I erect the skeleton frame of an oblong box. Two longitudinal side pieces are provided, and one is hinged to the base piece, on each side, and adapted to fit neatly into a rebate formed in the skeleton frame to receive it, so that each side is capable of being let down on a horizontal plane as a table, on about the same level as the base piece. A short sliding board carrying a vertical front board, and supporting brackets, is adapted to slide within grooves formed at the base of the front half of the box. A hole is made in the vertical front board to receive the objective or lens, which is fitted upon the same by a flange in the usual manner. The objective is thus made capable of sliding longitudinally outwards for the purpose of focussing, and inwards in order to be contained within the box when used merely as a receptacle. A vertical front slide is also provided and adapted to slide within vertical grooves in the front part of the skeleton frame, and, when placed in position, this front slide encloses the objective and its support, and forms the front end of the box.

"A vertical metal frame is firmly secured in the centre of the box so as to form a strong stay or support to the skeleton framework thereof. The metal frame is also adapted to carry the condenser, and lantern slides, troughs, or similar articles in front of the condenser for exhibition purposes. A metal groove and slide—the latter having a pin to carry the burner used—is screwed at the bottom of the back end of the box, and adapted for adjusting the position of the burner or jet with reference to the condenser. Means are also provided on the sides (at the back end of the box) to hang curtains, which are intended to enclose the light when the burner is used, and these curtains are movable, so that the burner or jet may be manipulated readily.

"Two rails are secured across the top of the skeleton framework, and form a part thereof. These are so spaced as to divide the top into three divisions of about equal dimensions. The two end divisions have grooves into which slides are fitted to close their apertures, when the box is used simply as a receptacle, while the central one is fitted within a rebate, and secured by a suitable fastening. When used as a lantern, the top back slide is removed, and the metal rose or chimney-top is inserted in its place, a short metal slide, carrying a curtain, fitting into the grooves against it, and enclosing the light at the back end of the box.

"A metal clip is secured to each of the two rails at the top of the skeleton framework, and to these a detachable handle is attached and kept in position by springs, and a vertical back slide is provided, and adapted to slide within vertical grooves in the back part of the skeleton frame, and forms the back end of the box. Suitable slide-holders are attached to the inside of the hinged side pieces, and arranged so that

when the sides are let down for use, and the box used for lantern purposes, the angle at which the lantern is tilted is compensated for by a false or bevelled bottom to the slide-holders.

"It will be understood that, on removing the slides or doors closing the orifices on the top of the box, an opportunity is given to manipulate or arrange the objective, or an article upon the science table placed on the sliding board which carries the objective, or the stage or other part of the apparatus in front of the condenser, the back orifice being for the rose chimney, as before stated; also that the optical part of the apparatus may be placed, or adjusted obliquely within the box, to avoid tilting the tripod.

"Furthermore, the improved apparatus may be used for photo-micrography."

THE ANAGLYPH AND HOW IT IS MADE.

[Photographic Society of Philadelphia.]

Ever since the first sample anaglyph was issued with the *Revue de Photographie* in 1893, these new stereoscope pictures have created a great deal of interest and curiosity, and have incited several writers to make guesses as to the manner in which they are made. Some writers have described them as a production of chromo-photography, which is an error. Their description is that of Ducos du Hauron's coloured lantern slides and transparencies, which differ greatly from his anaglyphs.

Other writers have pronounced these pictures simply a two-coloured print from one negative or half-tone plate. This is even a greater error.

To produce a stereoscopic picture, no matter in what manner it is brought before the vision, *two pictures* are required, one of these pictures to represent the view of the right eye, and the other to represent the view of the left eye. These two pictures, by superimposition, produce the stereoscopic effect of binocular vision.

The anaglyphs, which are simply improved stereoscopic pictures, require therefore for their production two images or pictures of the same object. These two pictures are obtained from *two* negatives, two reproduction plates, and two imprints.

The anaglyph does not involve, strictly speaking, a new theory, but only a new adaptation of two well-known parts, viz.—Firstly, That a colour is not distinguished or recognised when viewed through a transparent medium of a similar colour. Secondly, That an almost, if not complete, absorption or interception of light can be produced by the superposition of two transparent media of complementary colours, such as green and red, blue and orange; also that a colour will appear black if viewed through a transparent medium of its complementary colour.

From these two well-known facts, by their combination, Ducos du Hauron, among other inventions, evolved the anaglyph, by printing a two-coloured picture from two half-tones reproduced from a pair of stereoscopic negatives. One of the pictures was printed in a medium dark primary colour, and the other picture was printed over it, but out of register, in a colour complementary to that of the first picture. This two-coloured blurred picture was viewed through pieces of transparent glass of the same colour as the pigments used in the printing; seen through these pieces of plain glass held before the eyes in a proper position, the stereoscopic effect became apparent, and the anaglyph was discovered.

The two prints in the anaglyph are not exactly one over the other, but are printed somewhat out of register. This register, or overlap, varies from almost nothing to a quarter of an inch and more, depending on the subject and the manner in which the negatives are exposed.

The media for viewing these pictures are called anaglyphoscopes, and consist of two pieces of coloured glass, which may be held loosely in the fingers, or may be mounted in eyeglass or spectacle frames, or else in boards with hoods like the stereoscope. But it does not matter in what kind of mounting the glasses are held before the eyes; if the colours correspond to the pigments in the prints, the beautiful stereoscopic effect is brought out as completely with the loose pieces of glass as with the most elaborate anaglyphoscope.

These pictures possess also the great advantage over the stereoscopic pictures that they can be viewed simultaneously by a number of persons provided with anaglyphoscopes.

In the present anaglyphs the picture corresponding to the view of the *right eye* is printed with *red ink*, and will appear almost black when viewed through the *blue glass* in the right side of the anaglyphoscope, but it will be invisible to the *left eye*, which is covered by the *red glass*. Similarly the superimposed blue picture, which corresponds to the view of the left eye, will be visible to the left eye only. Thus, each eye sees only its proper picture, representing the views of the right and left eye respectively, and, not being exactly superimposed, produce the stereoscopic effect of binocular vision.

The pictures are printed out of register enough to produce the stereoscopic effect, and near enough in register to avoid double vision.

The making of anaglyphs involves a great deal of trouble, and requires the aid of an artisan whose field lies entirely outside of the photographic art; but the making of the negatives for these pictures is, however, within the scope and power of any amateur. A short description of the *modus operandi* may be of interest.

The negatives for anaglyphs are made either with an ordinary stereoscopic camera or with two larger cameras; but the larger, say 40 × 60 inch negatives, as well as smaller ones, are made best with a camera fitted on a sliding bed on the tripod.

It is not necessary to describe the working of the stereoscopic camera, which can be used for pictures up to 4 × 4 inches.

If negatives larger than that are desired, the camera on the sliding bed is preferably used, in the following manner: One exposure is made with the camera slid to one end of the bed; then the camera is slid, right or left, a distance of from three to nine inches, depending on the subject, and then *another* exposure on ANOTHER PLATE is made from this second position. Thus, steroscopic negatives of any required size can be made.

With a camera not fitted with a sliding base or bed the exposure can be made by moving the camera and tripod the required distance to the right or left, in which case care should be taken to preserve the same elevation and horizon, and to move it along an arc of a circle, the centre of which is the centre of the subject, and the distance from the centre of the subject to the camera the radius.

The distance of this lateral movement of the camera varies according to the subject. For a view in which there are several objects, planes, or angles, the displacement of the camera should not exceed three inches; but for single objects, as, for instance, a statue of a single figure or a portrait of a person, the lateral displacement may be increased to nine inches, in which case two cameras side by side, with the lenses nine inches apart, could be used simultaneously.

From the negatives thus obtained strong half-tone plates or reproductions are made, from which the anaglyphs are printed in a letter press.

The clearness of the picture depends largely upon the quality of ink used in the printing, as well as upon the finish of the surface of the paper on which they are printed.

A recent letter from the inventor informs the writer that the anaglyphic lantern slides have been perfected, and that samples of them will be forwarded to this country ere very long.

In conclusion, is may be mentioned that the claims for the use of the anaglyphs include with the photographic reproductions also paintings painted, woven and printed articles, such as ceilings, carpets, wall papers, and cuts which are enlarged or copied from anaglyphic patterns. This process of stereoscopic effect was patented in the United States last August.

A. F. Watch.

IMPROVEMENTS IN KINETOSCOPES.

Messrs. John Anderton, of Birmingham, and Alfred Lomax, of Blackpool, thus describe their improvements in kinetoscopes:—

"The Edison kinetoscope, as at present constructed, and as generally used, is an apparatus constructed in the form of a cabinet, about the size of a slot phonograph cabinet, and oblong in its general shape. It contains a mechanical device operated by electricity, which is so constructed as to run the film containing the photographed views past a given point at a speed of about forty-six each second of time. In the top of the cabinet, which is that of a square and flat plane, and at one corner of the same, is a small window covered with clear glass. The person who desires to witness a reproduction of the views looks down through this window, and the film passes before his eyes with such rapidity that he beholds one continuous view. The general object of the kinetoscope is that of, and for, entertainment, though it may be put to several other valuable uses. The general use and purpose of the kinetoscope is obviously to enable a person to see, owing to the aid of very rapid photography when preparing the films, a picture in such a way and manner as to present all the natural and accurate movements of life.

"Owing to the fact that, as at present constructed, only one person at one and the same time is enabled to see the view operated by the kinetoscope, this has been found to be a serious disadvantage to its general and profitable use, especially when employed for the purpose of exhibition. It is proposed, therefore, in the present invention to effect such improvements (which will be more particularly described hereafter) as will enable several persons to see the same view without inconvenience at one and the same time. It may also be described as an addition to the kinetoscope.

"In the Edison kinetoscope the film of photographs is about six inches below the top of the outer case containing the machinery for moving it in a horizontal direction, and immediately above the moving film a plano-convex lens is placed for the purpose of magnifying the photographs upon the film. The lens is in a setting, and is placed in a perpendicular aperture. The present addition consists of a mirror or mirrors, or prism or prisms, and lens or lenses, in the manner herein described. Above the perpendicular aperture, in the outer case of the kinetoscope already referred to, we place a plain reflector of glass, metal, or other material—if of glass, it is preferably silvered upon its front surface; or a prism of glass or other material may be used, of angles suited to the purpose. For example, a prism of 90° angle at apex, and 45° angle at each corner of its base, may be used, and this can be silvered on its base for increasing the brilliancy of its reflections; or a prism can be utilised that will give a total reflection. We take, for example, the right-angle prism referred to, and place it above the aperture in the case of the kinetoscope, and in such a position that one of its sides is parallel

to the film below. The other side, being a right angle to the first, will therefore be vertical, and, as the angles at base are of 45°, the base will be at this angle to the film, and the images of figures upon the film will be seen by the observer or observers, not in a vertical but in a horizontal direction, *i.e.*, immediately in front of him or them. The prism is of sufficient size to reflect the whole of a single photograph on the film when magnified, and is of sufficient length to enable an observer not situated immediately opposite to see the reflection.

"If a plain reflector be utilised, instead of a prism as described, it is placed at, or about, an angle of 45° to the film.

"The prism, or plain glass, or other reflector, is suitably mounted so as to allow of a little motion, in order that observers of different heights may see the reflections without inconvenience.

"A convex lens or lenses, or lenses of any other suitable form, may be placed between the film or figures and prism or mirror, or between prism or mirror and observer or observers, for the purpose of magnifying the figures on the film. The prism or mirror is placed over the aperture in such a position that the reflected image of the figure or figures on the film will appear in their proper positions, that is, not inverted; the figure or figures in this case, when viewed directly without reflection, are seen inverted, or the same effect may be attained by reversing the kinetoscope film. A frame or other arrangement encloses the prism or reflector, and may be covered with dark material or paint for the purpose of excluding extraneous light and directing the eyes of observers to the reflected images."

ACETYLENE GAS.

THE most complete and accurate information yet given out concerning the new acetylene gas is probably contained in the recent report from the Ontario Bureau of Mines. The report states that the process for the economic production of calcium carbide and acetylene is the most promising discovery that has been made in recent years for the supply of light and fuel.

The inventor, Thomas Leopold Wilson, says the *Canadian Photographic Journal*, is a Canadian. The materials used are common lime and carbon—in any form—hard or soft coal, coal dust, petroleum, tar, or peat. These are treated in an electric furnace, and Mr. Wilson is confident that, where electricity can be generated with water power, the cost of manufacturing calcium carbide brings it easily into competition with other materials from which fuel and light are obtained, and that a plant erected near a great water power like that of Niagara Falls will supply a continent at a figure with which coal gas cannot compete. The power of Niagara is ample for almost any conceivable requirement, while it is alongside a mountain of limestone, and coal dust or culm can be had at little more than the cost of hauling from the mines of Pennsylvania and Ohio. Arrangements are already being made to procure electrical energy for this purpose from the Falls on both sides of the Niagara River from the Company which controls the power franchise at the Falls; so that it is probable that the carbide will soon be manufactured on a commercial scale in both the United States and Canada.

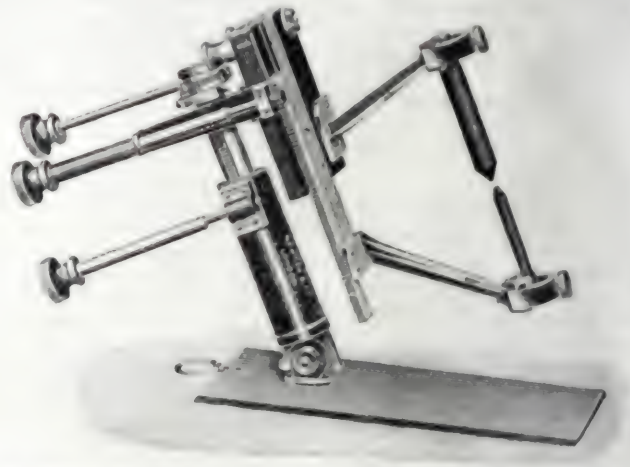
The carbide, containing forty parts by weight of the element calcium, which is the basis of lime, and twenty-four parts by weight of carbon, will be cast direct from the electric furnaces into rods, or cylindrical cartridges. One of these, twelve inches long and one and a quarter inches in diameter, will weigh a pound, and render five cubic feet of gas when simply subjected to the action of water, which is allowed to drip upon it slowly from a pipette or dropping tube. The oxygen of the water combines with the calcium of the carbide to form lime, while the hydrogen of the water unites with the carbon of the carbide to form acetylene. Owing to the great richness of the gas, it can only be used in flat-flame burners, in which it emits a light greater than any other known gas, its illuminating value, figuring on a consumption of five cubic feet per hour, being no less than that of two hundred and forty candles.

Professor Lewis asserts that the calcic carbide can be produced in the United States for about twenty dollars per ton, and the beautifully pure lime obtained by the decomposition would net, as a by-product, two and a half dollars per ton.

The possibility of liquefying acetylene by moderate pressure permits enormous volumes of gas to be compressed into the liquid state in small wrought iron or steel cylinders, from which it may be fed slowly through burners. This quality promises to make it of the greatest possible value for floating buoys, and also for portable lamps, where there is no ordinary gas supply. In this way it would take the place of the illuminating products of petroleum, and thus off-set the alleged exhaustion of the oil fields. In that event, the value of the new discovery might be so great as to be beyond computation.

NEWTON'S "UNIVERSAL" ELECTRIC HAND-FEED ARC LAMP.

THIS lamp is the latest introduction of Messrs. Newton & Co., of 3, Fleet-stree[illegible]. As its name implies, it is of universal application, being so arranged as to work with continuous as well as with alternating current, and care has also been taken to so construct it, that it is convenien[t] spectrum work either in the lantern or on the laboratory table; sp[ecial] carbons are supplied for showing spectra of refractory metals, and als[o] reversal of the sodium line, which, with this arrangement, can accomplished with ease and certainty.



In the illustration the lamp is shown adjusted for alternating curren[t]. No tray is required, as all the necessary motions for centering are pr[o]vided in the lamp itself. The three milled heads shown projecting fr[om] the back of the lamp enable the carbons to be fed and the arc adjust[ed] up and down and from right to left, from outside the lantern.

A METHOD OF STEREOSCOPIC PROJECTION.

[Scientific American.]

EXHIBITORS of lantern views have often made attempts at relief effects o[n] the screen. Such attempts necessarily fall short of true relief on accoun[t] of the neglect of the fundamental fact of binocular vision, namely, tha[t] two slightly different views must reach the two eyes separately. N[o] manipulation of the lanterns or the screen can get around this psychologica[l] law.

Having promised to deliver a public lecture on binocular vision, i[t] occurred to me that, unless I could show actual pictures in relief to the audience, the lecture would be folly of the worst kind. To escape from the quandary, I sought a method of stereoscopic projection, and found it.

In the first place, it is necessary to be able to present pictures to the two eyes separately. Spectacles of coloured glass, with a particular red for the left eye and a particular green for the right eye, can be arranged so that green light of a definite colour cannot get into the left eye, and red light of a definite colour cannot get into the right eye, whereas each can get to the eye having a glass of the same colour.

In the next place it is necessary to present the pictures in the aforesaid green and red lights. This is done by using two lanterns, one throwing green light and the other red light.

In preparing for an exhibition various details must be attended to. The coloured glasses are made from the standard red and green glass used by railways. When a piece of red is placed over a piece of green, no light ought to get through. The faint brown light that actually does get through has no appreciable effect. This is the way in which I test the glasses. I first select several squares of red and several squares of green that together permit only a faint light to go through them. This eliminates a very disturbing kind of glass made for railways by some manufacturers. To the eye it differs very little from a true red, but it lets nearly all the green rays through. Then from the red squares I reject all that are too deep in colour; otherwise the light of the lantern is so much weakened as to be scarce visible to the audience. Finally, for limelight lanterns, I select a very light (thin) red square and a moderately dark (thick) green one, and, for electric lanterns, a light red one and a very dark green one. These squares are inserted behind the slide-carriers and in front of the condensers. The green square sometimes cracks from the heat; therefore several should be kept ready.

In regard to the spectacles, I adopt the following procedure: For economy's sake I use merely two pieces of glass about one inch square, held before the eyes with the two hands. Eyeglasses with the two glasses can be obtained for about $13 per hundred; spectacles for about $15. By a little manœuvring, the plain coloured squares can be obtained for about $1 per thousand. The "manœuvring" consists in buying refuse chips where railway signals are being made. An understanding with the glass-cutter will cause him to throw into one keg all the green chips, and into another all the thin red chips. These are afterwards cut into small pieces. The red pieces must be sorted. A sheet of green is supported on two blocks above a white surface; the red

are scattered over it, and all which let through the green light (the ar red referred to) and all that are very dark are rejected.

m the stereoscopic negative two lantern slides are made, one from nalf. The picture intended for the right eye is placed in the green n, that for the left eye in the red lantern. Both are thrown ıer on the screen. When the spectacles are held before the eyes, mage for the right eye is selected by the green glass, and that for ft eye by the red glass. The two pictures thus reach the eyes and rain separately. The result is an actual relief.

e relief appears just as real as a real object. This is necessarily the

For example, in looking at the room in which you sit, each of your yes receives a different picture, as can be proved by closing one eye at a

When two such views are projected upon the screen, and are then n to the eyes separately, the result must be exactly the same as e—the relief must be just the same as if the room were actually

With one exception, however, the pictures seen by my method ar in lights and shades, the colours being lost.

ıis reality of the pictures cannot be understood by persons who have seen pictures in the stereoscope. There the result is a minute f model. A like effect happens by my method when the screen is small for life size. A view of the Brooklyn Bridge, for example, ears like a model; but, when the pictures are life size, the observer s it hard to believe that, for example, he cannot actually advance ıg the shaded roadway before him, or step into the boat waiting on shore, or pat the dog that greets him, &c. The things he sees are, arently, real objects.

he method is, as far as I am concerned, original. It is also, as far as n learn, new, although it seems hard to believe that such a simple ıciple has not already been discovered a dozen times over.

The possibilities of this method in combination with the strobo stereo- pic pictures, such as are used in Edison's kinetoscope, are limitless. proper arrangements the two sets of pictures of the kinetoscope might projected in two colours to the same spot on the screen. They would separated by the coloured spectacles, and would be seen as real objects. projecting life-sized pictures on a screen in front of a theatre stage, hole play might be given apparently on a real stage. As long as the ctacles are kept on, the audience could not tell the difference from an ual stage except for the lack of colour. Edison, dreaming of such a ssibility, believes that in coming years, with the aid of the phonograph, rand opera can be given at the Metropolitan Opera House at New rk without any material change from the original, and with artists d musicians long since dead." There is no possibility, however, of the ief effect being accomplished unless the two pictures are gotten to the o eyes separately by some such method as I have described.

These is, finally, one very important application for my stereoscopic ethod. With very large classes the details of scientific apparatus are visible to all except a few. The usual remedy is to throw a photograph the screen. Being a flat view, the student cannot understand it, d cannot become interested in it so well as if he viewed the real thing. Suppose, for example, the lesson is on the graphic method of recording me. The instructor sets up the chronograph, &c., and takes a stereo- opic view. The stereoscopic slides are made and projected. Each udent then sees, by my method, an apparently real chronograph, ten to venty feet long.

Or suppose the lesson is on the general anatomy of the brain. Various ssections and preparations are made and photographed stereoscopically. he students can then see actual solid brain preparations twenty feet in iameter. As the size of the human brain makes efficient instruction mpossible to classes of more than twenty students, the gain is evident.

For the benefit of persons interested in psychology, I have gotten up wo sets of ten views each, which illustrate the laws of binocular or tereoscopic vision. With the limelight these can be made plain to udiences or classes of 200 persons; with the electric light, to an un- imited number.

My particular interest in the stereoscopic method lies, of course, in its edagogical applications; but it is easy to foresee what it might do in he hands of a popular lecturer.

E. W. Scripture.

THE ASTRONOMICAL CAMERA AT THE SYDNEY OBSERVATORY.

The very important part which photography is now playing in the extension of astronomical knowledge, and the power the astronomical camera has in producing accurate and permanent pictures of what can be seen with the aid of the telescope, and also of star fields far beyond the reach of the telescope, says *The Australian Photographic Journal*, is one of the most remarkable scientific developments of the present day.

The delay in taking advantage of this great aid to astronomy is also remarkable, for its power was demonstrated by Professor Bond in 1850, using the fifteen-inch refractor at Harvard College Observatory. In 1857, Sir G. B. Airy, the late Astronomer Royal of England, speaking of one of Bond's star photographs, then recently taken, said: "This photograph marks a step of very great importance, of which it is at present impossible to estimate the value." In 1858 De la Rue, with a reflector, made with his own hands, succeeded in making stellar and lunar photographs, of far greater accuracy and beauty, both of the moon and stars, than any that had been taken before, and his moon photographs are not easily beaten even to-day.

Strange as it may seem to-day, that knowledge of the power of astronomical photography lay practically dormant for thirty years, until the conference of astronomers in 1887 agreed to unite forces and use it as a means of charting exactly the whole heavens. That conference agreed that, in order to secure uniformity in the photographs of the heavens, all the cameras to be used should be of the one size, *i.e.*, 13$\frac{1}{3}$ in. in diameter, and 11 ft. 4 in. in focus; and that the size of the plates should be 6$\frac{1}{4}$ × 6$\frac{1}{4}$, taking in a portion of the heavens measuring 2° on each side, *i.e.*, 4 square degrees. So much being agreed upon, it was left to each astronomer to have whatever kind of mounting or stand he pleased, provided it was equal to the work. Quite a number adopted the ordinary form of equatorial mounting, in which the moving parts of the instrument are made to work on, and are balanced upon the top of, an iron column. This system, while it possesses some conveniences in working, has two very great disadvantages: (1), the time during which a plate can be continuously exposed is limited by the iron pier coming in the way of the lower end of the camera as it swings round, and (2) it is especially liable to vibration, because all the heavy parts are balanced on top of the column, and free to vibrate; and, if vibration is bad in an ordinary camera, it is tenfold more so in a long one, which has to depict clearly the smallest round specks of light.

These drawbacks induced Mr. Russell to adopt the form of mounting shown in our illustration of the Astronomical Camera at the Sydney Observatory, in which it will be seen that the camera is hung on an axis supported by two massive girders which are united at the ends and by means of bearings in the centre of these ends it can be freely turned round. This is one of the oldest forms of mounting a telescope, and it entirely removes the two drawbacks found in the other form of mounting already referred to, for the telescope has no central pillar to hinder its free motion, and the weight is supported at the two ends of the main axis, which can be made as heavy and rigid as necessary. Advantage was taken of this in the Sydney mounting, and the moving parts weigh two tons. Of course, such a mass of metal requires very much more to set it vibrating than a lighter mass, and, if set vibrating, it ceases in a moment. To this Mr. Russell attributes in a great measure the great success of his photographs. Properly made, as the Sydney instrument is, the great weight is no inconvenience in moving it about. It is, of course, possible, with suitable screws, &c., to move the telescope by hand, and make it follow a star; but a clock to move it adds greatly to the success of the Astronomical Camera, and such a clock in the Sydney instrument carries it with extreme regularity, pointing to the star.

Of course, no clockwork can provide for varying refraction or speks of sand getting into the moving screws; and, as these two sources of error are always in evidence, it is necessary, in all astronomical cameras, to have what is called a guiding telescope, that is, one attached to and pointing to the same spot as the camera. By means of this telescope the motion of the instrument is watched, and suitable means are provided by which the effect of a piece of sand or dirt, not more than a ten-thousandth part of an inch thick, at the large wheel, can be seen and instantly corrected, without exerting more force than can be given with one finger. Excepting the lenses and large wheel, this instrument has all been made in Sydney.

There is an impression that astronomical photography is difficult photographically, but Mr. Russell assures us this is not the case. In exposure you have to consider white and black, that is, bright stars and dark sky, and in development your object is to bring these out as they are in nature. It is a case of contrast, only black and white.

It is true that there are serious difficulties, sufficient to try one's patience and perseverance, but these are not photographic, nor mechanical, nor optical defects, but they are due to the atmosphere, which we cannot control.

Often, when the sky is black and the stars are brilliant and twinkling, and it all looks so promising, the astronomer, who would do fine work, must cover up his telescope, because the stars are dancing about; that is, when you look through the telescope, the star is in a state of rapid motion from side to side. This is due to the mixing of currents of air of different temperatures, and the varying refraction which such mixing produces. The effect amounts often to making the star move about its own apparent diameter, so that the light of the star by this motion is scattered over a spot which is twice the diameter it would have if there were no vibration; in other words, it would only be one-quarter as bright, for twice the diameter means that the light is spread over four times the area, and it would take four times as long to record itself on the plate. Sometimes this vibration is so bad that the stars' light is scattered over a space three times the diameter of the star spot, and would therefore take nine times as long to photograph; of course, such an extension of time is prohibitive, not only because of its length, but also because the star image has no hard outline, the star light not being evenly distributed over the spot. The effect of vibration of the star images, or what is technically known as *bad definition*, is, as stated above, to increase the sizes of the star images on the plate; but, unless it is very large, it is not serious, because the star image remains round even when so enlarged. If, however, there be a cluster of stars, enlargement due to bad definition

may cause the star images to coalesce on the plate, simply by this enlargement of the individual images. Now, in viewing the moon, we see main features, mountains and plains; but, when we come to look for detail, we find it made up of small details, lines or spots of shading, which, on a night of good definition, bring out the wondrous mass of detailed features of the moon. They are, for the most part, small, and the effect of bad definition on a photograph of the moon will be to make all the surface vibrate about, exactly as it does the stars, and from this cause they overlap on the plate, and all the wealth of fine markings in detail is obliterated. There are comparatively very few nights in a year when the atmosphere is favourable for photographing moon or planets, simply from the atmospheric defects above described.

Yet Mr. Russell has been most successful in obtaining some of the finest stellar photographs that have yet been produced, and thus proving that astronomical research as conducted by ordinary telescopic observation gives a most meagre idea of the infinity of space. This fact is fully proved by photographs of various "star clusters" that have been taken. In one of these, in the "Milky Way," which through Herschel's large telescope showed 192 stars, a plate exposed for one hour produced a negative on which 350 stars were clearly depicted, while another plate, exposed for five hours on the same cluster, distinctly showed 14,551 stars on the plate. Another star cluster has been successfully photographed that is so far distant from this earth that it is estimated 90,000 years would be required for the light from the stars there located to reach us, the mass, as at present shown on the negative, being so dense that it is impossible to estimate the number.

FLASHLIGHT WONDERS.

Naturalists have been doing some clever things by the aid of photography. A Western sportsman has been for years making a collection of photographs of all kinds of wild animals in their native haunts, and many of these pictures, especially of animals about to spring at their intended prey, have been taken under conditions that made the skilful handling of the rifle highly necessary the instant after the camera was snapped. Another enthusiast has devoted himself to photographing the animals of the forest in their nightly wanderings. He would set a wire in the path of the animal he wished to photograph and adjust the camera so that, as the animal came along and made contact with the wire, blitz pulver was ignited, and in the flash the picture was taken. In this way some beautiful specimens of deer in all sorts of attitudes, of mountain lion, badgers, opossums, etc., have been secured, and many new features have been developed of great interest to the naturalist. M. Bontan, the European naturalist, who studies the wild life of the Mediterranean in the garb of a diver, has succeeded in taking some photographs of the sea bottom. He uses a flashlight obtained from a spirit lamp and magnesium powder, which is covered by a water-tight bell jar. The lamp stands on a barrel containing oxygen gas, which he employs to work the lamp and the pneumatic shutter of the camera. He breathes through the supply pipe of the diving dress. The camera is water-tight, and stands on a tripod near the barrel, so that the shutter and the flashlight can be worked together.

The Latest Flashlight Powder Explosion.—Our attention has been called by a subscriber to a most distressing flashlight powder explosion which occurred early in October in Denver, Col. According to an account in the *Denver Republican* a photographer by the name of Jack Ross, twenty-nine years old, a native of Hillsburg, Cal., finding business rather unprofitable in Denver, undertook the manufacture, on a special order for another photographer there, of three pounds of a magnesium flashlight compound, after a formula said to be his own. He was two days at work on it, and was in the act of putting the powder up in bottles when suddenly a terrific explosion occurred, knocking him down insensible to the floor, setting fire to his clothes, and blowing out a portion of the building. It was with difficulty that the fire on him was extinguished; he was able to say, before relapsing into unconsciousness: "I was putting flashlight powder in bottles. There were three pounds of it on my bed. It's very dangerous, and when I stooped to handle it there was an explosion. I don't remember anything but the flash." He was carried to the hospital in an ambulance; the physicians thought his chances of recovery were slim. Our correspondent, John T. Davidson, M.D., of Denver, writes as follows: "The enclosed clipping containing account of an accident occurring here recently, may serve as a basis for an article upon the danger of flashlight powders containing chlorate potassium. Ross, it seems, was quite a novice in photography, and was mixing a compound containing chlorate of potassium in addition to magnesium powder, with the result stated. It cannot be too strongly impressed upon dabblers in chemistry that we have in potassic chlorate a salt which is prone to explode upon slight provocation; the danger in keeping flashlight powders on hand which contain this agent is not inconsiderable, and it seems to me that the *American Amateur Photographer* will do a good work in disseminating a little information among those who are not chemically posted." As is generally known, chlorate of potassium and picric acid are frequently employed in combination with magnesium powder for the purpose of supplying an abundant amount of oxygen to quickly ignite and burn the powder, and when such a compound is ignited, a miniature puff or explosion takes place, but the quantity is so small, that it is not generally dangerous. Compounds of this character will not bear sudden jars, and will ignite if pounded, particularly when a sliver of wood or other combustible material happens to be mixed in with it. It is probable something of this kind occurred when he was packing the powder in the bottles. We caution those who sell and those who use flashlight compounds to handle them sparingly, and as far as possible get along with plain magnesium powder projected through or into an alcohol flame. Just as good a light can be obtained, and the element of danger is greatly diminished. After all, it is only the burning magnesium that produces the light. Numerous good devices have been invented for that purpose, and are more to be relied upon than the dangerous compounds. We hope this incident will be the means of making all future users more cautious.—*American Amateur Photographer.*

The Limelight for Process Work.—Another kind of illuminant we have tried is the limelight. For direct copying it is admirable, convenient, and fairly cheap, but for half-tone work with the screen and wet collodion it is rather too slow to be economical, if much work is to be done. We have lately been again investigating its possibilities of usefulness for the small worker, and, with certain modifications of the jet, we have succeeded in securing a fairly powerful illuminant, which will be very useful, now that dry plates for process work are coming into vogue. Our experiments in modifying the jet and other arrangements are not complete, and we hope to get still further actinic power. However, we may record results so far. The jet is of the blow-through form, which is a guarantee for safety to the timorous, but we have arranged the nipples so that it has practically all the advantages of the mixed jet in the matter of more light. The oxygen cylinder costs 4*s.* 2*d.* to fill, and will last continuously for about four hours; but, by focussing with an incandescent gas burner, and only using the oxygen for the actual exposure, it will serve for a considerable number of exposures. The jet has an automatic cut-off for turning down the light when not in use without turning it out altogether. It is very easy to get the cylinder recharged here in London; all one has to do is to send it to the nearest agent of Carter, Paterson & Co., the carriers, the remittance to Brin's Oxygen Company, and next day the cylinder comes back charged. With the precautions now adopted by the Brin Company, there is no more risk with a cylinder than there is from the likelihood of an explosion of house gas or a deadly shock from an electric-light cable. Now as to results: With Ilford process plates, copying direct line work same size with a rapid symmetrical at *f*-8, the exposure is three minutes, giving a crisp, dense negative. Half-tones take from twenty minutes to half an hour and more, the interposition of the screen and the necessity of using a comparatively small stop tremendously in creasing the exposure. But, by eking out poor daylight with five or ten minutes of the limelight, very satisfactory work can be done. If we can succeed, as we expect, in getting more actinic value out of the light, it will be a most useful apparatus for small workers.—*Process Work.*

Messrs. Newton & Co., of Fleet-street, are making the electric arc lamps for use at the Drury Lane pantomime, for throwing coloured lights, in place of the limelight boxes.

Manchester Photographic Society.—The second Lantern Meeting of the present session was held in the Society's rooms, 36, George-street, on the 27th ult. The President (Mr. H. M. Whitefield) introduced the lecturer, Mr. J. Hyde, to a large gathering of members and friends. The subject of the evening was *Switzerland and its Glaciers*, and Mr. Hyde, in his introduction, spoke of the pleasures of present-day travel. A ticket is taken at one of the principal tourist agents', which carries the holder from Manchester through Switzerland and back to his starting point for anything between twenty and fifty pounds. The rail is taken *viâ* London to Newhaven and the steam packet to Dieppe, a striking slide being shown looking down upon the deck of the steamer while at sea. The train is then taken to Paris, where time is given for a sight of the many places for which the French capital is noted. There were shown, amongst others, slides of L'Eglise des Invalides, Arc de Triomphe, and the Cathedral of Notre Dame. Travelling by way of Basle and Schaffhausen, with its noted Falls, Lucerne is reached, where the Rigi Mountain is visited. The chief beauty of the slides lay in the clearness with which the distant mountains were depicted, especially in the views of the Bernese Oberland. From Lucerne the route lies by Meyringen and the Reichenbach Falls to Interlaken, from which place the excursion to Grindelwald and its glacier is made. Thun, Berne, and Lausanne, on the Lake of Geneva, were each depicted on the screen. But haste is made to the mountains, where, in imagination, the audience were taken to the summit of Mont Blanc. Twelve views were shown, from base to summit, describing more graphically than words the perils of Alpine climbing. After visiting the Hospice of St. Bernard, the journey to Paris was made, and so home. The slides were by M. Ferrier, of Paris, and Mr. Hyde gave his lecture in a manner which brought his hearers into closer touch with the wonderful nature which lies in that small country of Switzerland.

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